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

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

August 25, 2015

Exemption No. 12595
Regulatory Docket No. FAA−2015−2413

Mr. Ernest Conover
dba Down to Earth Aerial Videography
1408 North James Street
Rome, NY 13440

Dear Mr. Conover:

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 April 25, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Mr. Ernest Conover dba Down to Earth Aerial Videography (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography, videography, mapping, and surveying for real estate, advertising, marketing, and insurance purposes.

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

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

Airworthiness Certification

The UAS proposed by the petitioner is a DJI Phantom 2 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 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, Mr. Ernest Conover dba Down to Earth Aerial Videography 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

[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.

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. Ernest Conover dba Down to Earth Aerial Videography 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 + 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 August 31, 2017, unless sooner superseded or rescinded.

Sincerely,

/s/
John S. Duncan
Director, Flight Standards Service

Enclosures

Down to Earth Aerial Videography

April 25, 2015

U.S. Department of Transportation
Docket Management System
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Washington, DC 20590

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Re: Exemption Request for Ernest Conover d/b/a, Down to Earth Aerial Videography. Under Section 333 of the FAA Reform Act and Part 11 of the Federation Aviation Regulations.

Dear Sir or Madam:

Ernest Conover d/b/a, Down to Earth Aerial Videography, seeks exemption from several provisions of the Federal Aviation Regulations (FAR's) in accordance with Section 333 of the FAA Modernization and Reform Act and 14 C.F.R. Part 11of 2012.This exemption will permit Ernest Conover d/b/a, Down to Earth Aerial Videography to operate an Unmanned Aircraft System (UAS) for commercial purpose of conducting aerial acquisitions within the National Airspace System.

Exemptions requested

14 C.F.R. Part 21; Subpart H

14 C.F.R. 45.23 (b);

14 C.F.R. 61.113 (a) & (b);

14 C.F.R. 91.7 (a);

14 C.F.R. 91.119;

14 C.F.R. 91.121 (a);

14 C.F.R. 91.151 (b);

14 C.F.R. 91.405 (a);

14 C.F.R. 91.407 (a)(1)

14 C.F.R. 91.409 (a)(1) & (a)(2)

14 C.F.R. 91.417 (a) & (b)

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Summary

Ernest Conover d/b/a, Down to Earth Aerial Videography, seeks these exemptions in order to operate a UAS DJI Phantom 2 Vision + safely for commercial hire to collect photographs and video for the purpose of mapping that will be utilized in (Geographic Information Systems) GIS and (Computer Aided Design) CAD platforms. This imagery will be used to create Ortho-Mosaics and further develop (Digital Surface Model) DSM, (Digital Terrain Model) DTM or (Digital Elevation Model) DEM. Photographs and video will also be taken for several purposes listed below and to advance business economic growth in the community.

- Resorts and Recreational areas
- Land Development GIS & CAD (DTM,DEM,DSM, Ortho-Mosaics)
- Real Estate (Photographing & Videotaping)
- Advertising and Marketing
- Aerial Inspections
- Insurance Claims

Glossary of Abbreviations

AGL	Above Ground Level
ATC	Air Traffic Control
CAD	Computer Aided Design
DEM	Digital Elevation Model
DSM	Digital Surface Model
DTM`	Digital Terrain Model
FPV	First Person View
GCS	Ground Control Station
GIS	Geographic Information System
GPS	Global Positioning System
IMU	Inertia Measuring Unit
NAS	National Airspace System
PIC	Pilot in Command
RTH	Return to Home
UA	Unmanned Aircraft
UAS	Unmanned Aircraft System
VLOS	Visual Line of Sight
VTOL	Vertical Takeoff & Landing

The Unmanned Aircraft System

Down to Earth Aerial Videography is committed to operating a small UAS safely, protecting the environment, and minimizing the risk to the NAS, persons and property on the ground. The UA that I will be operating is a DJI Phantom2 Vision+, Serial # PH645475246, a small ultra light UA weighing just less than 3 pounds. The maximum flight time of the Phantom 2 Vision+ is approximately 25 minutes, although flights will be limited to 20 minutes from takeoff to first point of landing, leaving 5 minutes in reserve. The GPS enabled UA stabilizes the quad-rotor when the compass is properly calibrated and six plus satellites are available. It is important to note that no take-off procedure will be implemented unless at least six satellites are available. The compass reads geomagnetic information, assists the GPS to accurately calculate the position and height of the UA, and has an Inertia Measuring Unit ("IMU") built-in that measures both attitude and altitude. The Phantom2 Vision+ is a quad rotor measuring 12"W x 12" L x 7" H, driven by a lithium polymer battery and is equipped with a 3-axial gimbal and a 14 megapixel 1080p camera capable of geo-referenced photographs and video. For each mission scheduled and practice runs, the Phantom2 Vision+ UAS will be checked against the most current software update and visually checked by the PIC to ensure that the UAS is safe for flight and weather permitting. Additional flight maintenance and inspection information is also available in the Phantom2 Vision+ User Manual submitted with this application. Before each flight, a Phantom2 Vision+ Pre-flight "Mission Checklist " will be performed to ensure that each flight is consistent and all safety measures are in place.

The 14 megapixel 1080p video camera will be transmitting a 2.4 MHz Wi-Fi signal to an Iphone or tablet running Ground Control Station "GCS" Phantom2 Vision+ applications. The controller that communicates with the Phantom2 Vision + operates on a 5.8 GHz band and is FCC compliant

The Unmanned Aircraft PIC

I, Ernest Conover, d/b/a Down to Earth Aerial Videography will be the only PIC directly responsible for the safe operations of the UAS and will be in Visual Line Of Sight "VLOS" at all times and will fly during daylight hours only. A Phantom Pilot Training Manual has been submitted and completed by myself to ensure proper operation of the UAS. I have been a hobbyist aircraft operator for about two years, have logged in 30+ hours of flight time and I am versed in the operations and the safety aspect of the sport. With respect to the operations of a quad-rotor, approximately 15 hours of flight time on the Phantom 2 Vision+ and similar DJI Phantom FC-40 UA have been logged in, maneuvering in lower elevations and around obstacles for more precision and safer flights.

The Operation of the Unmanned Aircraft

Ernest Conover d/b/a/, Down to Earth Aerial Videography, seeks these exemptions in order to operate a small UAS DJI Phantom 2 Vision + safely for commercial hire to collect photographs and video for the purpose of mapping that will be utilized in (Geographic Information Systems) GIS and (Computer Aided Design) CAD platforms. This imagery will be used to create Ortho-Mosaics and further develop (Digital Surface Model) DSM, (Digital Terrain Model) DTM or (Digital Elevation Model) DEM. Photographs and video will be taken to spur Economic & Community

Development of Resorts and Recreational Areas and safer inspections for Insurance Claims where adjusters may be exposed to dangerous situations.

A maximum height of 200 feet will be set through the use of DJI Naza software that uploads to the UA and prevents the Phantom from exceeding the elevation setting. Most flights will be operating in the recommended vertical range of 150 feet Above Ground Level "AGL" for the purpose of taking overlapping photos that will be used in photogrammetry and the development of Ortho-Mosaics, DEM, DTM and DSM. The maximum speed of the Phantom 2 Vision+ is 30 knots. For purposes of photogrammetry and most flights, the UA will be operating around 10 knots in horizontal flight.

For safety purposes, the UAS is equipped with "Failsafe Mode" that allows the "Return to Home" hover 66 feet and land at the point off takeoff when either of the conditions are present:

(1) The remote control is powered off
(2) The Phantom has flown out of effective remote control range
(3) The signal between the Phantom has been blocked
(4) There is interference causing a signal problem with the remote control

The small ultra light UA will always fly in Visual Line Of Sight (VLOS), during daylight hour's and stays certain distances away from airports or heliports as described below:

- 5 Nautical miles (NM) from an airport having an operational or control tower;
- 3 NM from an airport with a published instrument flight procedure, but not an
- operational tower; or
- 2 NM from an airport without a published instrument flight procedure or an
- operational tower; or
- 2 NM from a heliport with a published instrument flight procedure

The DJI Naza software will be used to keep the UAS updated for peak performance and reliability. As Naza software updates become available, I will be updating the Phantom 2

Vision+ flight system and performing inspections of the UAS to ensure that it is in good condition for safe flight. Prop guards will be a top priority and examined thoroughly to ensure no cracks have developed. I will do minor repairs and if needed, advanced repairs will be done by a certified DJI Certified Repair Station. All maintenance and repairs will be documented in hard copy and backed up in digital format. A higher level of safety with additional information concerning the UAS operations, maintenance and specifications may be obtained in the Phantom 2 Vision+ manual which is enclosed with this application. A Phantom 2 Vision+ preflight checklist will be utilized prior to operating the UAS. I am confident that the level of safety that I will present and the size of the battery operated Phantom2 Vision+ would be far greater than a full sized aircraft carrying a minimum of one pilot and large amounts of fuel flying over populated areas in the NAS.

Benefit to the Public as a whole

I am currently a member of the New York State Geographic Information System Association "NYSGIS" dedicated to collecting geospatial data from our surroundings. A great emphasis has been put forth processing elevation information for the development of Digital Terrain Models, Digital Elevation Models and Ortho-mosaics to better understand the "Lay of the Land". This information can be used to identify several aspects of impervious surfaces and how they affect precipitation runoff into our collection systems or the lack of. This not only helps the community with flood events but also helps FEMA in their data collection of information in crucial areas.

In the past, the only way to collect large areas of elevation information in remote areas was to hire an aircraft with very sophisticated and expensive equipment. This in

turn cost a great deal to communities and in most cases, was not affordable. With the use of a small unmanned aircraft collecting photographs and used in photogrammetry, this not only becomes affordable, but also makes the skies safer without the use of full size aircraft flying over communities, carrying large amounts of flammable fuel, endangering pilot and passengers onboard and emitting exhaust fumes into our NAS. In addition, the use of an UAS for the purpose of aerial inspections, advertising and marketing, real estate aerial photography and videography has made it affordable to smaller businesses that would not be able to afford these services in the past with conventional aircraft. This will spur Economic and Community Development.

Rules that need exemption

14 C.F.R. Part 21; Subpart H

Airworthiness Certificates sets forth requirements for the procurement of necessary airworthiness certificates in relation to FAR 91.203(2a)(1). The size, weight and enclosed operation area of my UAS permits exemption from Part 21 because my UAS meets and exceeds an equivalent level of safety pursuant to Section 333 of the Reform Act. The FAA is authorized to exempt UA from the airworthiness certificate required under both the Act (49 U.S.C 44701 (f) and Section 333 of the Reform Act. Both pieces of legislation permit the FAA to exempt UAS's from the airworthiness certificate requirement in consideration of the weight, size, speed, maneuverability and proximity to areas such as airports and dense population. My UAS meets and/or exceeds each of the limits as set forth.

§45.23 Display of marks.

(a) Each operator of an aircraft must display on that aircraft marks consisting of the Roman capital letter "N" (denoting United States registration) followed by the registration number of the aircraft .Each suffix letter used in the marks displayed must also be a Roman capital

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

§61.113 Private pilot privileges and limitations: Pilot in command.

(a) Except as provided in paragraphs (b) through (h) of this section, no person who holds a private pilot certificate may act as pilot in command of an aircraft that is carrying passengers or property for compensation or hire; nor may that person, for compensation or hire, act as pilot in command of an aircraft.

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

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

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

§91.7 Civil aircraft airworthiness.

4. No person may operate a civil aircraft unless it is in an airworthy condition.

§91.119 Minimum safe altitudes: General.

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

I *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.

§91.121 Altimeter settings.

(a) Each person operating an aircraft shall maintain the cruising altitude or flight level of that aircraft, as the case may be, by reference to an altimeter that is set, when operating—

(1) Below 18,000 feet MSL, to—

(i) The current reported altimeter setting of a station along the route and within 100 nautical miles of the aircraft;

(ii) If there is no station within the area prescribed in paragraph (a)(1)(i) of this section, the current reported altimeter setting of an appropriate available station; or

(iii) In the case of an aircraft not equipped with a radio, the elevation of the departure airport or an appropriate altimeter setting available before departure.

§91.151 Fuel requirements for flight in VFR conditions.

(a) No person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed—

(1) During the day, to fly after that for at least 30 minutes; or

(2) At night, to fly after that for at least 45 minutes.

(b) No person may begin a flight in a rotorcraft under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed, to fly after that for at least 20 minutes.

§91.203 Civil aircraft: Certifications required.

(a) Except as provided in §91.715, no person may operate a civil aircraft unless it has with it the following:

(1) An appropriate and current airworthiness certificate. Each U.S. airworthiness certificate used to comply with this subparagraph (except a special flight permit, a copy of the applicable operations specifications issued under §21.197I of this chapter, appropriate sections of the air carrier manual required by parts 121 and 135 of this chapter containing that portion of the operations specifications issued under §21.197I, or an authorization under §91.611) must have on it the registration number assigned to the aircraft under part

47 of this chapter. However, the airworthiness certificate need not have on it an assigned special identification number before 10 days after that number is first affixed to the aircraft. A revised airworthiness certificate having on it an assigned special identification number, that has been affixed to an aircraft, may only be obtained upon application to an FAA Flight Standards district office.

§91.405 Maintenance required.

Each owner or operator of an aircraft—

4. 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;

§91.407 Operation after maintenance, preventive maintenance, rebuilding, or alteration.

(a) No person may operate any aircraft that has undergone maintenance, preventive maintenance, rebuilding, or alteration unless—

(1) It has been approved for return to service by a person authorized under §43.7 of this chapter; and

§91.409 Inspections.

(a) Except as provided in paragraph (c) of this section, no person may operate an aircraft unless, within the preceding 12 calendar months, it has had—

(2) An inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter.

§91.417 Maintenance records.

(a) Except for work performed in accordance with §§91.411 and 91.413, each registered owner or operator shall keep the following records for the periods specified in paragraph (b) of this section:

Extent of Relief

The Extent Of Relief Ernest Conover d/b/a, Down To Earth Aerial Videography Seeks And The Reason Ernest Conover d/b/a, Down To Earth Aerial Videography Seeks The Relief From Section 45.23.

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

The Phantom2 Vision+ is a small UA measuring 12"X 12" and cannot carry passengers, does not have a cabin, cockpit or pilot station to display the required 2" Roman numerals described in Section 45.23. Because of this, Ernest Conover d/b/a/, Down to earth Aerial Videography is asking exemption from this rule. I would however be willing to display the 2" registration numbers on weather resistant material at the site of take-off to alert anyone that the UA is registered with the FAA.

1. The Extent Of Relief Ernest Conover d/b/a, Down To Earth Aerial Videography Seeks And The Reason Ernest Conover d/b/a, Down To Earth Aerial Videography Seeks The Relief From Section 61.113 (a) & (b).

(a) Except as provided in paragraphs (b) through (h) of this section, no person who holds a private pilot certificate may act as pilot in command of an aircraft that is carrying passengers or property for compensation or hire; nor may that person, for compensation or hire, act as pilot in command of an aircraft.

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

Relief from Section 61.113(a) & (b) entitled Private pilot privileges and limitations: Pilot in command, is requested to allow Ernest Conover acting PIC to conduct the proposed UAS flight operations for compensation or hire.

Relief is being requested because (1) The flight is incidental to that business or employment; and (2) the aircraft does not carry passengers or property for compensation or hire. Further, Ernest Conover d/b/a, Down To Earth Aerial Videography states that all flights of the Phanton 2 Vision+ UAS, conducted following the granting of this petition (1) will be incidental to Ernest Conover d/b/a, Down To Earth Aerial Videography; and(2) will not carry passengers or property for compensation or hire.

2. The Extent of Relief Ernest Conover d/b/a, Down To Earth Aerial Videography Seeks and the Reason Ernest Conover d/b/a, Down To Earth Aerial Videography Seeks the Relief from Section 91.7

§91.7 Civil aircraft airworthiness.

> (a) No person may operate a civil aircraft unless it is in an airworthy condition.
>
> (b) 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.

As stated in Section 91.7(b) 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.

Relief from Section 91.7(a) is requested to the extent that Ernest Conover, d/b/a Down to Earth Aerial Videography be allowed to determine that the Phantom 2 Vision+ is in airworthy condition prior to every pre-flight procedure listed below.

- Update the DJI Naza software to the UAS prior to flight

- Full inspection of the UAS

- Review the Phantom 2 Vision+ Pre-Flight Check List

Day before Mission- (1)Log onto Aviationweather.gov-Check weather conditions for mission day.
(2)Meet onsite to discuss flight procedure
(3)Check all batteries for proper charge
(a.) Phantom LiPo batteries
(b.)Controller
(c.)Wi-Fi Transmitter/Receiver
(d.) Iphone or Tablet
(4)Calibrate Controller connected to software

Day of Mission- (1) Log onto Aviationweather.gov-Check weather conditions
(2) Toggle switches on controller –Full Up
(3) Turn controller and Wi-Fi- On
(4) Remove gimbal lock and lens cap
(5) Micro SD card- Inserted
(6) Place UA in clear and safe launch and recovery position if it Returns to Home
(7) Phantom-Battery On
(8) Load FPV software on Iphone/Tablet
(9) Wi-Fi connection-Verified
(10) Calibrate Compass
(11) Satellite connections- 6 or more-Verified
(12)Start video recording (Video only)
(13) Take off and hover approximately 10 feet above the ground to confirm that UA is under control
(14) All sticks operate correctly while in hover –Verified

Pre-Landing Checklist (1)Cameral-Full up
2) Video recording-Stop
(3) Landing zone- Clear/Safe

Landing (1) Motors-Off
(2) Phantom battery-Off
(3 Controller-Off

4. Wi-Fi- Off

This relief is requested because the Phantom 2 Vision+ does not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H.

Ernest Conover d/b/a Down to Earth Aerial Videography will ensure that the Phantom 2 Vision+ is in airworthy condition in compliance with operating documents prior to every flight, and determining that the UA is in condition for safe flight.

3. The Extent of Relief Ernest Conover d/b/a, Down To Earth Aerial Videography Seeks and the Reason Ernest Conover d/b/a, Down To Earth Aerial Videography Seeks the Relief from Section 91.119 I

4. *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.

Relief from Section 91.119 I states that **e**xcept when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

Ernest Conover d/b/a, Down To Earth Aerial Videography will not fly the Phanton 2 Vision+ higher than 200 feet and it will not be operated in populated or congested areas. Flights will not take place on unauthorized properties. This exemption is necessary because photography, photogrammetry, and videography must be performed at low altitudes including those less than 200 feet.

Flights at lower altitudes will be equally safe as those flown at higher altitudes given the small size, weight, and speed of the Phantom 2 Vision+ in comparison. The Phantom will operate as a survey and photography tool and is never used for transportation. The Phantom2 Vision+ is tightly controlled during flights and does not carry any fuel. This eliminates most of the risks associated with conventional aircraft. Flights at lower altitudes also serve to distinguish the Phantom 2 Vision+ from conventional aircraft that operate under Section 91.119 I.

4. The Extent Of Relief Ernest Conover d/b/a, Down To Earth Aerial Videography Seeks And The Reason Ernest Conover d/b/a, Down To Earth Aerial Videography Seeks The Relief From Section 91.121 (a)

Section 91.121 (a) states:

(a) Each person operating an aircraft shall maintain the cruising altitude or flight level of that aircraft, as the case may be, by reference to an altimeter that is set, when operating—

(1) Below 18,000 feet MSL, to—

(i) The current reported altimeter setting of a station along the route and within 100 nautical miles of the aircraft;

(ii) If there is no station within the area prescribed in paragraph (a)(1)(i) of this section, the current reported altimeter setting of an appropriate available station; or

(iii) In the case of an aircraft not equipped with a radio, the elevation of the departure airport or an appropriate altimeter setting available before departure.

The Phantom 2 Vision+ does not have a radio to receive altimeter setting from a station along a flight route as described in Section 91.121 (a) (i) & (ii). As stated in section 91.121 (a) (iii) above, the Phantom 2 Vision+ is GPS enabled and has an altitude accuracy of 0-1 foot Above Ground Level "AGL". The onboard compass reads geomagnetic information and assists the GPS to accurately calculate the position and height of the small ultra light UA and has an Inertia Measuring Unit (" IMU") built-in tablet displaying on screen, via a Ground Station flight application.

5. The Extent Of Relief Ernest Conover d/b/a, Down To Earth Aerial Videography Seeks And The Reason Ernest Conover d/b/a, Down To Earth Aerial Videography Seeks The Relief From Section 91.151 (b)

(a) No person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed—

(1) During the day, to fly after that for at least 30 minutes; or

(2) At night, to fly after that for at least 45 minutes.

(b) No person may begin a flight in a rotorcraft under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed, to fly after that for at least 20 minutes

Relief from Section 91.151 (b) entitled Fuel requirements for flight in VFR conditions, is requested to the extent required to allow flights if the battery operated Phantom 2 Vision+ during daylight hours (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intent landing and, assuming normal cruising speed, to fly after that for at least 20 minutes. Ernest Conover d/b/a, Down To Earth Aerial Videography seeks relief through an exemption from Section 91.151 (b) because the flight duration of the battery powered Phantom 2 Vision+ is twenty-five minutes. Without this exemption, aerial acquisition and flight operations will become impractical. Importantly, as will be stated below, the technical specifications of the Phantom 2 Vision+, the Phantom 2 Vision+ documents and Ernest Conover d/b/a, Down to Earth Phantom 2 Vision+ will be operated safely during daylight hours and under Visual Flight Rules. Battery power is monitored by the DJI Ground Station Control "GSC" software installed on the Iphone or tablet and flight time limits can be adjusted before the Phantom 2 Vision+ Return To Home "RTH" feature is activated. Flight will be limited to 20 minutes from takeoff to first point of landing, leaving 5 minutes in reserve. A visual line of sight will be maintained with the Phantom 2 Vision+ at all times and will only fly landowner authorized ground.

6. The Extent Of Relief Ernest Conover d/b/a, Down To Earth Aerial Videography Seeks And The Reason Ernest Conover d/b/a, Down To Earth Aerial Videography Seeks The Relief From Section 91.405 (a), 91.407 (a)(1), 91.409 (a)(1) & (a)(2), and 91.417 (a) & (b).

Sections 91.405 (a), 91.407 (a)(1), 91.409 (a)(1) & (a)(2), and 91.417 (a) & (b) only apply to aircraft with an airworthiness certificate. Ernest Conover d/b/a, Down To Earth Aerial Videography requests relief from these sections because the Phantom 2 Vision+ does not require an airworthiness certificate. The Phantom 2 Vision+ meets the conditions off Section 333 of the FAA Modernization and Reform Act of 2012 (**FMRA**) for operating without an airworthiness certificate.

Ernest Conover d/b/a, Down To Earth Aerial Videography will perform all maintenance and preventive maintenance on the Phantom 2 Vision+ according to the methods, techniques and practices stated in the operating documents (The Phantom 2 Vision+ Manual, The Phantom 2 Vision+ Pre-Flight Checklist, The Phantom Pilot Training Guide and the Smart Flight Battery Safety Guidelines). Only a DJI Certified Service Center will be used to perform more advanced repairs on the Phantom 2 Vision+ system**.** Ernest Conover d/b/a, Down To Earth Aerial Videography will document and maintain all maintenance records for the Phantom 2 Vision+ in hard copy and digital format. The Phantom2 Vision+ is a small UA measuring 12” X 12”, weighing just under 3 pounds, 30 knot speed limitation and will be operating in a limited area.

Phantom2 Vision+ Preflight Mission Checklist

Day before Mission- (1)Log onto Aviationweather.gov-Check weather conditions for mission day.
(2)Meet onsite to discuss flight procedure
(3)Check all batteries for proper charge
(a.) Phantom LiPo batteries
(b.)Controller
(c.)Wi-Fi Transmitter/Receiver
(d.) Iphone or Tablet
(4)Calibrate Controller connected to software

Day of Mission- 1. Log onto Aviationweather.gov-Check weather conditions
2. Toggle switches on controller –Full Up
3. Turn controller and Wi-Fi- On
4. Remove gimbal lock and lens cap
5. Micro SD card- Inserted
6. Place UA in clear and safe launch and recovery position if it Returns to Home
7. Phantom-Battery On
8. Load FPV software on Iphone/Tablet
9. Wi-Fi connection-Verified
10. Calibrate Compass
11. Satellite connections- 6 or more-Verified
12.Start video recording (Video only)
13. Take off and hover approximately 10 feet above the ground To confirm that UA is under control
14. All sticks operate correctly while in hover –Verified

Pre-Landing Checklist
1.Cameral-Full up
2. Video recording-Stop
3. Landing zone- Clear/Safe

Landing
1. Motors-Off
2. Phantom battery-Off
3. Controller-Off
4. Wi-Fi- Off

A summary the FAA may publish in the Federal Registry.

Ernest Conover d/b/a, Down to Earth Aerial Videography, seeks exemption from the following provisions of the Federal Aviation Regulations (FAR's) in accordance with Section 333 of the FAA Modernization and Reform Act and 14 C.F.R. Part 11of 2012. 14 C.F.R. 45.23 (b),14 C.F.R. 61.113 (a) & (b),14 C.F.R. 91.7 (a),14 C.F.R. 91.119, 14 C.F.R. 91.121 (a),14 C.F.R. 91.151 (b),14 C.F.R. 91.405 (a),14 C.F.R. 91.407 (a)(1) 14 C.F.R. 91.409 (a)(1) & (a)(2),14 C.F.R. 91.417 (a) & (b).These exemptions will permit Ernest Conover d/b/a, Down to Earth Aerial Videography to operate an Unmanned Aircraft System (UAS) for commercial purpose of conducting aerial acquisitions within the National Airspace System. Due to the size, speed and weight, 14 C.F.R. Part 21; Subpart H the FAA is authorized to exempt aircraft from the airworthiness certificate under Section 333 of the Reform Act and is not applicable to this case. The Phantom2 Vision+ is a small UA measuring 12"X 12" and cannot carry passengers, does not have a cabin, cockpit or pilot station to display the required 2" Roman numerals described in Section 45.23. Because of this, Ernest Conover d/b/a/, Down to earth Aerial Videography is asking exemption from this rule. I would however be willing to display the 2" registration numbers on weather resistant material at the site of take-off to alert anyone that the UA is registered with the FAA. Relief from Section 61.113(a) & (b) entitled Private pilot privileges and limitations: Pilot in command, is requested to allow Ernest Conover acting PIC to conduct the proposed UAS flight operations for compensation or hire.

Relief is being requested because (1) The flight is incidental to that business or employment; and (2) the aircraft does not carry passengers or property for compensation or hire. Further, Ernest Conover d/b/a, Down To Earth Aerial Videography states that all flights of the Phanton 2 Vision+ UAS, conducted following the granting of this petition (1) will be incidental to Ernest Conover d/b/a, Down To Earth Aerial Videography; and(2) will not carry passengers or property for compensation or hire. Relief from Section 91.7(a) is requested to the extent that Ernest Conover, d/b/a Down to Earth Aerial Videography be allowed to determine that the Phantom 2 Vision+ is in airworthy condition prior to every flight.

- Update the DJI Naza software to the UAS prior to flight
- Full inspection of the UAS
- Review the Phantom 2 Vision+ Pre-Flight Check List

This relief is requested because the Phantom 2 Vision+ does not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H. Relief from Section 91.119 I states that **e**xcept when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

Ernest Conover d/b/a, Down To Earth Aerial Videography will not fly the Phanton 2 Vision+ higher than 200 feet and it will not be operated in populated or congested areas. Flights will not take place on unauthorized properties. This exemption is necessary because photography, photogrammetry, and videography must be performed at low altitudes including those less than 200 feet. Flights at lower altitudes will be equally safe as those flown at higher altitudes given the small size, weight, and speed of the Phantom 2 Vision+ in comparison. The Phantom will operate as a survey and

photography tool and is never used for transportation. The Phantom2 Vision+ is tightly controlled during flights and does not carry any fuel. This eliminates most of the risks associated with conventional aircraft. Flights at lower altitudes also serve to distinguish the Phantom 2 Vision+ from conventional aircraft that operate under Section 91.119 I.The Phantom 2 Vision+ does not have a radio to receive altimeter setting from a station along a flight route as described in Section 91.121 (a) (i) & (ii). As stated in section 91.121 (a) (iii) above, the Phantom 2 Vision+ is GPS enabled and has an altitude accuracy of 0-1 foot Above Ground Level "AGL". The onboard compass reads geomagnetic information and assists the GPS to accurately calculate the position and height of the small ultra light UA and has an Inertia Measuring Unit (" IMU") built-in tablet displaying on screen, via a Ground Station flight application. Relief from Section 91.151 (b) entitled Fuel requirements for flight in VFR conditions, is requested to the extent required to allow flights if the battery operated Phantom 2 Vision+ during daylight hours (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intent landing and, assuming normal cruising speed, to fly after that for at least 20 minutes. Ernest Conover d/b/a, Down To Earth Aerial Videography seeks relief through an exemption from Section 91.151 (b) because the flight duration of the battery powered Phantom 2 Vision+ is twenty-five minutes. Without this exemption, aerial acquisition and flight operations will become impractical. Importantly, as will be stated below, the technical specifications of the Phantom 2 Vision+, the Phantom 2 Vision+ documents and Ernest Conover d/b/a, Down to Earth Phantom 2 Vision+ will be operated safely during daylight hours and under Visual Flight Rules. Battery power is monitored by the DJI Ground Station Control "GSC" software

installed on the Iphone or tablet and flight time limits can be adjusted before the Phantom 2 Vision+ Return To Home "RTH" feature is activated. Flight will be limited to 20 minutes from takeoff to first point of landing, leaving 5 minutes in reserve. A visual line of sight will be maintained with the Phantom 2 Vision+ at all times and will only fly landowner authorized ground.

Sections 91.405 (a), 91.407 (a)(1), 91.409 (a)(1) & (a)(2), and 91.417 (a) & (b) only apply to aircraft with an airworthiness certificate. Ernest Conover d/b/a, Down To Earth Aerial Videography requests relief from these sections because the Phantom 2 Vision+ does not require an airworthiness certificate. The Phantom 2 Vision+ meets the conditions off Section 333 of the FAA Modernization and Reform Act of 2012 (**FMRA**) for operating without an airworthiness certificate.

Ernest Conover d/b/a, Down To Earth Aerial Videography will perform all maintenance and preventive maintenance on the Phantom 2 Vision+ according to the methods, techniques and practices stated in the operating documents (The Phantom 2 Vision+ Manual, The Phantom 2 Vision+ Pre-Flight Checklist, The Phantom Pilot Training Guide and the Smart Flight Battery Safety Guidelines). Only a DJI Certified Service Center will be used to perform more advanced repairs on the Phantom 2 Vision+ system**.** Ernest Conover d/b/a, Down To Earth Aerial Videography will document and maintain all maintenance records for the Phantom 2 Vision+ in hard copy and digital format. The Phantom2 Vision+ is a small UA measuring 12" X 12", weighing just under 3 pounds, 30 knot speed limitation and will be operating in a limited area.

Phantom 2 Vision+ Specifications

Phantom

Supported Battery
DJI 5200mAh LiPo Battery
Weight (Battery & Propellers included)
1242g

Hover Accuracy (Ready to Fly)
Vertical: 0.8m; Horizontal: 2.5m

Max Yaw Angular Velocity
200°/s

Max Tiltable Angle
35°

Max Ascent / Descent Speed
Ascent: 6m/s; Descent: 2m/s

Max Flight Speed
15m/s (Not Recommended)

Diagonal motor-motor distance
350mm

Gimbal

Working Current
Static : 750mA; Dynamic : 900mA

Control Accuracy
±0.03°

Controllable Range
Pitch : -90°－0°

Maximum Angular Speed

Pitch : 90°/s

Camera

Operating Environment Temperature
0℃-40℃

Sensor size

1/2.3"

Effective Pixels
14 Megapixels

Resolution
4384×3288

HD Recording
1080p30 & 720p

Recording FOV
110° / 85°

Operating Frequency
5.728 GHz－5.85 GHz

Communication Distance (open area)
CE Compliance: 400m; FCC Compliance: 800m

Receiver Sensitivity (1%PER)
-93dBm

Remote Control

Transmitter Power
CE Compliance: 25mW; FCC Compliance: 100mW

Working Voltage
120 mA@3.7V

Built-in LiPo Battery Working Current/Capacity
3.7V, 2000mAh

Operating Frequency
2412-2462MHz

Communication Distance (open area)
500-700m

Range Extender

Transmitter Power
20dBm

Power Consumption
2W

Appendix A Phantom 2 Vision+ User Manual

See PDF attachment "Phantom_2_Vision_Plus_User_Manual_V1.6_en.pdf"

Appendix B Phantom 2 Vision+ Pilot Training

See PDF attachment "Phantom_2_Vision_Plus_Pilot_Training_Guide_V1.1_en.pdf"

Appendix C Phantom 2 Vision+ Smart Flight Battery Safety Guidelines

See PDF attachment "Smart_Flight_Battery_Safety_Guidelines.pdf"