



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

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

June 25, 2015

Exemption No. 11899  
Regulatory Docket No. FAA-2015-1249

Mr. Justin H. Adams  
President  
UAVRG, LLC  
16335 Redbud Berry Lane  
Cypress, TX 77433

Dear Mr. Adams:

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 19, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of UAVRG, LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography, videography, and mapping.

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 +, DJI Phantom 3, 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<sup>1</sup>. 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, UAVRG, 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.

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<sup>1</sup> 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, UAVRG, 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+, DJI Phantom 3, 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.nts.gov](http://www.nts.gov).

If this exemption permits operations for the purpose of closed-set motion picture and television filming and production, the following additional conditions and limitations apply.

29. The operator must have a motion picture and television operations manual (MPTOM) as documented in this grant of exemption.
30. At least 3 days before aerial filming, the operator of the UAS affected by this exemption must submit a written Plan of Activities to the local Flight Standards District Office (FSDO) with jurisdiction over the area of proposed filming. The 3-day notification may be waived with the concurrence of the FSDO. The plan of activities must include at least the following:
  - a. Dates and times for all flights;
  - b. Name and phone number of the operator for the UAS aerial filming conducted under this grant of exemption;
  - c. Name and phone number of the person responsible for the on-scene operation of the UAS;
  - d. Make, model, and serial or N-Number of UAS to be used;
  - e. Name and certificate number of UAS PICs involved in the aerial filming;
  - f. A statement that the operator has obtained permission from property owners and/or local officials to conduct the filming production event; the list of those who gave permission must be made available to the inspector upon request;
  - g. Signature of exemption holder or representative; and
  - h. A description of the flight activity, including maps or diagrams of any area, city, town, county, and/or state over which filming will be conducted and the altitudes essential to accomplish the operation.
31. Flight operations may be conducted closer than 500 feet from participating persons consenting to be involved and necessary for the filming production, as specified in the exemption holder's MPTOM.

Unless otherwise specified in this grant of exemption, the UAS, the UAS PIC, and the UAS operations must comply with all applicable parts of 14 CFR including, but not limited to, parts 45, 47, 61, and 91.

This exemption terminates on June 30, 2017, unless sooner superseded or rescinded.

Sincerely,

/s/

John S. Duncan

Director, Flight Standards Service

Enclosures



4/19/2015

U. S. Department of Transportation  
Docket Management System  
1200 New Jersey Ave., SE  
Washington, DC 20590

Re: Exemption Request Section 333 of the FAA Reform Act

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the Reform Act) and 14 C.F.R. Part 11, UAVRG, LLC, an woman owned small business focused on UAS applications utilizing developing software, inspection, assessments and consulting services, UAVRG, LLC hereby applies for an exemption from the listed Federal Aviation Regulations ("FARs") to allow commercial operation of its Small Unmanned Aircraft Systems ("sUAS") UAVRG, LLC UAS Platforms DJI Series, Phantom II+, Phantom 3, and Inspire 1.

UAVRG, LLC will provide on-demand commercial UAS operations for public and private sectors clients including the following applications below:

- Aerial Videography & Photography/Mapping/Assessment
- Agriculture Survey and Assessments
- Real Estate Videography & Photography/Mapping/Assessment
- Oil Spill Response & Planning Mapping/ Inspection/Assessments
- Offshore Platform Inspection/Assessments
- Pipeline Mapping/ Inspection/Assessments
- Refinery Mapping/ Inspection/Assessments
- SPCC Spill Prevention Control and Countermeasures Mapping/ Inspection/Assessments
- Damage Assessment
- Public Safety Mapping/ Inspection/Assessments/Search and Rescue
- Wind Farm Inspections

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.

As detailed in this document, the requested exemption would permit the operation of sUAS 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 best practices safety protocols followed by UAVRG, LLC. Approval of this exemption would thereby enhance safety and fulfill the Secretary of Transportation's (the FAA Administrator's) responsibilities to "...establish requirements for the safe operation of such aircraft systems in the national airspace system." Section 333(c) of the Reform Act.

**The name and address of the applicant is:**

**UAVRG, LLC**

16335 Redbud Berry Lane

Cypress, TX 77433

Phone +1-832-497-1985

Justin H Adams, President/COO

Email: jadams@uavrg.com

**Regulations from which the exemption is requested:**

**14 C.F.R. Part 21**

**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. 91.9 (b) (2)**

**14 C.F.R. 91.103**

**14 C.F.R. 91.109**

**14 C.F.R. 91.119**

**14 C.F.R. 91.121**

**14 C.F.R. 91.203 (a) & (b)**

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

**14 C.F.R. 407 (a) (1)**

**14 C.F.R. 409 (a) (2)**

**14 C.F.R. 417 (a) & (b)**

**I. STATUTORY AUTHORITY FOR EXEMPTIONS**

The Federal Aviation Act expressly grants the FAA authority to issue exemptions. This statutory authority includes exempting civil aircraft, as the term is defined under §40101 of the Act, including sUASs, from the requirement that all civil aircraft must have a current airworthiness certificate.

The Administrator may grant an exemption from a requirement of a regulation prescribed under subsection (a) or (b) of this section or any sections 44702-44716 of this title if the Administrator finds the exemption in the public interest. 49 U.S.C. §44701(f) See also 49 USC §44711(a); 49 USC §44704; 14 CFR §91.203(a) (1).

Section 333(b) of the Reform Act assists the Secretary in determining whether sUAS may operate in the National Airspace System (NAS) without creating a hazard to the user, the public, or a threat to national security. In making this determination, the Secretary must consider:

- The sUAS's size, weight, speed, and operational capability;
- Whether the sUAS operates within the visual line of sight of the operator
- Whether the sUAS operates outside of highly populated areas and away from close proximity to airports

Reform Act §333(a). If the Secretary determines that a sUAS “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.” Id. §333(c).

UAVRG, LLC sUAS are multirotor vehicles, weighing 10 or fewer lbs. including payload. They operate under normal conditions at a speed of no more than 30 knots and have the capability to hover, and move in the vertical and horizontal plane simultaneously. The sUAS will operate only in the Pilot’s visual line of sight at all times and will operate only within the sterile area described in Mission Planning Worksheet, attached as Exhibit One & Four(hereinafter MissionPlanningWorksheet) Such operations will insure that the sUAS will “not create a hazard to users of the national airspace system or the public.” Reform Act Section 333 (b).

Given the small size of the sUAS involved and the restricted and sterile environment within which they will operate, our application falls squarely within the zone of safety (an equivalent level of safety) in which Congress envisioned that the FAA must, by exemption, allow commercial operations of sUAS to commence immediately. Also due to the small size of the sUAS and the low altitudes and restricted areas in which the sUAS will operate, approval of the application presents no national security issue.

Given the clear direction in Section 333 of the Reform Act, the authority contained in the Federal Aviation Act, as amended; the strong equivalent level of safety surrounding the proposed operations, and the significant public benefit, including enhanced safety, the grant of the requested exemptions is in the public interest. Accordingly, UAVRG, LLC respectfully requests that the FAA grant the requested exemption without delay.

## **II. PUBLIC INTEREST**

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 of Transportation 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. By granting an exemption the FAA will fulfill Congress’s intent of allowing UAS to operate with significant safety precautions in low risk environments.

The use of sUAS on a Public and Private applications can significantly reduce the risk while inspecting, surveying, or monitoring missions. sUAS can inspect, photograph, and collect data on hard to get to areas that otherwise would require worker inspection.

Additionally, sUAS could replace the use of helicopters and small aircraft to monitor sites. The sUAS we propose to fly in this application are under five pounds, and carry no combustible material on board, as opposed to the much larger conventionally powered small aircraft. Shifting to sUAS from helicopters presents a marked safety increase for our workers and the public.

Lastly, sUAS reduce the environmental impact by dramatically decreasing the energy used for aerial imaging and data collection over a construction site. Our sUAS use rechargeable lithium ion batteries, as opposed to fossil fuels burned in operation of small aircraft that are many hundreds of times heavier.

### III. EQUIVALENT LEVEL OF SAFETY

UAVRG, LLC proposes that the exemption requested herein apply to sUAS that have the characteristics and that operate with the limitations listed herein. These limitations provide for at least an equivalent or even higher level of safety to operations under the current regulatory structure because the proposed operations represent a safety enhancement to the already safe protocols followed on construction sites and imaging and surveying operations conducted with helicopters and other conventional aircraft.

UAVRG, LLC will be bound by the following limitations when conducting its sUAS operations under an FAA issued exemption:

1. The sUAS will be less than 10 pounds.
2. Mission Planning to be conducted prior to each Mission Tasking See Exhibit One & Four
3. Flights will be operated within visual line of sight of a pilot with a VO Visual Observer as required.
4. Maximum total flight time for each operational flight will be 20 minutes. The UAS calculates battery reserve in real time, and will return to its ground station with at least 20% battery power reserve should that occur prior to the 15 minute limit.
5. Flights being operated never exceeding 400 feet AGL.
6. Crew for each operation will consist of the sUAS Pilot and VO who will keep the sUAS within his visual line of sight at all times
7. The sUAS Pilot will be minimum holder of Private Pilot Certificate with a Class 3 Medical or Issued State Driver License.
8. The sUAS will only operate within a planned flight profile, unless conditions warrant a different path due to changing conditions and environment.
9. All flights will be conducted within set guidelines of weather constraints.
10. All flight will be conducted 5NM outside of designed FAA Airport in AFD.
11. A briefing will be conducted in regard to the planned sUAS operations prior to each day's production activities. It will be mandatory that all personnel who will be performing duties within the boundaries of the safety perimeter be present for this briefing.
12. All flights will have prior consent from property owner or designee.
13. Pilots will have been trained in operation of UASs generally and received up-to-date information on the particular UAS.
14. All required permissions and permits will be obtained from territorial, state, county or city jurisdictions, including local law enforcement, fire, or other appropriate governmental agencies.
15. If the sUAS loses communications or loses its GPS signal, it will have capability to enter "loiter mode" and hover, reestablish satellite connection, and return to a pre- determined location within the Security Perimeter and land.

### IV. DESCRIPTION OF SPECIFIC REGULATIONS

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

Sections 61.113 (a) & (b) limit private pilots to non-commercial operations. Because the sUAS will not carry a pilot or passengers, the proposed operations can achieve the equivalent level of safety of current operations by requiring the Pilot operating the aircraft to have completed a sUAS a minimum of 100 Cycles of Landing and Takeoff with min of 50 Flight Hours in Type of craft. Unlike a conventional aircraft that carries the pilot and

passengers, the sUAS is remotely controlled with no living thing or cargo on board. DJI UAS Platforms are also operated by an autopilot, which greatly reduces the danger of human error. The area of operation is controlled and restricted, and all flights are planned and coordinated in advance as set forth in Mission Plan Worksheet.

The sUAS to be operated hereunder is less than 10 lbs. fully loaded, carries neither a pilot nor passenger, carries no explosive materials or flammable liquid fuels, and operates exclusively within a secured area as set out in the Manual. Like other civil aircraft, operations under this exemption will be tightly controlled and monitored by the operator, pursuant to the Manual's requirements, and under the requirements and in compliance with local public safety requirements, to provide security for the area of operation as is currently done on active construction sites. The FAA will have advance notice of all operations.

The risks associated with the operation of the sUAS are therefore diminished from the level of risk associated with commercial operations contemplated by Part 61 when drafted, and allowing operations of the sUAS as requested with a Pilot who has met the minimum requirements stated in the Manual achieves the level of safety contemplated by 14 C.F.R. §61.113 (a) & (b).

#### **14 C.F.R. 91.103: Preflight Action**

This regulation requires each pilot in command take certain actions before flight to ensure the safety of flight. An exemption is needed from this requirement as the Pilot will take separate preflight actions, including checking for weather conditions, checking flight battery requirements, checking takeoff and landing distances, and all other actions in the Preflight Checklist in the Manual. These actions will provide an equivalent level of Safety. See Exhibit One and Four.

#### **14 C.F. R. 91.119: Minimum Safe Altitudes**

Section 91.119 establishes safe altitudes for operation of civil aircraft. Section 91.119 (d) allows helicopters to be operated at less than the minimums prescribed, provided the person operating the helicopter complies with any route or altitudes prescribed for helicopters by the FAA. This exemption is for a multirotor craft that flies similarly to a helicopter, with vertical takeoff and vertical landing, which will typically operate at altitudes of 200 AGL, so an exemption may be needed to allow such operations. The sUAS will never operate at altitude higher than 400 AGL and will be mission flight profile, where buildings and people will not be exposed to operations without their pre-obtained consent.

The equivalent level of safety will be achieved given the size, weight, speed of the sUAS as well as the location where it is operated. No flight will be taken without the permission of the property owner or local officials. Because of the advance notice to the property owner and any onsite personnel as outlined in the Manual, all affected individuals will be aware of the planned flight operations. Unlike flight operations with aircraft or rotorcraft weighing far more than the maximum 10 lbs. proposed herein, our sUAS will not carry flammable fuel. In addition, the low-altitude operations of the sUAS will ensure separation between sUAS operations and the operations of conventional aircraft that must comply with Section 91.119.

#### **14 C.F.R. 91.121: Altimeter Settings**

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, pursuant to the Manual and Safety Check list, confirming the altitude of the launch site shown on the GPS altitude indicator before flight.

#### **14 CFR 91.151 (a): Fuel requirements for flight in VFR conditions**

Section 91.151 (a) outlines fuel requirements for beginning a flight in VFR conditions. Our sUAS is limited to operations in sterile and controlled environments as outlined in the Manual, and has a limited range and flight time which require an exemption from 14 CFR 91.151(a).

The battery powering the sUAS provides approximately 20 minutes of powered flight. To meet the 30 minute reserve requirement in 14 CFR §91.151, sUAS flights would be limited to approximately 10 minutes in length. Given the limitations on the sUAS's proposed flight area and the location of its proposed operations within a predetermined area, a longer time frame for flight in daylight or night VFR conditions is reasonable.

UAVRG, LLC believes that an exemption from 14 CFR §91.151(a) falls within the scope of prior exemptions. See Exemption 10673 (allowing Lockheed Martin Corporation to operate without compliance with FAR 91.151 (a)). Operating the small sUAS, in a tightly controlled area where only people and property owners or official representatives who have signed waivers will be allowed, with less than 30 minutes of reserve fuel, does not engender the type of risks that Section 91.151(a) was intended to alleviate given the size and speed of the small UAS. Additionally, limiting sUAS flights to 10 minutes would greatly reduce the utility for which the exemption will be granted.

An equivalent level of safety can be achieved by limiting flights to 30 minutes, or enough battery reserve to ensure that the sUAS lands at the ground station with at least 20% of battery power (as determined by the onboard monitoring system and the Pilot), whichever happens first. This restriction would be more than adequate to return the sUAS to its planned landing zone from anywhere in its limited operating area.

Similar exemptions have been granted to other operations, including Exemptions 2689F, 5745, 10673, and 10808.

#### **14 CFR 91.405 (a); 407 (a)(1); 409 (a)(2); 417 (a) & (b): Maintenance inspections**

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 to UAVRG, LLC. Maintenance will be accomplished by the operator pursuant to the flight manual and operating handbook as referenced Exhibit Two. An equivalent level of safety will be achieved because these small sUAS are very limited in size and 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 provided in the Manual and Checklist, the Pilot will ensure that the sUAS is in working order prior to initiating flight, perform required maintenance, and keep a log of any maintenance performed. Moreover, the Pilot 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.

Pursuant to 14 C.F.R. Part 11, the following summary is provided for publication in the Federal Register, should it be determined that publication is needed:

Applicant seeks an exemption from the following rules: 14 C.F.R. §21, subpart H; 14 C.F.R 45.23(b);14 C.F.R. §§ 61.113( a) & (b);91.7

(a); 91.9 (b) (2);91.103(b);91.109; 91.119; 91.121; 91.151(a);91.203(a) and (b); 91.405 (a); 91.407 (a) (1); 91.409 (a) (2); 91.409 (a) (2) and 91.417 (a) & (b) to operate commercially a small unmanned vehicle (55lbs or less) in construction operations.

Approval of exemptions allowing commercial operations of sUAS in the public/private sector enhances safety while reducing risk. Manned aircraft monitoring and surveying creates a greater risk because the craft are much larger, have combustible fuel, and carry an onboard human pilot. In contrast, a sUAS weighing fewer than 10 lbs. and powered by batteries eliminates virtually all of that risk given the reduced mass and lack of combustible fuel carried on board. The sUAS will carry no passengers or crew and, therefore, will not expose them to the risks associated with manned aircraft flights.

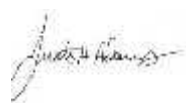
The operation of small sUAS, weighing less than 10 lbs., conducted in the strict conditions outlined above, will provide an equivalent level of safety supporting the grant of the exemptions requested herein, including exempting the applicant from the requirements of Part 21 and allowing commercial operations. These lightweight aircraft operate at slow speeds, close to the ground, and in a sterile environment and, as a result, are far safer than conventional operations conducted with turbine helicopters operating in close proximity to the ground and people.

## **Privacy**

All flights will occur over private or controlled access property with the property owner's prior consent and knowledge. Images taken will be of individuals who have also consented to being filmed or otherwise have agreed to be in the area where aerial photography will take place.

Satisfaction of the criteria provided in Section 333 of the Reform Act of 2012--size, weight, speed, operating capabilities, proximity to airports and populated areas and operation within visual line of sight and national security – provide more than adequate justification for the grant of the requested exemptions allowing commercial operation of applicant's sUAS in public/private sector as defined above

Sincerely,



Justin H. Adams  
President/COO

## Attachments

Note: Due to file size limitation on Regulations.gov hyperlinks have been provided below

Exhibit One-Mission Planning Worksheet

Exhibit Two – Maintenance Worksheet

Exhibit Three – UAS Flight Log

Exhibit Four – Pre Mission Planning

[DJI Phantom Vision 2+V3 Spec](#)

[Phantom 2 Vision+ Pilot Training Guide v1.1](#)

[Phantom 2 Vision+ Quick Start Guide](#)

[Phantom 2 Vision + User Manual v1.8](#)

[DJI Phantom 3 Specs](#)

[DJI Inspire 1 Spec](#)

[DJI Inspire 1 Maintenance Manual V1.0](#)

[DJI Inspire 1 Quick Start Guide](#)

[DJI Inspire 1 Safety Guidelines](#)

[DJI Inspire 1 User Manual](#)



UAVRG, LLC Mission Checklist

Customer Name	
Customer Email	
Customer Phone Number	
Flight Location Address	
Flight Plan Lat/Long Boundaries	
Nearest Airport	

<b>Mission Planning</b>	<b>Yes</b>	<b>No</b>	<b>NA</b>	<b>Comments</b>
Review Proposed Flight Area				
Review Airspace Constraints				
Review if flight path is within 5NM of Airport Designated under AFD				
Review if flight path is on or inside Instrument Approach Path				
Review Sunrise Sunset Times for designated flight area				
Review NOTAMS				
Review Possible Obstructions				
Review UAVforecast.com Seven Day Forecast				
Review Terminal Area Forecast to Nearest Location				
Review KP Index Forecast				
Assignment of designated(VO) Visual Observer				
Review Proposed Flight Plan				
Review Flight Limitations				
Review of Flight Maintenance Logs				
<b>Preflight</b>				
Verification of All Firmware is update and test flown.				
Review Current Flight Plan				
Review Current Notams				
Review Obstructions				
Review Current WX Nearest Station				
Does Wind Exceed 20kts If Exceeds No Flight				
Does Ceiling Exceed 500' above flight plan height If Exceeds no Flight				
Does Visibility Exceed 3NM				
Flight will be at least 500' from nonparticipating person vessels vehicles and structures				
UAS Preflight Inspection				
Check UAS for visual signs of damage, if damage do not fly				
Ensure propellers are tightly fastened and not damaged				
Check propellers are in correct positions on motors				
Ensure that motors spinn free and are not damaged				
Flight Controller Batter Exceed 90% Charge				
Flight Controller Range Extender Exceed 90%				
UAS System Battery Exceed 90%				
Flight Vision System Battery exceeds 90%				
Preflight Calibrations of Flight Controller				
Insert Battery into UAS				
Turn on Controller/Range Extender				
Connect Vision Device to UAS Wifi				
Establish Go Home Location				
Verify Min of Eight Satellites are seen by UAS				
<b>Flight</b>				
Announce Voice Clear Prop				
Start Engines of UAS				
Validate UAS Startup				
Increase Throttle to lift off				
Increase Power to apx 6" Hover and establish X,Y,Z Movement in Controls				
Proceed Preplanned Flight				
Flight Plan Execution				
Monitor Flight Telemetry				
Return Flight to designated landing location				
Stop Engines				
<b>Post Flight Inspection</b>				
Inspect UAS for any abnormalities				
Downlink Data				
Remove Battery				
Turn off Flight Controller/Range Extender				

# UAVRG, LLC Maintenance CheckList

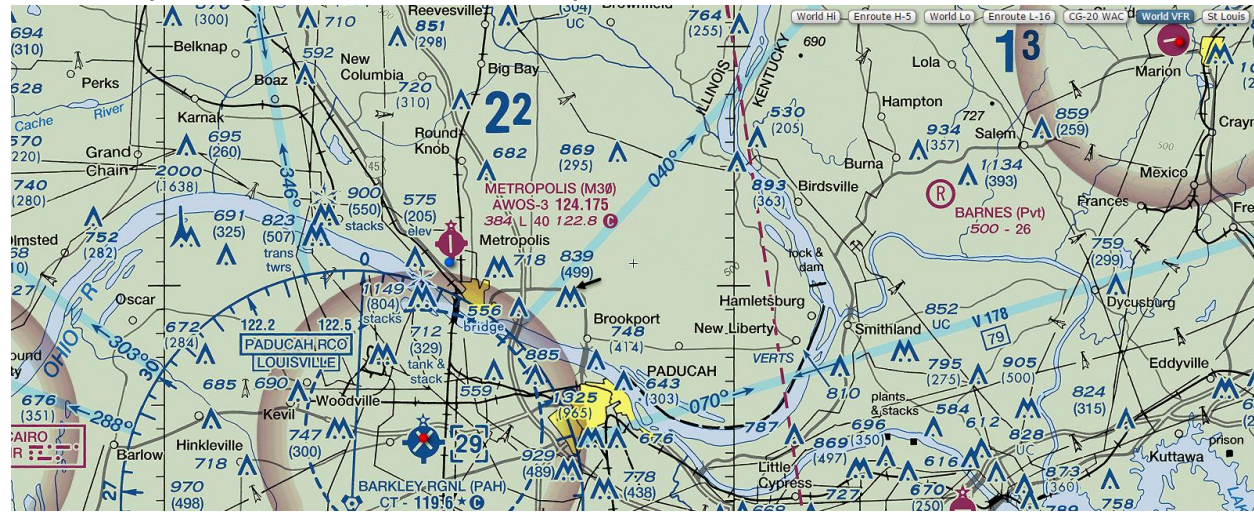
Customer Name	
Customer Location	
Mission Flight #	
Date/Time	
	Checked
<b>Airframe</b>	
Check that all the screws on the frame, gimbal and motor mounts are still securely fastened.	
Check that all the ABS parts are still intact and do not show signs of wear or fatigue, particularly the inner mounts	
Check the carbon plates and tubes for wear and damage that would reduce the structural integrity of the frame.	
<b>Motors</b>	
Check that the prop holder is still secure fastened to the motor with all three screws and that the nut and tread that secures the prop is still in good condition.	
Check that the motor is still securely fastened to the motor mount with all 4 screws.	
Check that the motor runs smooth when turned by hand and that there is not any play in the bearings.	
Check that the motors are free of dust and any other foreign particles.	
Check that the motor windings do not show any damage or bubbling/melting. Also check that the motor wires are not damaged.	
Check that the motor windings do not show any damage or bubbling/melting. Also check that the motor wires are not damaged.	
<b>Electronics</b>	
Check that the battery connector is in good condition and that the soldering is still secure. Also make sure the wires are not damaged.	
Check that the wires between the ESC and the motors are not damaged.	
Check that all the different electronic modules are still securely fastened. Check the ESC, Gimbal Control Board, Receiver, Flight Controller, GPS/Compass, etc.	
Check that all the various plugs that connect all the electronics are still securely plugged in.	
Check that all the electronics are free of dust or dirt.	
Check sensor readings for abnormalities. (Check in Mission Planner, Compass reading, GPS, attitude, etc. See	
<b>Radio</b>	
Check that the control gimbals are free from dust and other particles.	
Check that the battery is still in good condition.	
Perform a radio range check. (See radio manual for details)	
<b>Lipo Batteries</b>	
Check that the battery is not punctured or does not have any other physical damage. The battery should also not be swollen at all.	
Check that all the cells of the battery are balanced. (Within 0.1V of each other)	
Check that the battery connector is in good condition and that the soldering is still secure. Also make sure the wires are not damaged.	

Signature 1

Signature 2

[illegible]

## Review Propose Flight Area/NOTAM/TFR/Airspace Constrants



Locations: Sort By: Default Report Keyword Sort: GO

### KPAH

Data Current as of: **Sun, 19 Apr 2015 16:20:00 UTC**

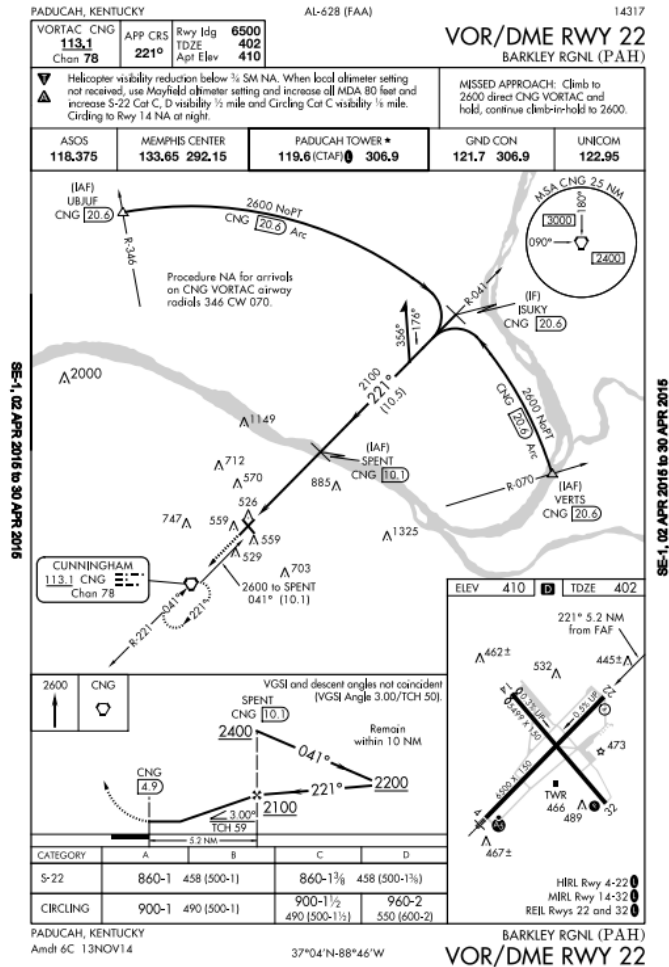
KPAH BARKLEY RGNL

[\[Back to Top\]](#)

☒ Check All KPAH ☐ UnCheck All KPAH

- ☐ IPAH 04/015 PAH OBST TOWER LGT (ASR 1048114) 370256.00N0883652.00W (7.6NM E PAH) 1325.5FT (964.6FT AGL) OUT OF SERVICE 15041817
- ☐ IPAH 04/005 PAH OBST TOWER LGT (ASR 1209288) 365812.70N0884105.70W (6.8NM SE PAH) 830.1FT (335.0FT AGL) OUT OF SERVICE 15040618
- ☐ IPAH 03/048 PAH OBST TOWER LGT (ASR 1222068) 365932.10N0885919.20W (11.2NM WSW PAH) 969.8FT (500.0FT AGL) OUT OF SERVICE 15032019
- ☐ IPAH 03/001 PAH OBST TOWER LGT (ASR 1250480) 370238.60N0883843.40W (6.2NM E PAH) 794.9FT (330.1FT AGL) OUT OF SERVICE 150302190

# Instrument Approach VOR/DME Rwy 22 – Alt 2200AGL



### Sunrise/Sunset/UAVForecast

Monday 2015-04-20: sunrise 06:13, sunset 19:34										
Time	Wind	Temp	Wind Chill	Precip %	Cloud Cover	Visibility	Visible Sats	Kp	Est. Sats Locked	Good to Fly?
07:00 ☀	13 mph →	56°F	56°F	5%	85%	7 miles	8	2	8.0	yes
08:00 ☀	13 mph →	56°F	56°F	4%	89%	9 miles	11	2	9.9	yes
09:00 ☀	14 mph →	55°F	55°F	6%	94%	9 miles	11	2	10.4	yes
10:00 ☀	15 mph →	56°F	56°F	6%	96%	9 miles	11	3	10.4	yes
11:00 ☀	16 mph →	58°F	58°F	5%	85%	10 miles	10	3	9.4	yes
12:00 ☀	16 mph →	60°F	60°F	3%	66%	10 miles	10	3	9.2	yes
13:00 ☀	16 mph →	62°F	62°F	2%	48%	10 miles	10	3	9.1	yes
14:00 ☀	16 mph →	63°F	63°F	1%	36%	10 miles	11	3	10.0	yes
15:00 ☀	17 mph →	63°F	63°F	0%	28%	10 miles	9	3	8.7	yes
16:00 ☀	16 mph →	63°F	63°F	0%	20%	10 miles	11	4	10.0	yes
17:00 ☀	13 mph →	62°F	62°F	0%	16%	10 miles	11	4	10.4	yes
18:00 ☀	11 mph →	61°F	61°F	0%	15%	10 miles	11	4	10.4	yes
19:00 ☀	9 mph →	59°F	59°F	0%	19%	10 miles	9	4	8.9	yes

### Terminal Area Forecast Nearest Station

The most recent METAR observation for PAH was updated at: 16:07 UTC

#### METAR

##### [KPAH](#)

191607Z 22003KT 1 3/4SM -RA BR BKN007 OVC016 19/17 A2958 RMK AO2 RAE1556B07 P0000  
T01890172 \$

##### [KM30](#)

191555Z AUTO 18004KT 7SM SCT007 SCT011 OVC017 19/19 A2958 RMK AO2 T01900190  
(7.6 nm NE from PAH)

##### [KM25](#)

191555Z AUTO 18005KT 10SM BKN009 OVC015 19/18 A2960 RMK AO2  
(19.7 nm SE from PAH)

#### TAF

##### [KPAH](#)

191120Z 1912/2012 12004KT 3SM -SHRA BR SCT006 OVC015 TEMPO 1912/1915 2SM TSRA BR OVC006CB  
FM191800 22006KT P6SM OVC020 FM200000 20006KT P6SM VCTS BKN030CB FM200600 21006KT 4SM -  
SHRA BR BKN020 PROB30 2006/2012 2SM TSRA BR OVC010CB

## Review Flight Plan

