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

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

September 11, 2015

Exemption No. 12828
Regulatory Docket No. FAA−2015−1847

Mr. Robert B. Schneider
Research Laboratories, Inc.
2010 Jimmy Durante Boulevard
Del Mar, CA 92192

Dear Mr. Schneider:

This letter is to inform you that we have granted your request for exemption. It transmits our decision, explains its basis, and gives you the conditions and limitations of the exemption, including the date it ends.

By letter dated May 6, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Research Laboratories, Inc. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial imaging and information services for the residential, commercial, and industrial sectors, and closed-set motion picture, television, and film production operations.

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

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

Airworthiness Certification

The UAS proposed by the petitioner is a DJI Phantom 2.

The petitioner requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*. In accordance with the statutory criteria provided in Section 333 of Public Law 112−95 in reference to 49 U.S.C. § 44704, and in

consideration of the size, weight, speed, and limited operating area associated with the aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that the requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates,* and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

You have requested to use a UAS for aerial data collection[1] and closed set motion picture and filming. 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, Research Laboratories, Inc. 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 and closed set motion picture and filming. This exemption is subject to the conditions and limitations listed below.

[1] Aerial data collection includes any remote sensing and measuring by an instrument(s) aboard the UA. Examples include imagery (photography, video, infrared, etc.), electronic measurement (precision surveying, RF analysis, etc.), chemical measurement (particulate measurement, etc.), or any other gathering of data by instruments aboard the UA.

Conditions and Limitations

In this grant of exemption, Research Laboratories, Inc. is hereafter referred to as the operator.

Failure to comply with any of the conditions and limitations of this grant of exemption will be grounds for the immediate suspension or rescission of this exemption.

1. Operations authorized by this grant of exemption are limited to the DJI Phantom 2 when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

2. Operations for the purpose of closed-set motion picture and television filming are 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 September 30, 2017, unless sooner superseded or rescinded.

Sincerely,

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

Enclosures

Date: 05/08/2015

Number: 202-493-2251

Send To: Docket Operations

Attention: Sir or Madam

Office Location:

Docket Operations Room W12-140
of the West Building Ground Floor
at 1200 New Jersey Avenue, SE.,
Washington, DC

From:

Robert Schneider

CEO Research Laboratories, Inc.

Phone Number: 714-852-2103

Total Pages Including Cover: 8

Fax

[X]	Reply ASAP	[X]	Please Comment	[X]	Please Review	[ ]	For Your Information	[ ]	

May 6, 2015

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

Re: Exemption request under Section 333 of the FAA Modernization and Reform Act of 2012 (the Reform Act) and 14 C.F.R. Part 11

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, Research Laboratories, Inc., a software and technology consulting firm, on behalf of itself and its related affiliates under common ownership and control, hereby applies for an exemption from the listed Federal Aviation Regulations (FAR) to allow safe operation of unmanned aircraft (UA) in concert with unmanned aircraft systems (UAS) and related ground control stations for civil commercial use within the National Airspace System. The purpose being aerial imaging and information services for the residential, commercial, and industrial sectors, and closed-set motion picture, television, and film production operations.

All flight operations are to be conducted within and under the conditions outlined herein and as outlined by Title 14, Section 333.

As detailed in this document and the attached supporting documentation, the requested exemption would allow safe UA operation under human-supervised, controlled mission planning conditions with public safety considerations in airspace that is 1) limited 2) pre-determined, and 3) controlled with regard to the safety of adults, children, and animals.

Name and address of applicant:

Research Laboratories, Inc.
Robert B. Schneider
2010 Jimmy Durante Blvd., Suite 220F
Del Mar, CA 92192
Tel: 714-852-2103
Email: rschneider@research-laboratories, Inc.

Sincerely,

Robert B. Schneider
Research Laboratories, Inc.
Chief Executive Officer

Statutory authority for proposed exemptions

We are seeking exemption from regulations outlined in Section 333 of the FAA Modernization and Reform Act of 2012 and 14 C.F.R. Part 11. This request is submitted as our business is engaged in new technologies, and advancing the existing state of the art in software systems related to aircraft, particularly in the arena of unmanned aircraft systems with an emphasis on avionics, ground control stations, and telemetry.

We are also seeking exemption the following: Part 21, Subpart H; and §§ 45.23(b); 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) & (b); 91.405(a); 91.407(a)(1); 91.409(a)(2); and 91.417(a) & (b) of Title 14, Code of Federal Regulations (CFR).

Extent and reason for relief

The UA described herein is the popular DJI Phantom 2, with telemetry and avionics operated and controlled by a computer ground station, as part of the UAS, and utilizing backup system redundancy using the factory RF handheld remote controller. The specifications, as they pertain to this petition, are listed below in the *Flight planning assumptions and limitations* section. We are seeking relief from a select number of CFR'S particularly pertaining to airworthiness and certification.

Presently, we have identified a need for aerial imaging services for commercial/residential real industries, real estate, and tourism, as well as providing aerial inspection services for commercial entities. As such, we are interested in providing aerial information services to include images, video, electronic mapping/geographical survey work, and closed-set motion picture, television, and film production capacities for a broad range of clientele.

An exemption, if granted, would increase and enhance public awareness of UA's by having a commercial entity providing leadership in this area. We also plan on offering a weekend ground school, taught by Certified Flight Instructors to allow hobby users a better opportunity chance to understand the aerodynamics of flight, weather, and the potential hazards involved in flying these craft on their own. By educating the public on UA's and UAS (systems) through proper stewardship, we believe they will come to understand that it is not as simple as pushing a button, or programming a GPS to achieve the desired results necessary for successfully flying a UA mission/flight plan.

Public interest and public safety

We understand the need for public education in this arena. Part of our business model includes involvement of those living near, or even working near our anticipated flight zones to come out and witness the actual flight live from the ground station, by an experienced pilot to help increase public awareness. The bystanders, many of whom are very interested and curious about this technology, may witness first hand what may be awe-inspiring to them.

We expect this approach to be both a learning tool and a sales tool. If this industry is to succeed on its own terms, then responsible mission planning, cautious flight operation, and leadership through example are crucial elements to the success of commercial UA operation. As will be demonstrated, we intend to push the creative boundaries of what is possible with these smaller craft, and hopefully advance the state of the art at a mid-tier level in the commercial domain, while maintaining safe flight paths, and providing multiple layers of envelope protection for our UA fleet.

Additionally, all flight operations will be performed with consent of the property owners, including those abutting or adjacent to planned flight activities where overflying may be required or might otherwise occur accidentally.

Public safety equal to the existing rule of law

In addition to compliance with FAA mandate, our intent is to operate the UA in accordance with published Federal Aviation Regulations (FAR/AIM), while adhering to an equivalent level of safety to general aviation flight maneuvers. Flight operations include system redundancy, backup telemetry, and an audio-visual warning system. For auto-pilot operations, GPS programmed waypoints will be entered, the craft monitored continuously, and operated according to already prescribed regulations and proposed guidelines, such as avoiding flights over high population density areas, over persons, in prohibited airspace, while maintaining line-of-sight (LOS) with UA and providing self-certification of airworthiness. We do not anticipate flights within restricted airspace or major metropolitan cities, or wherever UA operations are otherwise prohibited without the proper authority and clearance to do so.

Our ground control station has safety and backup features that extend beyond those provided by the manufacturer. For example, should the GPS or avionics fail, the system will revert from protected mode (normal law via GPS) to direct law, thereby allowing the pilot in command (PIC) to take control of the aircraft on a different frequency than that of the ground control station/UAS. Navigation, speed, and elevation are each managed individually according to the flight plan and relayed to the UAS/PIC in real-time.

Regarding privacy, flights over private land or in a controlled access environment will occur with knowledge or consent by the property owner(s). Any individuals who are readily identifiable, and who have been photographed outside the permissible area will not be shown in the imaging, unless a release form is signed, or verbal consent is otherwise given.

Flight planning assumptions and limitations

In addition to the aforementioned FARs and regulations regarding small unmanned aircraft use, Research Laboratories, Inc. will adhere to the following assumptions and limitations when conducting its planned UA flight operations under an FAA issued exemption:

1. Weight
    a. The current UA weighs less than 10 pounds;
2. LOS
    a. All flights operated within visual line of sight of the PIC, per current regulations;
3. Speed
    a. Flight speeds for the current UA are not anticipated to exceed 30 knots maximum indicated airspeed, except under ideal weather conditions;
4. Flight time
    a. Due to battery limitations, maximum total flight time for each operational flight is about 15 minutes. The manufacturer's user manual claims flight times of 25 minutes, however, real-world use has demonstrated actual flight times to be closer to about 15 minutes; slightly lower in high-wind conditions. As battery capacity and storage technology improves in the near future, flight times are expected to increase;
5. Propulsion and battery
    a. The UA dynamically calculates battery reserve in real time, and displays this information to the PIC via the UAS. The UA will slowly descend to the ground if the

battery runs below a preset percentage, currently set to 15%, however, a safe landing should be planned and executed when battery life reaches 30% of maximum capacity. The attached flight manual describes battery life and battery management;

6. Altitude and elevation
    a. Flights are expected to operate below 200' above ground level (AGL) at all times, except under certain circumstances requiring geographical surveys, and/or aerial mapping where altitudes are not expected to exceed 400' AGL for brief periods of ascent, hover, and descent to capture the required imaging for mapping/geographical survey work;
7. Flight Crew
    a. Flight crew for each flight operation/mission plan, will consist of the UA Pilot who shall maintain visual LOS at all times. For larger commercial operations, and those requiring greater distances afield, a spotter may be utilized for tracking purposes, and as a safety precaution. Spotter would have the factory handheld remote as a backup control system in the event of a telemetry/communication system failure, or an exception (deviation) from the established flight plan occurs, or in the event a handoff to a second qualified PIC is required to negotiate a safe transition around a building or other obstacle, or to avoid people or animals nearby;
8. PIC
    a. The UA Pilot will be trained and well-versed in mission preparation, flight operations, and all related safety procedures as detailed in the manufacturers flight manual, applicable FARs, and company policy;
9. Mission planning and flight operations
    a. The UA will operate either within established flight plan pre-programming parameters, or flown live by the PIC using the ground control/mission planning software as part of the UAS, or manually by the PIC;
10. Location safety
    a. All locations will be appropriately investigated using aerial maps (whenever available), and in-person by flight crew personnel prior to flight operations to determine safe takeoff and landing points;
11. Briefing, planning, and debrief activities
    a. Mission briefing and de-briefing will be conducted by flight crew, including clients, whenever applicable;
12. Owner consent
    a. Verbal or written consent/permission will be obtained from the property owner(s) prior to flight operations;
13. Competency and experience
    a. Pilot will have sufficient training and experience in flight operations, operational flight characteristics of the UA, and will perform flight planning duties, such as weather briefings, NOTAMs, and any Temporary Flight Restrictions (TFR);
14. Government ordinance and permission
    a. All required permissions and permits will be obtained from federal, territorial, state, county or municipal jurisdictions;
15. Loss of communication equipment
    a. If the UA loses its GPS signal, telemetry, or fails to establish communications, it is programmed to loiter on station or hover until the battery strength runs down to the predetermined limits, then it will slowly descend to the ground per internal programming parameters. If one of the two communication downlinks are lost, the unit is programmed to fly through each of the waypoints and return to the point of origin (where the unit was powered on);

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. The UA will not carry crew or passengers, thus the level of equivalent training and experience required for Section 61.113 may be offset by adequate preparation and planning. For the proposed commercial operations, the UA will utilize the onboard GPS, programmed by the mission planning software, and monitored in real-time by the PIC, and the ground station software system/UAS responsible for the autopilot program. Planned flight areas will be controlled or restricted at all times during flight maneuvers and flight operations.

While the inherent risks associated with the relatively new class of UA are probably greater than the general public is aware, this ultimately creates the need for a safe operating environment, especially when considering commercial use. There is no fuel on board the UA, so the risk of fire is vastly diminished when compared with conventional aircraft. The FAA would be provided advance notice of any operation that will be within in controlled airspace within the National Airspace System (NAS), especially operations encroaching upon the established guidelines for unmanned aerial flight in protected airspace, and near airports.

14 C.F.R. 91.103: Preflight Action

This regulation requires the PIC to perform certain duties, and take specific actions regarding the airworthiness of the aircraft in question. An exemption is needed from this requirement as the PIC would perform preflight activities outside the scope of general aviation, and due the the physical nature and simple design characteristics of the UA.

Our UAS has several features that integrate modern flight planning, such as weather, terrain maps, satellite imagery, NOTAMS, and temporary flight restrictions (if available and issued.) Company policy requires walk-though reconnaissance of the intended flight path, noting nearby hazards and obstacles, local terrain, local animal habitation, nearby pets, and protected takeoff and landing areas. The flight manual suggests not flying near obstacles, crowds, and power lines.

In addition to the manufacturers suggested pre-flight checklist, the ultimate goal is to create a flight plan using the same procedures as a general aviation flight from start to finish.

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.

The proposed exemption includes the use of a rotorcraft that operates with similar characteristics as a helicopter. The craft is capable of vertical takeoff and landing (VTOL), and will be operating most of the time at about 10’ to 50’ AGL. There are instances where 300’ to 400” AGL may be required for brief periods. Flight maneuvers will be carried out according to the aforementioned security measures firmly in place, and include an elevated safety enclosure to prevent children and pets from accidentally wandering into the craft during takeoff and landing activities.

Although the manufacturer claims a maximum speed of up to 15 m/s (~33 MPH), they also state that it is not recommended. Certain commercial filming is likely to exceed 25 MPH for brief periods, but not on average, and only under proper atmospheric, command, and control conditions. Total gross weight is currently under 12 LBS, including payload (camera, gimbal), avionics, sound, and lighting. Careful consideration would be given with regard to terrain, and nearby obstacles during all phases of flight planning.

14 C.F.R. 91.121: Altimeter Settings

Via custom software implementation, our UA is outfitted with a barometric altimeter that is able to compensate for non-standard barometric pressures and temperatures. Field elevation may also be set manually prior to flight.

With these systems in place, an equivalent level of safety, with regard to general aviation altimeter settings, is achieved for the UA. The attached flight manual outlines operation of the factory onboard Inertial Measurement Unit (IMU), which has a built-in inertial sensor and a barometric altimeter that measures both attitude and altitude.

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

Section 91.151 (a) outlines fuel requirements for flight maneuvers under Visual Flight Rule (VFR) conditions. The UA will be flown with a known limitation pertaining to actual flight time. As mentioned earlier, this is ~12 minutes. Since planned operation is in a known area, and flight plans are flown according to predetermined headings, elevations, and attitudes, this range and flight time limitation require an exemption from 14 CFR 91.151(a).

Since the powerplant is electric, and the fuel source is a rechargeable battery, an exemption to 14 CFR §91.151 is also required due to the 30 minute fuel reserve requirement. Our current mandate is to prepare for and execute a landing as soon as possible when the battery levels reach 30% of maximum capacity. We perceive an exemption from 14 CFR §91.151 as it pertains to prior exemptions granted by your agency to Lockheed Martin Corporation, and Bechtel Corporation under FAR 91.151. Since most flight plans are estimated to be 12 minutes in length, and flown at dramatically lower altitudes than general aviation, particularly helicopters, we believe an exemption to 14 CFR §91.151 is reasonable. Similar exemptions have been granted to other operators including exemptions 2689F, 5745, 10673, 10808, and 11258 (for reference.)

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

These regulations require that an aircraft operator "*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 . . .*"

Airworthiness inspections under Part 43 are generally granted to general aviation aircraft, particularly those possessing a valid airworthiness certificate. The UA does not have many moving parts, aside from the four electric motors powering the rotor blades. Maintenance and inspections will fall under the responsibility of the flight team, and ultimately the PIC. In addition to pre-flight activities that may indicate repairs, any in-flight issues that arise will result in the immediate safe descent and landing of the UA. The inherent design characteristics, and small size of the UA make flight nearly impossible with even the slightest component failure, thus, proper maintenance and airworthiness is paramount for safe flight maneuvers.

Additionally, with low flight altitudes, a safely controlled flight environment and LOS restrictions, an equivalent level of safety is obtained to prevent harm to any people, animals, or structures in the vicinity. Furthermore, the limited payload and battery life only allow for shorter flights, and are in LOS of the PIC at all times which allow for brief flight plans that exercise more stringent flight operations.

Since the PIC is ultimately responsible for the airworthiness of the aircraft, and also responsible for a go/no-go takeoff decision, this individual is best suited to maintain the aircraft or suggest

maintenance/repair procedures which may terminate a flight plan, or those necessary prior to the next flight.

Privilege of utilizing exemption outside the continental U.S.

We have no plans to operate outside of the United States at present.

Summary of Research Laboratories, Inc, Section 333 request for exemption for publication in the Federal Register

Per 14 C.F.R. Part 11, the following summary is provided for publication in the Federal Register, if publication is necessary:

Applicant seeks an exemption from the following rules and regulations
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); 91.417 (a) & (b) for commercial operation of small unmanned vehicles (55 lbs. or less.)

Pursuant to the guidelines and mission outlined in Section 333 of the Reform Act of 2012, specifically related to the size, weight, operational characteristics, flight in proximity to national airspace, controlled airspace, altitudes near airports, crowds, and line-of-sight restrictions, we feel that this appeal provides sufficient rationale for the grant of the requested exemption to allow commercial operation of this applicant's UA for providing aerial information services to include images, video, and geographical survey work (mapping services) for closed-set motion picture, television, and film production capacities, and also for a broad range of clients in the residential, commercial, and industrial sectors.

Additional supporting documentation

Our CEO has extensive experience in enterprise software systems, particularly with the Northrop Grumman Joint Mission Planning System (JMPS), used by the U.S. Navy, U.S. Air Force, and U.S. Coast Guard. Aircrew use JMPS to conduct detailed mission planning to support a full spectrum of missions, ranging from simple training to complex combat scenarios. Aircrew save the required aircraft, navigation, threat, and weapons data on a data transfer device that they load into the aircraft prior to flight, as well as programming waypoints, fuel, and payload.

Additionally, at the time of this writing, he has obtained over 100 hours of ground instruction in Private Pilot, Helicopter/Rotorcraft, and Human Factors ground school in Aviation, including 45 hours of simulator time, and over 22 hours practical time counted toward the private pilot rating. Written exams are scheduled for May 25 and May 27, for the FAA Private Pilot and Helicopter/Rotorcraft, respectively; FAA Private Pilot checkride is anticipated to be scheduled on or around July 1, 2015, and the Helicopter/Rotorcraft checkride to follow in late Autumn.

1. Supplemental response for petition
2. PHANTOM2_User_Manual_v1.4_en
3. PHANTOM_Flying_Flowchart_v1.0_en
4. Smart_Flight_Battery_Safety_Guidelines