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

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

May 15, 2015

Exemption No. 11595
Regulatory Docket No. FAA–2015–0479

Mr. Gary J. Huett
8270 Cordry Drive
Nineveh, IN 46164−9251

Dear Mr. Huett:

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 posted to the docket on February 26, 2015, you petitioned the Federal Aviation Administration (FAA) for an exemption. The exemption would allow the petitioner to operate an unmanned aircraft system (UAS) to conduct aerial videography and cinematography.

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. 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. Gary J. Huett is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b), to the extent necessary to allow the petitioner to operate a UAS to perform aerial data collection. This exemption is subject to the conditions and limitations listed below.

Conditions and Limitations

In this grant of exemption, Mr. Gary J. Huett 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 5 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 May 31, 2017, unless sooner superseded or rescinded.

Sincerely,

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

Enclosures

U. S. Department of Transportation
Docket Management System
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From:

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Re: Exemption Request Section 333 of the FAA Reform Act of the Federal Aviation Regulations from: **14 C.F.R. 45.23(b); 14 C.F.R. Part 21;14 C.F.R. 61.113(a)&(b); 91.7(a); 91.9(b) (2); 91.103(b); 91.105; 91.109; 91.119; 91.121; 91.151(a); 91.203(a)&(b); 91.405(a); 91.407(a) (1); 91.409(a) (2); 91.417(a)&(b)**

Dear Sir or Madam,

I, Gary Huett, herewith known as the petitioner, am writing pursuant to the FAA Modernization and Reform Act of 2012 and the procedures contained within 14 C.F.R. 11, to request that I, an owner and operator of small unmanned aircraft, be exempted from the Federal Aviation Regulations ("FARs") listed below so that I may operate my small ultra light weight unmanned aircraft system ("sUAS") commercially in airspace regulated by the Federal Aviation Administration ("FAA").

The petitioner has been an active private pilot for over 20 years with over 550 hours logged, Certificate Number: 3505115, with a current Medical Certificate Third Class, Applicant ID: 1996425753. I also have a BS and MS degree in Aeronautical Engineering with the master's degree being in Air Transportation Systems. I have been involved professionally in videography in various capacities over the years. I have experience flying RC aircraft and in particular have been flying RC quadcopters for over one and a half years and other RC aircraft prior to that. I have over 100 hours experience flying RC quadcopters of the type referenced here.

The petitioner has added a hobby grade quadcopter sUAS with an integrated still/video camera system to my inventory with intent for aerial videography/cinematography to enhance academic community awareness, augment real estate listing videos, document accident scene locations, mapping, crop surveying, inspections and other flight operations, following exemption and approval by the FAA. The petitioner plans to add a second quad-copter to their inventory in the future with comparable or enhanced safety capabilities based on the latest technology.

The petitioner has instilled safety protocols and controls to avoid and prevent public hazard. The petitioner believes that his unique background of aeronautical engineering, piloting and

professional videography can assist the FAA in developing operational and safety protocols for lightweight UAS's as their integration into the national airspace system is explored and developed. This unique foundational experience and analysis can be used to record flight data and other information gained through permitted flight operations to share with the FAA through any required FAA reports to assist with the development of future protocol and safety regulation. The petitioner has noticed that most exemptions have been granted to professional cinematography companies primarily on the west coast. The petitioner believes that with his aeronautical engineering background and other related qualifications he can greatly contribute to the FAA in exploring the proper integration of the UAS into the NAS in other non-professional cinematography commercial applications. The applications outlined in this request are not primarily directed towards professional cinematography but mainly smaller commercial community based operations of the UAS. The petitioner believes that his exemption would provide the FAA with an analytical, expanded and diverse UAS experience to help establish the necessary requirements and protocols for the safe operation of such aircraft systems [UAS's] in the wide variety of application in the national airspace system.

I am interested in operating small unmanned aircraft systems (sUAS) commercially in airspace regulated by the Federal Aviation Administration (FAA) for the purposes of aerial photography, videography/cinematography, mapping, crop surveying, accident reconstruction, inspections and other responsible flight operations that could be performed safely and more cost effectively with the use of a small sUAS at low altitude within the U.S. national airspace system as compared to a manned aircraft. Commercial operations will be performed only at the request of and with the authorization and permission of clients, communities or their authorized agents in order to facilitate commerce and raise awareness of the responsible and beneficial uses of small unmanned air systems. 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.

Granting my request comports with the Secretary of Transportation's (FAA Administrator's) responsibilities and authority to not only integrate UAS's into the national airspace system, but to "...establish requirements for the safe operation of such aircraft systems [UAS's] in the national airspace system" under Section 333(c) of the Reform Act specific to the use of UAS's for real estate and other community related purposes. Further I will conduct my operations in compliance with the protocols described herein or as otherwise established by the FAA.

For the reasons stated below the petitioner respectfully requests the grant of an exemption allowing me to operate ultra light weight, remote controlled UAS's for academic community awareness to benefit/enhance attraction to the community, to enhance real estate listing videos for home or business owners who cannot afford expensive manned aircraft for the same purpose, investigate/document accident sites long after the accident occurred for reconstruction and analysis purposes, aerial mapping, crop surveying, inspections and other flight operations. All of which will promote local economic growth through increased employment and increased tax base. All with public safety in mind by replacing heavier manned aircraft containing combustible fuel that poses potential public hazard.

I. Contact Information:

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II. The Specific Sections of Title 14 of the Code of Federal Regulations From Which The Petitioner Requests Exemption are:

14 C.F.R. 45.23(b);	Aircraft markings
14 C.F.R. 21; Subpart H	Certification procedures; Airworthiness Certificates
14 C.F.R. 61.113(a)&(b);	Pilots, Flight Instructors and Ground Instructors
91.7(a);	Airworthiness certificate
91.9(b) (2);	Aircraft flight manual
91.103(b)(2);	Preflight action
91.105;	Flight crew members at stations
91.109;	Flight instruction
91.119;	Minimum safe altitudes
91.121;	Altimeter settings
91.151(a);	Fuel requirements for flights in VFR conditions
91.203(a)&(b);	Aircraft certifications and registrations
91.405(a);	Maintenance required
91.407(a) (1);	Operation after maintenance
91.409(a) (1) &(2);	Inspections
91.417(a)&(b)	Maintenance records

III. The Extent Of Relief The Petitioner Seeks And The Reason He Seeks Such Relief:

These are in accordance with FAA Publication: Public Guidance for Petitions for Exemption Filed under Section 333 (Rev. 9/25/14). The petitioner submits this application in accordance with the Reform Act, 112 P.L. 95 §§ 331-334, seeking relief from any currently applicable FARs operating to prevent the petitioner from contemplated commercial videographic, academic and other flight operations within the national airspace system (NAS). The Reform Act in Section 332 provides for such integration of civil unmanned aircraft systems into our national airspace system as it is in the public's interest to do so. The petitioner's ultra light weight sUAS meets the definition of "small unmanned aircraft" as defined in Section 331 and therefore the integration of my ultra lightweight sUAS is expressly contemplated by the Reform Act. I would like to operate my ultra lightweight sUAS prior to the time period by which the Reform Act requires the FAA to promulgate rules governing such craft. My aeronautical engineering, piloting and videography background applied to UAS's can provide direct experience and valuable information to develop requirements and protocols for formal regulation that can be administered regarding various applications related to UAS aerial video and photography. The Reform Act guides the Secretary in determining the types of UAS's that may operate safely in our national airspace system. Considerations include: The weight, size,

speed and overall capabilities of the UAS's; Whether the UAS will be operated near airports or heavily populated areas; and, whether the UAS will be operated by line of sight. 112 P.L. 95 § 333 (a). Each of these items reflect in favor of an exemption for the petitioner.

Similar exemptions to Astraeus Aerial (No. 11062) and Douglas Trudeau (No. 11138) as well as others have been recently granted that cover the same relief from regulations as requested in this petition for exemption. The above two, amongst other, petitions have been reviewed with the petitioner's exemption being substantially similar to that of Douglas Trudeau in use of the UAS for local community related matters rather than professional movie making.

A. 14 C.F.R. 21 and 14 C.F.R. 91: Airworthiness Certificates, Manuals and The Like.

14 C.F.R. 21, Subpart H, entitled Airworthiness Certificates, sets forth requirements for procurement of necessary airworthiness certificates in relation to FAR § 91.203(a)(1). The size, weight and enclosed operational area of the petitioners UAS permits exemption from Part 21 because the UAS meets (and exceeds) an equivalent level of safety pursuant to Section 333 of the Reform Act. The FAA is authorized to exempt aircraft from the airworthiness certificate requirement 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 populations. The petitioners UAS meets or exceeds each of the elements.

14 C.F.R. 91.7(a) prohibits the operation of an aircraft without an airworthiness certificate. As no such certificate will be applicable in the form contemplated by the FARs, this regulation is inapplicable. Proper maintenance will be regularly applied to keep the UAS airworthy.

14 C.F.R. § 91.9 (b) (2) requires an aircraft flight manual in the aircraft. As there are no on board pilots or passengers, and given the size of the UAS's, this Regulation is inapplicable. An equivalent level of safety will be achieved by maintaining a safety/flight manual as presented in this document delineating areas of where safety can be defined. The FAA has previously issued exemptions to this regulation in Exemption Nos. 8607, 8737, 8738, 9299, 9299A, 9565, 9565B, 10167, 10167A, 10602, 10700 and 32827.

14 C.F.R. § 91.121 regarding altimeter settings is inapplicable insofar as my UAS has no altimeter settings. It, however, utilizes electronic global positioning systems with a barometric sensor providing instantaneous telemetry to the PIC as to the altitude (AGL) of the UAS above the takeoff location.

14 C.F.R. § 91.203 (a) and (b) provides for the carrying of civil aircraft certifications and registrations. They are inapplicable for the same reasons described above. The equivalent level of safety will be achieved by maintaining any such required certifications and registrations by the petitioner.

B. 14 C.F.R. § 45.23: Marking of The Aircraft.

Applicable Codes of Federal Regulation require aircraft to be marked according to certain specifications. My UAS is, by definition, unmanned. It, therefore, does not have a cabin, cockpit or pilot station on which to mark certain words or phrases. Further, two-inch lettering is difficult to place on such small aircraft with dimensions smaller that minimal lettering requirement. Regardless, I will mark the UAS in the largest possible lettering by placing an N number registered with the FAA on its fuselage so that I the pilot, or anyone assisting me as a spotter with the UAV will see the markings. The FAA has previously issued exemptions to this regulation through Exemptions Nos. 8738, 10167, 10167A and 10700.

C. 14 C.F.R. § 61.113: Private Pilot Privileges and Limitations: PIC.

Pursuant to 14 C.F.R. §§ 61.113 (a) & (b), private pilots are limited to non-commercial operations. The petitioner can achieve an equivalent level of safety as achieved by current regulations because my UAS does not carry any pilots or passengers. Further, while helpful, a commercial pilot license will not ensure remote control piloting skills. However, the PIC is a licensed Private Pilot with a current Third Class Medical Certificate. The PIC also possesses over 100 hours experience flying the UAS in a variety of locations and conditions. The risks attendant to the operation of my UAS are far less than the risk levels inherent in the commercial activities outlined in 14 C.F.R. § 61, et seq. Thus, allowing the petitioner, a licensed Private Pilot with a current Third Class Medical Certificate to operate my UAS commercially meeting and exceeding current safety levels in relation to 14 C.F.R. §61.113 (a) & (b).

D. 14 C.F.R. 91.105: Flight Crew Members at Stations

Since there is no flight crew onboard the UAS, the above-cited regulation is inapplicable. However, in keeping with the direction of the regulation, the PIC of the UAS and VO will be at their respective crewmember stations on the ground during takeoff and landing as well as the complete duration of the flight.

E. 14 C.F.R. 91.119: Minimum Safe Altitudes.

14 C.F.R. § 91.119 prescribes safe altitudes for the operation of civil aircraft. It allows helicopters to be operated at lower altitudes in certain conditions. My UAS will never operate at an altitude greater than 400 feet AGL unless other altitude limits are forthcoming by the FAA. The petitioner will operate the UAS in a manner protecting the public and any consenting participants, providing a level of safety at least equivalent to or below those in relation to minimum safe altitudes. Given the size, weight, maneuverability and speed of my UAS, an equivalent or higher level of safety will be achieved.

F. 14 C.F.R. 91.405 (a); 407 (a) (1); 409 (a)(1)&(2); 417(a) & (b): Maintenance Inspections.

The above-cited Regulations require, amongst other things, aircraft owners and operators to "have [the] 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. . . ." These Regulations only apply to aircraft with an airworthiness certificate. They will not, therefore, apply to the petitioners UAS. However, as a safety precaution I inspect my UAS regularly as well as before and after each flight and have a maintenance program that involves regular software updates and curative measures for any damaged hardware. Therefore, an equivalent level of safety will be achieved.

IV. How The Petitioners Request Will Benefit the Public As A Whole:

Aerial videography for geographic, community awareness, real estate marketing, documenting accident scene locations, mapping, crop surveying, inspections and other flight operations has been around for many years through manned fixed wing aircraft and helicopters. For small budget operations, local community awareness and the average business/homeowners, the expense and operation of such aerial videography can be both cost and logistically prohibitive. Only large companies, large farms and high-end realtors or luxury homeowners can afford to absorb such expense. In addition, attempting to get still photos, much less high quality, stabilized video of a community, home, farm, or business is often logistically difficult or impossible using a full size aircraft or helicopter due to flight restrictions, ground proximity, trees and other hindrances, not to mention highly intrusive noise levels and other drawbacks to the neighboring community. Also, the physical logistics of maneuvering a full sized fixed wing aircraft or helicopter adds an element of risk and danger due to the possibility of crashing and ensuing fire. The proper use of an ultra lightweight, battery powered, GPS stabilized, UAS removes that element of danger, while at the same time making available the opportunity to acquire high quality images and video to the community at an economical cost. New perspectives and creative presentations of features of the community are made available that were not previously possible. This opens up a whole new economic avenue for community awareness, development and enhancement in many areas, some yet to be explored and discovered, similar to the advent of aviation. The lower cost and greater utility facilitates a whole new dimension to community related presentation options that were previously not available.

Congress has already proclaimed that it is in the public's interest to integrate commercially flown UAS's into the national airspace system, hence the passing of the Reform Act. Granting the petitioners exemption request furthers the public interest through academic/visual awareness, decreased risk to the public and newly accessible scales of economy. My ultra lightweight UAS is battery powered and creates no emissions that can harm the environment. The consequence of my ultra lightweight UAS crashing is far less than a full size helicopter or fixed wing aircraft; which are heavy, contain combustible fuel and can cause catastrophic devastation to the public. Due to their size, limited maneuverability, and flight limitations manned aircraft also cannot provide the community with the versatile, high quality, stabilized video/cinematography that can be gained through the responsible operation of a small UAS.

Some specific areas where the petitioner's use of a UAS may benefit the public as a whole are:

- Aerial videography/cinematography to enhance academic community awareness - community events, outdoor functions, business promotions, video productions
- Augment real estate listing videos - provide a more expansive view of large properties, show proximity to other geographic and community features, enhance buyer awareness
- Document accident scene locations - provide high definition, measurable photos taken days, months or years after the incident to document distances, skid marks, gouges, and other physical artifacts to assist in reconstructing accidents
- Mapping – Aerial mapping of areas for geographic and surveying purposes
- Crop surveying – provide detailed analysis of crop areas to apply the proper amount of fertilizer, insecticide, etc. limiting excessive blanket application causing undo runoff polluting lakes, rivers, streams, foliage and wildlife
- Inspections – inspect water towers, roofs, snow-mass on roofs, bridges and other facilities not readily accessible, thus removing potential physical risk to someone having to climb the object to inspect it.
- Other flight operations – other areas that may develop

The public's interest is furthered by minimizing ecological and crash threat by permitting aerial video/photo capture through my battery operated ultra lightweight UAS. Permitting the petitioner to immediately fly within national air space stimulates economic growth in the community. In addition, due to my aeronautical engineering background, the petitioner can knowledgeably relate back to the FAA valuable input to establish requirements and protocols for the proper integration of UAS's into the national airspace system.

V. Reasons Why Granting the Petitioners Exemption Will Not Adversely Affect Safety Or How The Exemption Will Provide a Level of Safety At Least Equal To Existing Rule:

The following information is provided for the FAA to effectively analyze the petitioner's sUAS operation with regard to safety:

A. Regarding The Unmanned Aircraft System (UAS)

My battery operated sUAS utilizes four (4) counter-rotating propellers for propulsion, integrated with a three-axis self-stabilizing control system augmented with GPS. My UAS is equipped with GPS, Intelligent Orientation Control (IOC) and auto return safety technology. Weighing less than five (5) pounds (far below the maximum 55 pound limit); including camera with gimbal.

<u>The Petitioner's sUAS Characteristics:</u>

DJI Phantom 2 Vision +
Model No. PV331
Serial Number: PH645233374 V2.0

- Gross weight of less than 3 pounds including camera and battery
- FCC approved 2.4 GHz transmitter/controller/receiver Radio Frequency (RF) spectrum for controlling sUAS flight

- FCC approved 5.8 GHz RF spectrum EIRP transmitting power of 100 mW for dedicated wifi transmitter/receiver between sUAS, Range Extender attached to transmitter and mobile viewing device displaying operational telemetry and video/photography functions including:
    - Digital and analog battery level indicator with low battery warnings
    - Number of satellites being received by the sUAS to verify GPS lock
    - Wifi signal intensity
    - Range Extender battery level
    - sUAS altitude in feet above take-off location (home point)
    - sUAS distance in feet from take-off location (home point)
    - sUAS speed in mph
    - Flight attitude and radar function indicating yaw orientation of sUAS and graphical direction and distance from take-off location (home point)
    - Verification of micro-SD recording card in sUAS
    - Remaining number of photos available on micro-SD card
    - Indication of photo or video recording in progress
- Cruising speed of 15 knots, with a maximum speed of 29 knots
- Maximum flight time is 25 minutes
- Audible and visual sequential low battery warnings are set at 30% charge and 15% charge remaining. The sUAS automatically initiates landing sequence at 15% charge while still under PIC control
- Software allows setting maximum altitude (AGL) and distance sUAS can fly from home point to automatically restrict altitude and range as needed
- Vertical height limitation can be set for maximum of 400 feet AGL to aid in VLOS (unless new regulations allow 500 feet)
- Lateral radius distance from controller can be set for maximum of 1000 feet to aid in VLOS
- Firmware in sUAS provides airport vicinity no-fly feature and limited altitude feature under restricted airspace
- Return Home and land itself feature if it loses transmitter control signal
- Flight testing in open rural areas has proven that having the firmware programmed for maximum 400 feet AGL and 1000 feet distance are adequate for maintaining VLOS without assistance of binoculars or other assistance. Most intended operation will be less than 200 feet AGL and 500 feet lateral distance.
- Intelligent Orientation Control (IOC) Home Lock mode option on the controller allows the PIC to activate this function and initiate pull back on the directional control and the sUAS will come back to PIC's location no matter what direction it is facing.

Firmware upgrades provided by the manufacturer will be regularly maintained for:

- Main Controller
- GPS
- Receiver
- Battery
- Zen IMU

Additional specifications and operational information is available in the attached (Appendix A - Phantom 2 Vision Plus User Manual v1.8)

Safety Procedures.

The petitioners exemption will not adversely affect safety. Quite the contrary, for the reasons stated permitting the petitioner to log more flight time in FAA controlled airspace, with communication with the FAA, if desired, will allow me to contribute to the innovation and implementation of new and novel, as of yet undiscovered safety protocols for UAS's in cooperation with the FAA. In addition the petitioner submits the following representations of safety enhancements to current aerial videography and photography for aerial videography/cinematography to enhance academic community awareness, augment real estate listing videos, document accident scene locations, mapping, crop surveying, inspections and other flight operations:

- My UAS weighs less than 5 pounds including the three-axis stabilized gimbal and integrated camera;
- I regularly inspect the physical components of the UAS such as frame, motors and propellers prior to each flight to make sure it is ready for flight;
- I regularly verify the condition of the flight batteries using software provided by the manufacturer;
- I repair or replace any questionable or faulty components to maintain air worthiness;
- I regularly calibrate the Inertial Measurement Unit (IMU) using provided software;
- I only operate my UAS below 400 feet (within the permissible ceiling set by the FAA Modernization and Reform Act of 2012);
- I only operate the UAS in visual meteorological conditions;
- My UAS can operate for 20-25 minutes per flight, but my flights will be typically limited to 10–15 minutes for safety purposes, landing prior to 30% remaining battery charge to provide a safety buffer;
- My UAS provides digital (numeric) and analog (progress bar) telemetry of remaining battery life;
- It provides two sequential indications of low battery power with audible warnings and visual red flashing on my telemetry;
- If the second, lower level of battery warning is reached, it automatically begins to descend to a landing, which the pilot can control. This prevents it from falling out of the sky due to battery drain, causing potential damage;
- I pilot my UAS through remote control only by visual line of sight (VLOS);
- I use a visual observer for any commercial operations if necessary;
- My UAS has GPS along with built in stability control, a flight safety feature whereby it hovers in place when the control sticks are released;
- The GPS also provides a Return To Home feature causing the UAS to return automatically to its take off or home point then slowly land itself if communication with the remote control PIC is lost;
- I actively analyze flight data, experience and other sources of information to constantly update and enhance safety protocols;
- I actively engage in dedicated online UAS forums to stay up to date with operational, technical and regulatory issues from others and assist others in their flight experience and questions.

- I only operate in reasonably safe environments that are strictly controlled, are away from power lines, elevated lights, airports and actively populated areas;
- I conduct extensive pre-flight inspections and operational protocol, during which safety carries primary importance;
- After takeoff I immediately verify that the UAS is operating properly by observing it's response to all controls and telemetry prior to proceeding on my flight;
- I always obtain all necessary permissions prior to operation;
- I have enough varied flight experience with the sUAS to know when to abort flights in the event of safety breaches or potential danger;
- If any repairs are done, the sUAS is extensively bench and flight tested prior to any commercial operations to verify normal operation;
- I have over 100 hours flight experience in a wide variety of situations with this sUAS;
- Training sessions are regularly done to maintain proficiency and increase piloting skills;
- I accomplish 3 take-offs and landings in the preceding 90 days (for currency purposes).
- I have developed (and continue to develop) a Safety Protocols and Controls document (see Appendix B) for use prior to each flight;
- I have a Flight Safety Manual checklist (see Appendix C) filled out prior to each commercial flight.
- I have a PHANTOM Flying Flowchart (see Appendix D) at all flights for reference.

The petitioner's safety protocols provide a level of safety equal to or exceeding existing rules. It is important to note that absent the integration of commercial UAS into our national airspace system, helicopters are the primary means of aerial video and photography for community awareness, real estate and other applications. While the safety record of such helicopters is remarkably astounding, there have been incidents involving loss of life as well as extensive property damage; it is far safer to operate a battery powered ultra light weight sUAS.

- First, the potential loss of life is diminished because UAS's carry no people on board who could be hurt or killed in the event of a crash, not to mention the risk to those on the ground.
- Second, there is no fuel on board a UAS and thus the potential for fire or explosions is greatly diminished and at a much smaller scale.
- Third, the small size, constant visual acquisition, and extreme maneuverability of my UAS allow me to identify and pilot away from and avoid hazards quickly and safely.
- Lastly, given its small size and weight, a potential crash is likely to cause little or no damage as compared to a helicopter.

Accordingly, my sUAS has been experimentally operated for familiarization/competency and will continue to operate at and above current safety levels.

B. Regarding The Unmanned Aircraft PIC

The petitioner (PIC) has been an active VFR private pilot for over 20 years with over 550 hours logged, Certificate Number: 3505115 and has met the flight review requirements specified in 14 CFR 61.56 in an aircraft in which the PIC is rated on his pilot certificate. He also has a current Medical Certificate Third Class, Applicant ID: 1996425753. The petitioner has over 100 hours flight experience in a wide variety of training, proficiency, and experience-

building flights with this sUAS, including evasive and emergency maneuvers and maintaining appropriate distances from people, vessels, vehicles and structures.

UAS operations must be conducted by a PIC possessing at least a private pilot certificate and at least a current third-class medical certificate. 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.

Prior to operations conducted for the purpose of aerial videography/cinematography to enhance academic community awareness, augment real estate listing videos, document accident scene locations, mapping, crop surveying, inspections (or similar operations), the PIC must have accumulated and logged, in a manner consistent with 14 CFR 61.61(b), a minimum of 25 hours of total time as a UAS rotorcraft pilot including at least 10 hours logged as a UAS pilot with a multi-rotor UAS. Prior documented flight experience that was obtained in compliance with applicable regulations may be used to satisfy this requirement. Training, proficiency, and experience-building flights will also be conducted to accomplish the required flight time. However, said training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights the PIC is required to operate the UA with appropriate distances in accordance with 14 CFR 91.119.

Prior to operations conducted for the purpose of aerial videography/cinematography to enhance academic community awareness, augment real estate listing videos, document accident scene locations, mapping, crop surveying, inspections (or similar operations), the PIC must have accumulated and logged, in a manner consistent with 14 CFR 61.51(b), a minimum of 5 hours as UAS pilot operating the make and model of the UAS to be used in operations under the exemption; 5 hours make and model time may be included in the 10 hours of multi-rotor time prescribed above. The PIC must accomplish 3 take-offs and landings in the preceding 90 days (for currency purposes). Training, proficiency, experience-building, and take-off and landing currency flights are conducted only during dedicated training sessions to accomplish the required flight time and 90 day currency. During training, proficiency, and experience-building flights the PIC is required to operate the UA with appropriate distances in accordance with 14 CFR 91.119.

The operator may not permit the PIC to operate the UAS for the purpose of aerial videography/cinematography to enhance academic community awareness, augment real estate listing videos, document accident scene locations, mapping, crop surveying, inspections (or similar operations), unless the PIC has demonstrated and logged in a manner consistent with 14 CFR 61.51(b), the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under the desired exemption, including evasive and emergency maneuvers and maintaining appropriate distances from people, vessels, vehicles and structures.

C. Regarding The Operation of the Unmanned Aircraft

The petitioner considers safety as foremost with each flight. My small unmanned aircraft is designed to hover in place via GPS in order to hold location and elevation and operate in less than a 24 knot (27.6 mph) wind. For safety, stability and fear of financial loss I will not fly in

winds exceeding 20 mph. Built-in safety systems include an integrally stabilized GPS mode that allows my sUAS to hover in place when radio controls are released. With three control modes to choose from, I utilize the *Smart Mode* for aerial videography/photography. This is the safest, most reliable and stable mode complementing the pilot's skills to prevent accident and hazard. It allows that if directional orientation of the sUAS in flight is ever an issue I can switch to IOC Home Lock mode and just pull back on the controls and it will come back to my location no matter what direction it is facing. When pilot communication is lost, the UAS is designed to return to the point of take off and slowly descend, landing itself if necessary, or the pilot may retake control of it. I do not operate my UAS near airports (unless proper communication and approval has been secured), hospitals nor police heliports, and do not operate near areas where the general public is placed in a hazardous situation depending on location, conditions and weather. Current software has integrated no-fly zones preventing the sUAS from taking off or limiting its altitude to remain under controlled airspace. This software is updated regularly by the manufacturer and installed by the petitioner. I am constantly on alert for any manned aircraft (police/medical helicopters, etc.) and prepared to land/abort immediately to the nearest and safest ground point should a manned aircraft approach my location or I suspect a manned aircraft may approach near my location. My sUAS is capable of vertical and horizontal operations, and is flown only within my line of sight, as the remote control pilot (PIC). Utilizing battery power rather than combustible fuels, flights generally last between ten (10) to eighteen (18) minutes allowing at least 30 percent charge remaining in the battery at landing, with an altitude under four hundred (400) feet (or current FAA regulations), with most flights not exceeding two hundred (200) feet.

The petitioner utilizes a fresh fully charged battery with each flight as a safety precaution; full flight time limit for each battery is twenty (20) to twenty-five (25) minutes. Remaining battery life is constantly displayed with telemetry provided to the PIC as to the state of the charge of the battery with percentage of battery charge showing both in digital and analog. The health of the battery is regularly checked using manufacturer provided computer software prior to flights. I do not operate my sUAS at or below manufacture recommend minimum charge levels for operation; preferring to remain well within a safe operating range to insure adequate communication between the PIC and sUAS to eliminate potential for crash, loss of control or hazard. During operation, two sequential low-voltage (low battery) alerts are issued visually and audibly. All flights will be concluded prior to the first low battery warning of 30% remaining charge. Also, the sUAS has an automated function which results in immediate automatic landing when a low battery (15% battery level warning) is detected. Reserve batteries are always at hand with each flight to insure easy replacement for sufficient safe level of operation and eliminate any need to be inclined to push the battery limits for extended flight time. I do not believe in taking a risk that may cause a crash that could create hazard to the public/property/manned aircraft, and have no desire to lose an investment. I have flown over 100 hours of flight time as a hobbyist simulating flights for future commercial use to gain familiarization and flight proficiency with the characteristics of this specific sUAS's flight, battery and video camera performance under different temperature, wind and weather conditions.

The petitioner is extremely responsible and cautious, exercising situational awareness, when operating my UAS/ultra light weight unmanned aircraft and will not "create a hazard to users

of the national airspace system or the public." 112 P.L. 95 § 333 (b). Given the small size and weight of my sUAS, it falls well within Congress's contemplated safety zone when it promulgated the Reform Act and the corresponding directive to integrate sUAS's into the national airspace system. The petitioner's sUAS, used in hobby flight, has a demonstrable safety record and does not pose any threat to the general public or national security.

The petitioner desires to operate the UAS for the purpose of aerial videography/cinematography to enhance academic community awareness, augment real estate listing videos, document accident scene locations, mapping, crop surveying, inspections (or similar operations).

Operations authorized by the desired grant of exemption are limited to the following aircraft described in the operating documents which is a quad-rotor aircraft weighing less than 3 pounds: PHANTOM 2 Vision+ Unmanned Aircraft System. Proposed operations of any other aircraft will require a new petition or a petition to amend the grant.

The sUAS will not be flown at an indicated airspeed exceeding 30 knots.

The sUAS will be operated at an altitude of no more than 400 feet above ground level (AGL) (or within current FAA altitude regulations should it be changed), as indicated by the procedures specified in the operating documents. All altitudes reported to ATC must be in feet AGL.

The sUAS will be operated within visual line of sight (VLOS) of the Pilot In Command (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.

All operations will utilize a visual observer (VO). The sUAS will be operated within the visual line of sight (VLOS) of the 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 will be able to communicate verbally at all times. The PIC will be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC will ensure that the VO can perform the functions prescribed in the operating documents.

The operating documents and the grant of exemption will be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in the exemption and the procedures outlined in the operating documents, the conditions and limitations in the exemption take precedence and must be followed. Otherwise, the operator will 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 upon request. The operator will also present updated and revised documents if he 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 will petition for amendment to its grant of exemption. The FAA's UAS Integration Office (AFS-80) will be contacted if questions arise regarding updates or revisions to the operating documents.

Prior to each flight, the PIC will inspect the UAS to ensure it is in a condition for safe flight. If the inspection reveals a condition that affects the safe operation of the UAS, the UAS will be prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight. The Ground Control Station will be included in the preflight inspection. All maintenance and alterations will be properly documented in the aircraft records.

Any UAS maintenance or alterations that affect the UAS operation or flight characteristics, e.g. replacement of a flight critical component, will undergo a functional test flight. The PIC who conducts the functional test flight will make an entry in the aircraft records.

The pre-flight inspection section in the operating documents will account for all discrepancies, i.e. inoperable components, items, or equipment, not already covered in the relevant sections of the operating documents.

The operator will follow the UAS manufacturer's aircraft/component, maintenance, overhaul, replacement, inspection, and life limit requirements.

The operator will carry out its maintenance, inspections, and record keeping requirements, in accordance with the operating documents. Maintenance, inspection, and alterations will be noted in the aircraft records, including total flight hours, description of work accomplished, and the signature of the authorized person returning the UAS to service.

Each UAS operated under the exemption will comply with all manufacturer Safety Bulletins.

The authorized person will make an entry in the aircraft record of the corrective action taken against discrepancies discovered between inspections.

UAS operations will not be conducted during night, as defined in 14 CFR 1.1. All operations will be conducted under visual meteorological conditions (VMC).

The UAS will not operate within 5 nautical miles of an airport reference point as denoted on a current FAA-published aeronautical chart unless appropriate contact with the airport and any other required agencies has been done and approval has been granted.

The UAS will 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.

If the UAS loses communications or loses its GPS signal, it will return to a pre- determined location within the planned operating area and land or be recovered in accordance with the

operating documents.

The PIC will abort the flight in the event of unpredicted obstacles or emergencies in accordance with the operating documents.

The PIC will not begin a flight unless (considering wind and forecast weather conditions) there is enough power to fly at normal cruising speed to the intended landing point and land the UAS with 30% battery power remaining.

The operator will obtain an Air Traffic Organization (ATO) issued Certificate of Waiver or Authorization (COA) prior to conducting any operations under the desired grant of exemption. This COA will also require the operator to request a Notice to Airman (NOTAM) not more than 72 hours in advance, but not less than 48 hours prior to the operation.

The sUAS operated in accordance with the desired exemption will 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 will be as large as practicable.

The documents required under 14 CFR 91.9 and 91.203 will be available to the PIC at the Ground Control Station of the UAS any time the UAS is operating. These documents will be made available to the Administrator or any law enforcement official upon request.

The UAS will remain clear and yield the right of way to all manned aviation operations and activities at all times.

The UAS will not be operated by the PIC from any moving device or vehicle.

Flight operations will be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures unless:

1. Barriers or structures are present that sufficiently protect nonparticipating persons from the UA and/or debris in the event of an accident. The operator will 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 UAS, flight operations will cease immediately and/or;
2. The aircraft is operated near vessels, vehicles or structures where the owner/controller of such vessels, vehicles or structures has granted permission 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, and;
3. Operations nearer to the PIC, VO, operator trainees or essential persons do not present an undue hazard to those persons per § 91.119(a).

Caution signs will be placed to warn people to stay back due to aerial photography in progress. (see Appendix E – Warning Sign)

All operations will be conducted over private or controlled-access property with permission from the land owner/controller or authorized representative. Permission from land owner/controller or authorized representative will be obtained for each flight to be conducted.

Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA will be reported to the FAA's UAS Integration Office (AFS-80) within 24 hours. Accidents will be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.ntsb.gov.

VI. A Summary The FAA May Publish in the Federal Register:

14 C.F.R. 21 and 14 C.F.R. 91: Airworthiness Certificates, Manuals and The Like. 14 C.F.R. 21, Subpart H, entitled Airworthiness Certificates, sets forth requirements for procurement of necessary airworthiness certificates in relation to **FAR § 91.203(a)(1).** The size, weight and limited operational area of my UAS permits exemption from Part 21 because the petitioner's UAS meets an equivalent level of safety pursuant to Section 333 of the Reform Act. The FAA is authorized to exempt aircraft from the airworthiness certificate requirement 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 populations. My UAS meets or exceeds each of the elements. **14 C.F.R. 91.7(a)** prohibits the operation of an aircraft without an airworthiness certificate. As no such certificate will be applicable in the form contemplated by the FARs, this Regulation is inapplicable. **14 C.F.R. § 91.9 (b) (2)** requires an aircraft flight manual in the aircraft. As there are no pilots or passengers, and given the size of the UAS's, this Regulation is inapplicable. An equivalent level of safety will be achieved by maintaining a manual. The FAA has previously issued exemptions to this regulation in Exemption Nos. 8607, 8737, 8738, 9299, 9299A, 9565, 9565B, 10167, 10167A, 10602, 10700 and 32827. **14 C.F.R. § 91.121** requires altimeter settings in the aircraft. Since there are no such settings possible and the UAS provides real-time GPS and barometric telemetry to the PIC, this regulation is inapplicable. **14 C.F.R. § 91.203 (a) and (b)** provides for the carrying of civil aircraft certifications and registrations. This regulation is inapplicable as to the small size of the UAS, however, the petitioner will maintain any required certifications and registrations. **14 C.F.R. § 45.23: Marking of The Aircraft**. Due to the small size of the UAS, two inch lettering is inapplicable. However, an N-number as large as possible, registered with the FAA will be put on the fuselage. **14 C.F.R. § 61.113: Private Pilot Privileges and Limitations: PIC.** The risks attendant to the operation of my UAS are far less than the risk levels inherent in the commercial activities outlined in 14 C.F.R. § 61, et seq. Thus, allowing the petitioner, a licensed Private Pilot with a current Third Class Medical Certificate to operate my UAS commercially meeting and exceeding current safety levels. **14 C.F.R. 91.105: Flight Crew Members at Stations.** The PIC of the UAS and the VO will remain at their respective stations during takeoff and landing as well as the duration of the flight. **14 C.F.R. 91.119: Minimum Safe Altitudes.** My UAS will not operate at an altitude greater than 400 feet AGL unless other altitude limits are forthcoming by the FAA. The petitioner will operate the UAS in a manner protecting the public and any

consenting participants, providing a level of safety at least equivalent to or below those in relation to minimum safe altitudes. **14 C.F.R. 91.405 (a); 407 (a) (1); 409 (a)(1)&(2); 417(a) & (b): Maintenance Inspections.** These Regulations only apply to aircraft with an airworthiness certificate. They will not, therefore, apply to the petitioner's UAS. However, as a safety precaution I inspect my UAS regularly as well as before and after each flight and have a maintenance program that involves regular software updates and curative measures for any damaged hardware. Therefore, an equivalent level of safety will be achieved.

In summary, the petitioner seeks an exemption from the following Regulations: 14 C.F.R. 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. § 91.9 (b)(2); 14 C.F.R. § 91.103(b); 14 C.F.R. § 91.105; 14 C.F.R. § 91.109; 14 C.F.R. § 91.119; 14 C.F.R. § 91.121; 14 C.F.R. § 91.151(a); 14 C.F.R. §§ 91.203(a) and (b); 14 C.F.R. § 91.405 (a); 14 C.F.R. § 91.407 (a)(1); 14 C.F.R. § 91.409 (a)(1)&(2); 14 C.F.R. § 91.409 (a) (2); and, 14 C.F.R. §§ 91.417 (a) & (b) to commercially operate the petitioners small unmanned vehicle/lightweight unmanned aircraft vehicle for aerial videography/cinematography to enhance academic community awareness, augment real estate listing videos, document accident scene locations, mapping, crop surveying, inspections and other flight operations. Currently, aerial related activities in the above areas rely primarily on the use of larger aircraft running on combustible fuel, posing potential risk to the public and/or being economically and logistically unfeasible. Granting the petitioners request for exemption will reduce current risk levels, stimulate economic development and enhance safety. My Phantom Vision 2 Plus UAS weighs less than 3 pounds, does not contain potentially explosive fuel and is smaller, lighter and more maneuverable than a conventional aircraft. It also only flies within visual line of sight of the PIC and an observer in a localized area requiring much less flight time than a conventional aircraft. Further, I operate at lower altitudes and in localized airspace eliminating potential public risk to people and property by having to fly to and from established airfields. The petitioner, as an Aeronautical Engineer, Private Pilot and experienced videographer has been informally analyzing flight information and has compiled safety protocols and the implementation of a flight operations manual as submitted with this document for his commercial UAS usage that exceeds currently accepted means and methods for safe flight. Formal collection of information able to be shared with the FAA can enhance the FAA's internal efforts to establish protocols for complying with the FAA Modernization and Reform Act of 2012. There are no personnel on board the petitioners UAS and therefore the likelihood of death or serious bodily injury is significantly diminished. The petitioners operation of my UAS, weighing less than 3 pounds and traveling at lower speeds within limited areas will provide an equivalent level of safety as that achieved under current FARs. Accordingly the petitioner respectfully requests that the FAA grant my exemption request providing me opportunity to cooperate in sharing information to benefit the FAA, safety of manned aircraft, and the general public at large. Similar exemptions to Astraeus Aerial (No. 11062) and Douglas Trudeau (No. 11138) as well as others have been recently granted that cover the same relief from regulations as requested in this petition for exemption.

Respectfully submitted,