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

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

August 19, 2015

Exemption No. 12524
Regulatory Docket No. FAA−2015−1026

Mr. Randy Hemmel
80 Fawnridge Drive
Long Valley, NJ 07853

Dear Mr. Hemmel:

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 letters dated April 10, 2015, June 1, 2015, and July 13, 2015, you petitioned the Federal Aviation Administration (FAA) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography and videography.

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

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

Airworthiness Certification

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

The petitioner requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*. In accordance with the statutory criteria provided in Section 333 of Public Law 112−95 in reference to 49 U.S.C. § 44704, and in consideration of the size, weight, speed, and limited operating area associated with the aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that the requested relief from

14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*, and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

You have requested to use a UAS for aerial data collection[1]. The FAA has issued grants of exemption in circumstances similar in all material respects to those presented in your petition. In Grants of Exemption Nos. 11062 to Astraeus Aerial (*see* Docket No. FAA−2014−0352), 11109 to Clayco, Inc. (*see* Docket No. FAA−2014−0507), 11112 to VDOS Global, LLC (*see* Docket No. FAA−2014−0382), and 11213 to Aeryon Labs, Inc. (*see* Docket No. FAA−2014−0642), the FAA found that the enhanced safety achieved using an unmanned aircraft (UA) with the specifications described by the petitioner and carrying no passengers or crew, rather than a manned aircraft of significantly greater proportions, carrying crew in addition to flammable fuel, gives the FAA good cause to find that the UAS operation enabled by this exemption is in the public interest.

Having reviewed your reasons for requesting an exemption, I find that—

- They are similar in all material respects to relief previously requested in Grant of Exemption Nos. 11062, 11109, 11112, and 11213;
- The reasons stated by the FAA for granting Exemption Nos. 11062, 11109, 11112, and 11213 also apply to the situation you present; and
- A grant of exemption is in the public interest.

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, Mr. Randy Hemmel 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. Randy Hemmel is hereafter referred to as the operator.

[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.

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

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

2. Operations for the purpose of closed-set motion picture and television filming are not permitted.

3. The UA may not be operated at a speed exceeding 87 knots (100 miles per hour). The exemption holder may use either groundspeed or calibrated airspeed to determine compliance with the 87 knot speed restriction. In no case will the UA be operated at airspeeds greater than the maximum UA operating airspeed recommended by the aircraft manufacturer.

4. The UA must be operated at an altitude of no more than 400 feet above ground level (AGL). Altitude must be reported in feet AGL.

5. The UA must be operated within visual line of sight (VLOS) of the PIC at all times. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses, as specified on the PIC's FAA-issued airman medical certificate or U.S. driver's license.

6. All operations must utilize a visual observer (VO). The UA must be operated within the visual line of sight (VLOS) of the PIC and VO at all times. The VO may be used to satisfy the VLOS requirement as long as the PIC always maintains VLOS capability. The VO and PIC must be able to communicate verbally at all times; electronic messaging or texting is not permitted during flight operations. The PIC must be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC must ensure that the VO can perform the duties required of the VO.

7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operating documents, the conditions and limitations herein take precedence and must be followed. Otherwise, the operator must follow the procedures as outlined in its operating documents. The operator may update or revise its operating documents. It is the operator's responsibility to track such revisions and present updated and revised documents to the Administrator or any law enforcement official upon request. The

operator must also present updated and revised documents if it petitions for extension or amendment to this grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted this exemption, then the operator must petition for an amendment to its grant of exemption. The FAA's UAS Integration Office (AFS−80) may be contacted if questions arise regarding updates or revisions to the operating documents.

8. Any UAS that has undergone maintenance or alterations that affect the UAS operation or flight characteristics, e.g., replacement of a flight critical component, must undergo a functional test flight prior to conducting further operations under this exemption. Functional test flights may only be conducted by a PIC with a VO and must remain at least 500 feet from other people. The functional test flight must be conducted in such a manner so as to not pose an undue hazard to persons and property.

9. The operator is responsible for maintaining and inspecting the UAS to ensure that it is in a condition for safe operation.

10. Prior to each flight, the PIC must conduct a pre-flight inspection and determine the UAS is in a condition for safe flight. The pre-flight inspection must account for all potential discrepancies, e.g., inoperable components, items, or equipment. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight.

11. The operator must follow the UAS manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components.

12. Each UAS operated under this exemption must comply with all manufacturer safety bulletins.

13. Under this grant of exemption, a PIC must hold either an airline transport, commercial, private, recreational, or sport pilot certificate. The PIC must also hold a current FAA airman medical certificate or a valid U.S. driver's license issued by a state, the District of Columbia, Puerto Rico, a territory, a possession, or the Federal government. The PIC must also meet the flight review requirements specified in 14 CFR § 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with 14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs

(training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However, training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.

15. UAS operations may not be conducted during night, as defined in 14 CFR § 1.1. All operations must be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) are not authorized.

16. The UA may not operate within 5 nautical miles of an airport reference point (ARP) as denoted in the current FAA Airport/Facility Directory (AFD) or for airports not denoted with an ARP, the center of the airport symbol as denoted on the current FAA-published aeronautical chart, unless a letter of agreement with that airport's management is obtained or otherwise permitted by a COA issued to the exemption holder. The letter of agreement with the airport management must be made available to the Administrator or any law enforcement official upon request.

17. The UA may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.

18. If the UAS loses communications or loses its GPS signal, the UA must return to a pre-determined location within the private or controlled-access property.

19. The PIC must abort the flight in the event of unpredicted obstacles or emergencies.

20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the intended operation and to operate after that for at least five minutes or with the reserve power recommended by the manufacturer if greater.

21. Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA). All operations shall be conducted in accordance with an ATO-issued COA. The exemption holder may apply for a new or amended COA if it intends to conduct operations that cannot be conducted under the terms of the attached COA.

22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification (N−Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.

23. Documents used by the operator to ensure the safe operation and flight of the UAS and any documents required under 14 CFR §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.

24. The UA must remain clear and give way to all manned aviation operations and activities at all times.

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

26. All Flight operations must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures unless:
    a. Barriers or structures are present that sufficiently protect nonparticipating persons from the UA and/or debris in the event of an accident. The operator must ensure that nonparticipating persons remain under such protection. If a situation arises where nonparticipating persons leave such protection and are within 500 feet of the UA, flight operations must cease immediately in a manner ensuring the safety of nonparticipating persons; and
    b. The owner/controller of any vessels, vehicles or structures has granted permission for operating closer to those objects and the PIC has made a safety assessment of the risk of operating closer to those objects and determined that it does not present an undue hazard.

    The PIC, VO, operator trainees or essential persons are not considered nonparticipating persons under this exemption.

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

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

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

29. The operator must have a motion picture and television operations manual (MPTOM) as documented in this grant of exemption.

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

31. Flight operations may be conducted closer than 500 feet from participating persons consenting to be involved and necessary for the filming production, as specified in the exemption holder's MPTOM.

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

This exemption terminates on August 31, 2017, unless sooner superseded or rescinded.

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

Enclosures

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Randy A. Hemmel - Exemption/Rulemaking

This Other document was issued by the **Federal Aviation Administration** (FAA)

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Content

Request for Section 333 Exemption - Real Estate Photography
April 10, 2015
by/for
Randy A. Hemmel

This document constitutes an exemption request under Section 333 of the FAA Modernization and Reform Act of 2012 for Aviation Unmanned to perform Real Estate Aerial Photography and Videography by/for Randy A. Hemmel.

The main use of this UAS would be taking Real Estate photos and videos. The UAS system that I plan to use is the DJI Phantom Vision 2 plus and will be referenced both in this document and the DJI Phantom user manual, which you can find here:

https://www.dropbox.com/s/9tmnse0s2qql304/Phantom_2_Vision_Plus_User_Manual_v1.8_en.pdf?dl=0

The safe operation to the NAS and/or persons and/or property will be insured by always flying the UAS within line-of-sight; visual contact to be maintained at all times. The UAS will never be flown over 400 feet AGL, and will never be flown directly over persons.

Flight orientation will be such that the pilot in command [PIC] will always have a visual on the flight indicator LED mounted on the rear of the UAS. The DJI Phantom is also equipped with the following safety features: Return to home switch, low voltage auto return to home, transmitter lost signal - auto return to home.

Pre-flight inspection of the UAS will always include - checking all batteries for condition in both the UAS craft, and the transmitter. Additionally, wi-fi repeater battery and cell-phone battery charge/condition will also be checked prior to any flight. An additional safety feature of the Phantom is the binding/link feature, which will prevent the UAS from starting if communication is broken.

ID: FAA-2015-1026-0001

Document Information

Date Posted:
Apr 15, 2015

Show More Details

Submitter Information

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Randy Hemmel

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Long Valley

Country:
United States

State or Province:
NJ

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07853

Comments

0
Comments Received *

Docket Information

This document is contained in
FAA-2015-1026

Related Dockets:
None

Related RINs:

Flight area conditions will always be checked - clear of obstacles/trees, no persons nearby or in the flight path, no power lines or other obstacles overhead, and wind gusts less than 12 mph. Wind speeds and gusts greatly affect the small UAS, and are always factored in for safe flying.

The serial number of the UAS is PH645241133 v2.0, and it has a Maximum Take-off weight of 1242g, max ascent/descent of 6 m/s, and a max forward speed of 15 m/s, or approx. 30mph. Battery life is approximately 20 minutes, and the craft is equipped with audible warnings for low battery indications.

The PIC will only be Randy Hemmel [myself], and I have a total of 92 hours flying the UAS. In addition, I have been a Private Pilot since 1985, and hold both power and glider ratings. In 30+ years as a pilot, I have always put safety first, and have a 100% safety rating with no incidents whatsoever. I am still an active glider pilot at this writing.

Maintaining the UAS and updating its software/firmware will be done on a regular basis. The UAS will inspected visually before each flight to insure all hardware is in place, that props are securely tightened, and that no nicks or cracks exist in props as well.

Im in excellent medical health, and sound mental health. I have no liens or judgements against me, and no arrests or felonies. The intended use of the DJI Phantom is to build my Real Estate Photography business.

As a former Coldwell Banker Real Estate agent, I have many contacts in the business, and they have expressed high interest in aerial photos for their listings. Other photographers in the region provide aerial photos - some using UAS devices as well - and they have a huge advantage over me.

Future flights for hire would be documented as far as time, date, location, etc. in order to track them. Additionally, I will keep a logbook for all flights - whether for hire or as training/testing flights.

The petitioner (Randy A. Hemmel) will file for a Certificate of Waiver or Authorization (COA). If a COA is not granted, I would ask that this request for exemption still be granted with a conditional use. This UAS will never be flown in the path of any aircraft, and will never be flown at night. Additionally, the first condition listed is to always keep visual contact with the craft, utilizing its bright LED display lights for reference.

My main objective is to offer low-level Real Estate photography to agents who are currently unable to obtain these, and to do so at competitive prices, and in the upmost safest way possible to the general public.

The approval of this exemption would greatly assist the general public in that this type of photography/videography would be a

None

Related Documents:
None

* This count refers to the total comment/submissions received on this *document*, as of 11:59 PM yesterday. Note: Agencies review all submissions, however some agencies may choose to redact, or withhold, certain submissions (or portions thereof) such as those containing private or proprietary information, inappropriate language, or duplicate/near duplicate examples of a mass-mail campaign. This can result in discrepancies between this count and those displayed when conducting searches on the Public Submission document type. For specific information about an agency's public submission policy, refer to its website or the Federal Register document.

boost to the economy in that it would enhance the marketability of Real Estate in this area.

Finally, granting of this exemption would not in any way adversely affect public safety as all operations would follow the safety guidelines I have outlined. At no time would any person or vehicle ever be at any higher risk than in todays environment.

Please take into consideration my 100's of hours of powered aircraft plus 75+ glider flights - all without incident. Safety is my highest factor in these UAS flights. Thank you.

Regards,
Randy A. Hemmel
80 Fawnridge Dr.
Long Valley, NJ 07853
908-303-9393
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Addendum to Petition for Exemption, requesting relief from the FAA Modernization and Reform Act of 2012, Public Law 112-95 FEB. 14, 2012, Section 333.

June 1st, 2015

ATT: Ms. Brenda Robeson, Program Analyst, Airmen and Airspace Rules Division

I am in receipt on your letter dated May 27th, 2015. Please find my response to your request for additional information:

The specific section or sections of 14 CFR from which Randy A. Hemmel seeks relief, the extent of the relief sought, and the reason Randy A. Hemmel seeks relief.

I am petitioning for an exemption seeking relief from the requirements of Title 14 of the Code of Federal Regulations sections as follows:

Part 21; Subpart H:
14 CFR Part 21 45.23 (b);
14 CFR Part 61.113 (a) & (b);
14 CFR Part 21 91.7 (a) (b) Subpart H. 14 CFR Part 21 91.9 (b)(2)
14 CFR Part 21 91.103 (b)
14 CFR Part 21 91.109
14 CFR Part 21 91.119
14 CFR part 21 91.121
14 CFR Part 21 91.151 (a)
14 CFR Part 21 91.203 (a)(b)
14 CFR part 21 91.405 (a)
14 CFR 407 (a) (1);
14 CFR 409 (a) (1) &(2)
14 CFR 417 (a) & (b).

The extent of relief Randy A. Hemmel seeks and the reason he seeks such relief:

Randy A. Hemmel 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 Randy A. Hemmel from engaging in

commercial photographic, videographic, and/or other flight operations within the NAS [national airspace system.]

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 DJI Phantom Vision 2+ UAS meets the definition of "small unmanned aircraft" as defined in Section 331 and therefore the integration of my ultra light weight UAS is expressly contemplated by the Reform Act. I would like to operate my ultra light weight UAS prior to the time period by which the Reform Act requires the FAA to finalize rules governing such craft. Thereby, providing direct experience and valuable information for formal regulation that can be administered uniformly to all related UAS aerial photography and videography.

The Reform Act provides guidance in determining the types of UAS's that may operate safely in our national airspace system. Considerations include 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. My UAS utilizes four propellers for balance, control and stability. My UAS is equipped with GPS and auto return safety technology. Weighing less than five (5) pounds (far below the maximum 55 pound limit); including integrated camera with gimbal.

As safety is foremost with each flight, my UAS is designed to hover in place via GPS and operate in less than a 15 mph wind with less than 1/2 meter deviation. For safety & stability of the craft, and general rule of safety, I will limit my flying to not exceed winds of more than 10 mph. Auto safety systems include GPS mode that allows my UAS to hover in place when radio controls are released. When transmitter communication is lost, the UAS is designed to return to the point of takeoff, and slowly descend and land itself automatically.

I do not operate my UAS near Airports, nor do I operate near areas where general public is within 100 yards. My locations will generally be private residences, and I will advise any homeowners to remain indoors as I photograph their home. I am also very cognizant of any manned aircraft in the area, and prepared to land immediately should one approach my area.

My UAS is capable of vertical and horizontal operations, and are flown only within my line of sight. Battery powered flights generally last between 10-15 minutes, with an altitude generally under two hundred (200) feet. I, Randy A. Hemmel, utilize a fresh fully charged battery with each flight as a safety precaution; full flight time limit for each battery is 20 to 25 minutes as tested with the Phantom Vision 2+ version 3.0 batteries. These are the newer and more efficient Version 3.0 batteries and are rated to last up to 25 minutes of flight time.

The Phantom Vision 2+ is not operated at or below manufacture recommend minimum charge levels for operation; I remain well within a safe operating range to insure adequate communication between radio control and UAS to eliminate potential for loss of control or any other hazard.

Reserve batteries are at hand at all times with every photo session to insure replacement for sufficient safe level of operation. I do not take any risks that may cause a crash, or could create hazard to the public/property/ manned aircraft. The dollar value of the craft's investment surely precludes any desire to do so. As a hobbyist, I have clocked numerous practice flights in the local park over empty fields and other remote areas. These flights have served to enable the petitioner, Randy A. Hemmel, to gain familiarization with the characteristics of this specific UAS's performance under various conditions. All of the above is in the name of safety.

I, Randy A. Hemmel, am extremely cautious when operating of 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 UAS it falls well within Congress's contemplated safety zone when it promulgated the Reform Act and the corresponding directive to integrate UAS's into the national airspace system. Randy A. Hemmel UAS, used in flight, has a demonstrable safety record and does not pose any threat to the general public or national security.

The reasons why granting the request would be in the public interest; that is, how it would benefit the public as a whole.

Aerial Photography & Videography for Real Estate marketing provides Realtors and their Real Estate Agencies with very dynamic, dramatic, and otherwise unseen vistas of developments, neighborhoods, and individual homesites that have previously been unobtainable even with aerial photos from aircraft or helicopters.

Aerial photography via UAS provides views of houses, buildings and landscapes that cannot be seen from the ground. This type of photography can be especially helpful for larger properties. Real estate companies would surely present some property in a better way if that large property can be viewed from the air and by showing the roads and other features around that property. There is no better way to do that other than using aerial photography, and UAS photos offer the best perspective possible.

The public benefits by being able to see and assimilate much more information on a specific listing than ever before possible. The low-level nature, hovering ability, and high-resolution photographs & video possible with the UAS did not even exist a short time ago. Aerial videos of homes can reveal much more about a neighborhood than views currently available today via Bing, Google Earth, or Zillow. Real Estate photos produced by the UAS can relay all of this detailed information with absolutely no additional cost to the consumer.

There currently exists no other medium which can portray a homesite in more dynamic and dramatic detail as a UAS-produced photo or video. And there is a huge, pent-up demand in the public for these photos/videos.

<u>Why Drone Photography is a Safer Alternative</u>

From the FAA's own study, "The agency writes that using drones to shoot aerial photos can be both cheaper and safer than using a heavier aircraft. They would pose less risk to the public in the event of an accident and "would also generate significant cost savings to the economy."

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 this exemption request furthers the public interest and educational awareness through aerial photos and videos of the topographical structures in and around Real

Estate listed for sale in my area of NJ. It provides Realtors with a safe and reasonably lower-priced option to acquire Aerial photos and videos. With this option available to them, Realtors will not be tempted to purchase UASs themselves, and attempt to learn how to operate them - ignoring the FAAs regulations, and putting themselves - and anyone nearby - in harm's way. A much safer alternative is to grant my exemption, and allow me to pursue this avenue with many hours of UAS time already logged, and with full knowledge, awareness, and adherence to FAA rules and regulations - the same as I have done as a 30+ year licensed and currently active pilot.

Yet another advantage and benefit to the public is that my UAS is light weight, battery powered, and produces no emissions that can harm the environment. And if the Phantom were to crash for any reason, the result would be far less of an impact if a full size aircraft or helicopter were to go down. The much heavier aircraft with fuel and crew on board if crashed would more likely result in injury and fatalities to the public and the flight crew as well. These fears are much abated with the employ of a small, light weight UAS doing essentially the same Aerial Photo tasks as the larger, full-sized aircraft, and with higher-resolution and closer photos than possible in an airplane in a much safer fashion. Fires and fuel spills can be catastrophic in aircraft crashes; a UAS crash presents no such risks to the public. Further, as the public is kept out of harm's way during my photo shoots of homes, there is little or no danger at all to the public with the approval of this exemption.

Permitting me, Randy A. Hemmel, to immediately fly within national air space furthers economic growth. Granting this exemption request substantially furthers the economic impact for Realtors and their agencies looking to create Real Estate listings in the area which utilize this highly attractive media, which also serves as a stimulus to the community at large, and provides a relatively low-cost option for Realtors to include aerial photos in their listings.

Additionally, the National Association of Realtors has now updated their policy on drone photos/videos to state:

"NAR does not recommend members use UAVs to take pictures or video of a property for a listing, or hire a third party to take pictures or video until the FAA has clear regulations for the use of UAVs or the user has received a waiver from the FAA."

The issuance of this waiver will satisfy the above requirement from the NAR, and will encourage Realtors to use my services in a legal fashion, thus stimulating economic growth via increased interest and discussion of such aerial photos/videos.

Reasons why this exemption will not adversely affect safety or how the exemption will provide a level of safety at least equal to that provided by the rule from which Randy A. Hemmel seeks an exemption.

This exemption will not adversely affect safety; it will **enhance** safety protocols. The exemption will allow Randy A. Hemmel to log more flight time with the UAS in FAA controlled airspace, with communications with the FAA. It will allow Randy Hemmel to contribute to the growing knowledge base of UAS operations in the US with the innovation of new and as yet-to-be discovered safety protocols which can and will be developed in cooperation with the FAA.

Additionally, Randy A. Hemmel, the petitioner, submits the following enhancements to current aerial photography and videography:

My UAS weight is 2.68lbs. including payload.

The UAS is only operated below 400 feet - within the 400 foot permissible ceiling set by the FAA Modernization and Reform Act of 2012, and it's internal software is automatically limited to the 400 foot height.

By virtue of the software setting, it cannot fly higher than 400 feet, even if the operator attempts to do so.

The Phantom Vision 2+ operates for approx. 15 minutes per flight, with up to 10 minutes of battery reserve power.

I land the UAS prior to manufacturer recommended minimum level of battery power. I have never run out of power while flying the Phantom Vision 2+, thus avoiding any emergency landings.

Critical battery warnings include a very loud audible signal, as well as a bright red display on the attached iPhone display screen which is impossible to ignore.

My UAS is remotely controlled and piloted only by line of sight. In typical Real Estate shooting, the UAS is never more than 100 feet from the operator, and never out of sight.

I never use "FPV" goggle or any other vision aided technology to see the UAS.

The GPS flight safety feature will automatically hover the craft and then slowly land it if communication is lost with the remote controller. I test this function on a regular basis to insure all fail-safe systems are working. The system works as designed in my craft, as tested by Randy A. Hemmel.

I continually keep myself updated on all UAS activities and FAA regulations by actively reviewing multiple UAS/UAV/FAA/DJI websites, portals, and forums. These enable me to keep on top of all rules and regulations, and also to enhance my own safety protocols.

I limit my UAS operations to safe environments, away from people, obstructions, power lines, & airports.

As safe flights are the most important, I do pre- and post- flight inspections of the UAS.

Also in line with safe flying, all necessary permissions are obtained prior to operation.

Procedures and protocols are in place to abort flights in the event of safety breaches.

I will operate as PIC [pilot in command] and have a Private Pilot's License including both power and glider ratings. I have been flying aircraft since 1985, and my experience has enabled me to fly the UAS with excellent precision and valuable knowledge-based decisions.

I will be the ONLY PIC operating the UAS, thus adding to the safety factor.

I will operate only in flight conditions that meet the manufacturer's recommended parameters.

I currently have and will continue to purchase up-to-date Sectional charts such that I insure that I am flying within the established limitations granted to me by the FAA. As a 30-year licensed pilot, I am well-aware of how to read a Sectional Chart.

All flights will be over non-congested areas.

I do not operate the UAS at max. forward speed; only at the speed necessary and prudent for the photography required.

As there are no people on board and the UAS is operated only in specific areas, therefore the potential loss of life is greatly diminished.

As there is no fuel on board a UAS and thus the potential for fire or explosions is eliminated.

The small size and high maneuverability of the Phantom Vision 2+ allows me to easily and remotely fly away from and avoid hazards quickly and safely.

My UAS has been experimentally operated for familiarization/competency and will continue to operate at and above current safety levels.

My safety protocols provide a level of safety equal to or exceeding existing rules.

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 enclosed operational area of Randy A. Hemmel's, UAS permits exemption from Part 21 because my UAS meets (and exceeds) an equivalent level of safety pursuant to Section 333 of the Reform Act.

The FAA is authorized to exempt 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. Mr. Randy A. Hemmel's current and projected UAS's meet or exceed 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 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 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 utilizes electronic global positioning systems with a barometric sensor.

4 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 me, Randy A. Hemmel.

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 are, by definition, unmanned. They therefore do 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 its UASs in the largest possible lettering by placing the word “EXPERIMENTAL” on its fuselage as required by 14 C.F.R. §45.29 (f) 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.

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. I, Randy A. Hemmel, can achieve an equivalent level of safety as achieved by current Regulations because my UAS does not carry any pilots or passengers. The risks attended to the operation of my UAS is far less than the risk levels inherent in the commercial

activities outlined in 14 C.F.R. § 61, et seq. Thus, allowing me, Randy A. Hemmel, to operate my UAS meet and exceed current safety levels in relation to 14 C.F.R. §61.113 (a) & (b).

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 AGL; I, Randy A. Hemmel, will operate my UAS in safe areas away from public and traffic, 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.

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

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 my, Randy A. Hemmel's, UAS. However, as a safety precaution I inspect my UAS before and after each flight and have had it serviced and upgraded by the manufacturer.
A Summary The FAA May Publish in the Federal Register: 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 my UAS permits exemption from Part 21 because my, Randy A. Hemmel, 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, 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, Randy A. Hemmel 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. § 91.109; 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)(2); 14 C.F.R. § 91.409 (a) (2); and, 14 C.F.R. §§ 91.417 (a) & (b)

To commercially operate my, Randy A. Hemmel's, small unmanned vehicle/lightweight unmanned aircraft for photographic operations in support of the local real estate market. I operate at low altitudes and in controlled airspace eliminating potential public risk. These operations will allow the business community an alternative to using full size helicopters or aircraft thereby providing a more economical, safer, and less intrusive method to acquiring there promotional sales materials.

I, Randy A. Hemmel, have been analyzing flight information and will compile safety protocols and the implementation of a flight operations manual for Aerial Photography usage that exceeds currently accepted means and methods for safe flight. Formal collection of information shared with the FAA will 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 my, Randy A. Hemmel's, UAS and therefore the likelihood of death or serious bodily injury is significantly reduced. My, Randy A. Hemmel's operation of my UAS, weighing less than 5 pounds and traveling at lower speeds within limited areas will

provide an equivalent level of safety as that achieved under current FARs. Accordingly Randy A. Hemmel respectfully requests that the FAA grant this exemption request and Randy A. Hemmel is willing to cooperate in sharing information to benefit the FAA, the safety of manned aircraft, and the general public at large.

Respectfully submitted,

Randy A. Hemmel

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July 13, 2015

Dear Exemption Manager, Mr. John S. Duncan;

As per http://www.faa.gov/news/updates/?newsId=82485 I am requesting that this exemption request be considered and granted under the new "Summary Grant" process announce by the FAA in the above on April 9, 2015.

The following is in support of my Petition #FAA-2015-1026 for an Exemption for Unmanned Aircraft Systems operations.

I, Randy Hemmel, am an FAA licensed private pilot with over 425 flight hours including 75 glider flights as PIC. Mr. Hemmel has been a private pilot since 1985, flying many different types of aircraft, and takes the skills and education for the safe operation of UAS, very seriously. Mr. Hemmel has both private pilot power & glider ratings and has flown aircraft for over 30 years without a single incident.

Randy Hemmel's request is for a waiver of the sections previously identified in this exemption request in an effort to operate a **DJI Phantom** UAS **only for Real Estate photos/videos.**

The FAA has indicated that the length of time for these exemption requests to be processed will be based in part on the *completeness & the complexity* of the requests.

Completeness - This request is complete and is similar to other exemptions granted recently. As per email from the FAA on June 15th, 2015:

"We received your submission of the requested information on June 5, 2015; at which point, **your petition was determined to be complete,** and **ready for review** under Section 333. Your petition is *under review at this time."*

Complexity - This is a simple exemption request for aerial photography and videography for Real Estate utilizing a Phantom Vision 2+ UAS. Many similar requests have been granted recently by the FAA including exemptions **11969, 11971, 11945, 11954, & 11959**. These requests are all for Real Estate photography using the DJI Phantom Vision 2 UAS.

They are exactly the same as my petition.

In reference to the FAA announcement: http://www.faa.gov/news/updates/?newsId=82485

This announcement references the FAA's experience in reviewing Section 333 petitions. These generally fall into two categories; film/television production and aerial data collection and that most of the exemption requests in these categories will likely be handled through the new **summary grant process.**

With a solid understanding of FAA rules, the awareness of National airspace, plus 30+ years experience as a private pilot, and a *100% safety record* over three decades, Randy Hemmel believes he should be granted an exemption.

Mr. Hemmel's request for a waiver of the section is not for operations for the purpose of "closed-set motion picture and television filming", but rather **only for aerial photography and videography for Real Estate purposes.**

The petitioner is seeking an exemption to operate an unmanned aircraft system (UAS) under the new FAA "Summary Grant" approach, announced April 9, 2015 here:

http://www.faa.gov/news/updates/?newsId=82485 This will help speed up Section 333 exemption approvals for many commercial UAS operators prior to finalizing the small UAS proposed rules.

It is Mr. Hemmel's understanding that the FAA will still individually review each Section 333 petition. However, it is hoped that the agency will accept this particular petition, and include it in the next summary grant, and issue to Mr. Hemmel an exemption on the presumption that the FAA has "already granted a previous exemption similar to this request".

Based on the size of the craft, experience of the pilot, and operational goals, this request appears to be well suited for approval using the new **summary grant procedure** and the current criteria outlined in Section 333 of the FAA Modernization and Reform Act of 2012.

Sincerely,

Randy Hemmel