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

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

September 2, 2015

Exemption No. 12713
Regulatory Docket No. FAA−2015−1094

Mr. Devyn Daniels
Chairman
Skyeography LLC
2520 65th Avenue
Sacramento, CA 95822

Dear Mr. Daniels:

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

By letter dated April 13, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Skyeography LLC (hereinafter petitioner or operator) 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 Parrot Bebop.

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

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

Conditions and Limitations

In this grant of exemption, Skyeography LLC is hereafter referred to as the operator.

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

1. Operations authorized by this grant of exemption are limited to the Parrot Bebop 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 September 30, 2017, unless sooner superseded or rescinded.

Sincerely,

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

Enclosures

April 13, 2015

Skyeography LLC
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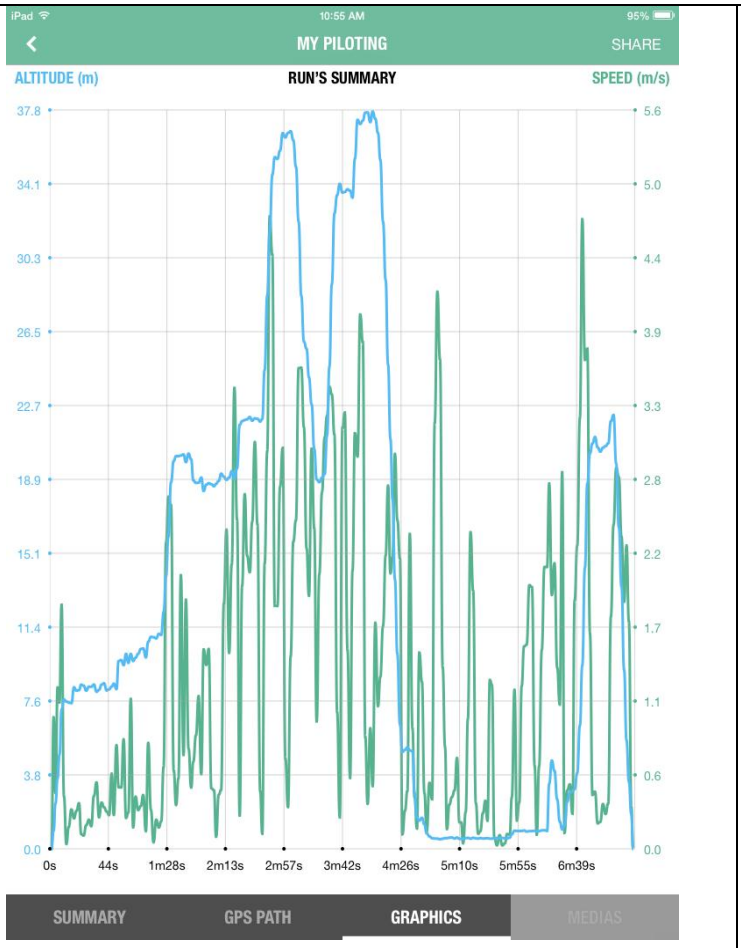
Sacramento, CA 95822
(916)821-7729
Skyeography@gmail.com

My name is Devyn Daniels, Chairman and pilot in command (PIC). I am one of three owners in Skyeography LLC (referred to as petitioner) and I am 1 requesting permission from the Federal Aviation Administration (FAA) to grant exemption from part 21 §§ 45.23(b),61.113(a) and (b),91.7(a),91.9(b)(2),91.103,91.109,91.119,91.121,91.151(a),91.203(a) and (b),91.405(a),91.407(a)(1),91.409(a)(2),and 91.417(a) and(b)of Title14, Code of Federal Regulations (14 CFR). The exemption would allow Skeyeography LLC to safely operate the Parrot Bebop with a Skycontroller unmanned aircraft system (UAS) to conduct commercial UAS operations for the purpose of aerial photography for Real Estate, photographs, video, special events and/or occasions in an controlled environment that will not interfere with the safety and/or well being of individuals. By operating the UAS within the parameters below; which does not jeopardize the safety of the public but in fact protect the safety of individuals through use of a lightweight compact UAS rather than a manned aerial vehicle which has the potential to jeopardize the PIC, the crew, damage the target or object(s) being filmed, or cause serious injury to the public or parties involved.

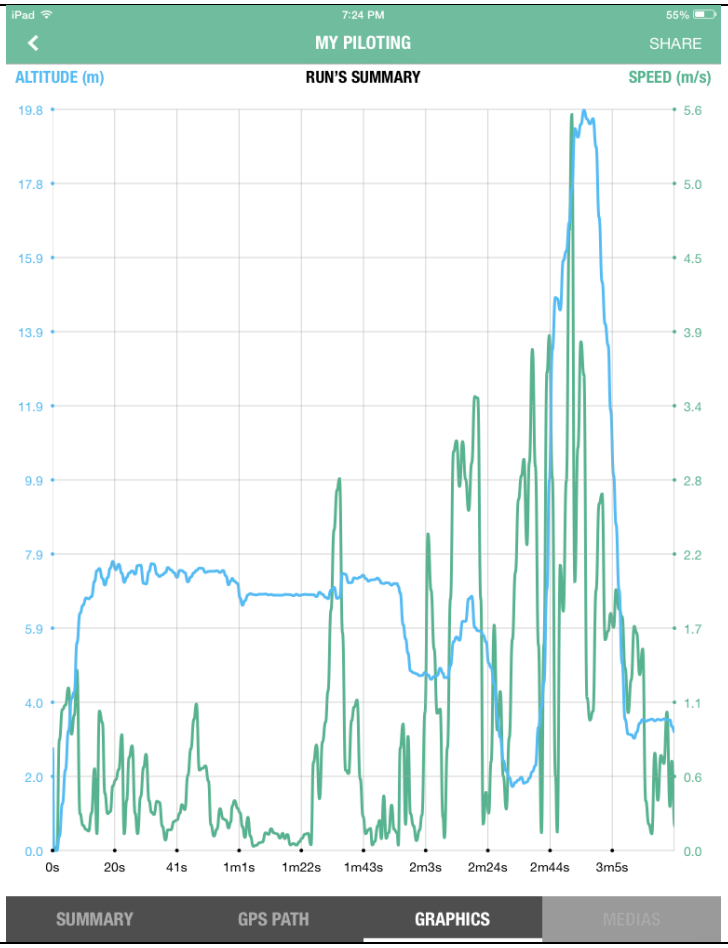
The Parrot Bebop is a lightweight quad copter also known as a UAS that was built with safety in mind. It has a weight of 400g with the dimensions of: 28 x 32 x 3.6cm/11 x 12.6 x 1.4in.

This UAS is very small, lightweight and compact with an emergency mode. In the event of an extraordinary circumstance where the propellers come into contact with an object the propellers will stop automatically to prevent any damage. The software used to run the UAS has country settings (that can't be changed) that will not allow the UAS to travel above 400ft altitude since that is the safe height FAA has allowed for any UAV. The UAS comes with a controller called the Skycontroller that extends the range (ranges up 1.4mi/2km in optimal condition) and reliability of the connection between the UAS and controller. In a unique occasion where there is a disconnection between the controller and the UAS, the UAS will automatically maintain its position without moving giving the operator one minute to reconnect to the UAS; if a reconnection is unsuccessful the UAS will automatically return to the location where the UAS last took off. The software used to control the UAS is called Free Flight which comes preinstalled onto the controller. With the Free Flight software you have full control of options for safe operation. This includes max vertical speed, max rotational speed, max altitude and max inclination. The max vertical setting allows for the vertical movement speed of the UAS. The max rotational speed allows for the movement speed of the yaw (movement along the Y-axis). Max altitude allows for the maximum height the UAS can fly; but, the software as stated previously will only allow for a maximum of 150m which cannot be changed. For the intended use listed above for Skyeography LLC, on average the UAS will be operated at the maximum altitude of 130ft and for rare occasions if the UAS needs to travel higher than the average it will not come close to exceeding 400ft. Max inclination is the speed setting which controls the degree at which the tip of the nose of the UAS will fly for a maximum speed of 13m/s or approx 30mph. For the intended commercial use of Skeyeography we have no consistent need to fly at that speed. Below is a chart/map (Appendix A) of speeds and a GPS data (Appendix B) of the flight path of the UAS. The first chart shows the UAS never reached altitudes higher than 40m or 130ft for no longer than a minute, and speeds no faster than 11mph which is a typical or average flight.

Appendix A:



Appendix B:



Free Flight gives the option to change the channel for maximum connectivity between the Skycontroller and the UAS for less interference. The Free Flight software used to control the UAS has a diagnostic tool to alert the operator about the current firmware on the UAS and Skycontroller; it also alerts the operator about motor functionality.

The Parrot Bebop (UAS) uses Wi-Fi 802.11a/b/g/n/ac for connectivity between the UAS and controller. The Wi-Fi antenna comes with MIMO dual-band channel 2.4 GHz and 5 GHz sending power up to 21dBM and signal range up 250 meters. The Parrot Bebop also contains various sensors to distinguish its position, height and stability which include:

- 3-axes magnetometer
- 3-axes gyroscope
- 3-axes accelerometer
- Optical-flow sensor; Vertical stabilization camera which every 16 milliseconds, an image of the ground is taken and compared to the previous one to determine the speed of the UAS.
- Ultrasound sensor that analyzes the flight altitude up to 8 meters
- Pressure sensor

When the drone is above eight meters the UAS uses GPS+GLONASS (GNSS) to determine its position. All of the components of this UAS meet FCC compliance and does not conflict with any other government agency.

Referenced (Appendix C) below is the Wi-Fi Regulation the UAS uses on each frequency which complies with all US regulation:

(Appendix C) - WiFi Regulation

		Indoor use			Outdoor use		
	Channels	2G4-band 6	5G-band1 36-40-44-48	5G-band3 149-153-157-161	2G4-band 6	5G-band1 36-40-44-48	5G-band3 149-153-157-161
	Frequency (Mhz)	2432	5150-5250	5725-5825	2432	5150-5250	5725-5825
	US	4W	1W	4W	4W	1W	4W
	Europe	100mW	200mW	Forbbiden	100mW	Forbbiden	Forbbiden
	China	100mW	200mW	2W	100mW	Forbbiden	2W
	Canada	4W	200mW	4W	4W	Forbbiden	4W
	Japan	100mW	200mW	Forbbiden	100mW	Forbbiden	Forbbiden
	HK	4W	200mW	4W	4W	Forbbiden	4W
	Singapore	200mW	100mW	1W License required	200mW	100mW	1W License required
	Korea	100mW	10mW	200mW	100mW	Forbbiden	200mW
	India	200mW	1W	1W	200mW	1W	1W
	Venezuela	200mW	4W	4W	200mW	4W	4W
	Taiwan	1W	Forbbiden	1W	1W	Forbbiden	1W
	Indonesia	100mW	Forbbiden	200mW	100mW	Forbbiden	2W
	Australia + NZ	4W	Forbbiden	200mW	4W	Forbbiden	200mW
	Russia	100mW	200mW	100mW	100mW	Forbbiden	100mW
	South Africa	100mW	Forbbiden	25mW	100mW	Forbbiden	25mW
	Argentina	100mW	Forbbiden	1W	100mW	Forbbiden	1W
	Mexico	100mW	4W	4W	100mW	4W	4W
	Brazil	100mW	200mW	1W	100mW	200mW	1W

The UAS does not require any special training or certification to pilot. The control layout of the UAS consists of two sticks. One stick controls the Yaw movement and altitude height. The other stick controls the lateral movement, forward and back movement. When both control sticks are idle the UAS hovers stably. The PIC will have vision comparable to a Class C California licensed driver. The petitioner who I will refer to as the PIC from this point forward has over 100 successful flights with the UAS and total hours exceeding 100 plus each day exceeding that because of daily flights that occur. The PIC is competent and confident in his ability to pilot any UAS with the given manual due to his long and

extensive background and experience of over 1000 hours piloting 3-channel helicopters. 3-channel helicopters have very similar controls to UAS; except with the 3-channel helicopter the PIC is in full control of the helicopter and there is no computer or technology to keep the aircraft stable which makes this UAS easier to pilot than a 3-channel helicopter. The PIC has a vast understanding of the FAA regulations currently in place, and frequently checks for updates and changes to regulations. The PIC is also a member of the AMA which is described in the next paragraph.

All PICs will be required to become a member of the Academy of Model Aeronautics (AMA), to insure operators stay up to date on all new and existing regulations and stay informed about the newest Aeronautics information. As a member of the AMA the PIC receives Member Insurance Benefits which includes a $2.5 Million Liability Umbrella, $25,000 in Medical Coverage, $1,000 Fire and Theft Coverage.

The intended operation is solely for the purpose of photography/videography of real property, special outdoor events or any need for our services as long as it's in a controlled or private property. The UAS would maintain a safe stabilized position in the air not above any human with the UAS having slight movements. Standard procedure for UAS during operation will be as follows: before the operation of the UAS it will be required to notify all affected parties regarding the operation of the UAS, the flight pattern and/or the position of the UAS flight. All affected parties will be aware of the UAS in use and the intended use of the UAS will be made clear to all parties present. All members will be informed to maintain a safe distance from the UAS while it is in use. If verbal contact is made by the Visual Observer (VO) to anyone who comes within a safe distance of the UAS it will be agreed that they comply with the VO commands. The VO will be responsible to relay any possible safety situations to the PIC or any civilian or human that comes within an unsafe distance of the UAS. Set define areas in the surrounding areas will be marked as unsafe zone. Any person(s) will be immediately notified by the PIC or VO if within an unsafe distance of the UAS.

The UAS will be only piloting for its minimal capabilities and well within the current regulations of the FAA which is flying no higher than 400ft, the UAS will remain in Visual Line of Sight (VLOS), will remain clear of any manned aircraft operations, not pilot within five miles of an airport without contacting the airport or control tower, Not fly under the influence of alcohol or drugs, will not fly over sensitive property or infrastructure such as power stations, water treatment facilities, government facilities, correctional facilities, heavily traveled roadways, not fly under adverse weather conditions such as reduced visibility or high winds, the PIC will be operating in a safe environment and the operator is competent and proficient in the operation of the UAS, and will not conduct surveillance or photograph persons in areas where there is an expectation of privacy without the individuals permissions. The UAS will majority of flight time maintains steady speeds of no faster than 5-8 meters/per sec (m/s) when filming outdoor social events or real property. The UAS as stated above can fly at maximum speed of 35mph, the only time UAS would travel this speed is in an open environment that is controlled and sealed off with limited human contact so that it could be possible to capture a rare aerial aspect that could not otherwise be captured. To capture similar images it would require a manned vehicle such as am helicopter which would require a crew. In addition, a UAS does not put out any emissions, which has no affect on the environment like a helicopter would to achieve the same capabilities of a UAS. In a rare collision with the UAS there will be no casualties and no serious injuries, as opposed to risking a crew for a aerial shot that can be much easier captured with a UAS, and the cost to operate a UAS as opposed to the alternatives is much lower and reasonable.

Operations Manual for Parrot Bebop (refer to manual page 8-9 that was uploaded with the exemption)

Preflight Check

*Before each flight session, check the following points:

- Do not fly the Parrot Bebop Drone at night.
- Check the weather conditions. Do not fly the Parrot Bebop Drone when the weather is rainy, snowy, or foggy.
- Ensure there is no obstacle in your flight area that could disturb piloting or visual flight.
- Ensure the use of the Parrot Bebop Drone is allowed in your flight area.
- Check the Wi-Fi use restrictions in your flight area. (Pg.4 of exemption)
- Ensure the propellers are correctly installed and locked. For further information, see Before you begin (Pg.4 Manual)> Changing the propellers(Pg.7 Manual)
- Ensure the battery is correctly attached to the Parrot Bebop Drone. For further Information, see Before you begin (Pg.4 Manual)> Installing the battery.
- Ensure the Parrot Bebop Drone and your Smartphone batteries are charged.
- Check the quality of the Wi-Fi range. For further information, see Settings > Wi-Fi.