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

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

May 5, 2015

Exemption No. 11464
Regulatory Docket No. FAA–2015–0235

Ms. Dannette J. Myers
Manager
Michael's Drone Photography, L.L.C.
1850 Golden Gate Avenue
Kingman, AZ 86401

Dear Ms. Myers:

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.

The Basis for Our Decision

By letter dated January 26, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Michael's Drone Photography, L.L.C. (hereinafter petitioner or operator) for an exemption. The exemption would allow the petitioner 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 1.

The petitioner requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*. In accordance with the statutory criteria provided in Section 333 of Public Law 112−95 in reference to 49 U.S.C. § 44704, and in consideration of the size, weight, speed, and limited operating area associated with the aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that the requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*, and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

You have requested to use a UAS for aerial data collection. 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, Michael's Drone Photography, L.L.C. 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, Michael's Drone Photography, L.L.C. 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 1 when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

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

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

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

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

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

7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operating documents,

the conditions and limitations herein take precedence and must be followed. Otherwise, the operator must follow the procedures as outlined in its operating documents. The operator may update or revise its operating documents. It is the operator's responsibility to track such revisions and present updated and revised documents to the Administrator or any law enforcement official upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to this grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted this exemption, then the operator must petition for an amendment to its grant of exemption. The FAA's UAS Integration Office (AFS−80) may be contacted if questions arise regarding updates or revisions to the operating documents.

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

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

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

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

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

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

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with 14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However, training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

28. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS−80) within 24 hours. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.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 April, 30, 2017, unless sooner superseded or rescinded.

Sincerely,

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

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January 26, 2015

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

Re: Exemption Request Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations from 14 C.F.R. 45.23(b);14 CFR Part 21;14 CFR 61.113 (a) & (b); 13 C.F.R. 61.133(a); 91.7 (a);91.9 (b) (2);91.103(b); 91.109;91.119; 91.121; 91.151(a);91.203(a) & (b);91.405 (a); 91.407(a) (1); 91.409 (a) (2);91.417 (a) & (b).

Dear Sir(s)/Madam(s):

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 ("**Reform Act**") and 14 C.F.R. Part 11, Michael's Drone Photography, L.L.C., an Arizona limited liability company, the operator of a DJI Phantom 1 ("**UA**"), seeks an exemption from the Federal Aviation Regulations ("**FARs**") as listed and discussed below.

Michael's Drone Photography's team has flown its UAs, for recreational purposes, for hundreds of hours without incident. Michael's Drone Photography's UAs are equipped to take aerial videography and photography to enhance awareness for those individuals and companies unfamiliar with the geographical layout of certain areas and augment real estate listings and promote the use of certain real estate properties which provides an enhancement to academic research being performed in certain geographical areas ("**purpose**").

Michael's Drone Photography's exemption request will permit the operation of comparatively inexpensive UAs in tightly controlled, predetermined and limited airspace. This airspace will include areas away from general public, airports, heliports and vehicular traffic for

community videos, and within property boundaries for real estate listing videos and photos. Currently, similar lightweight, remote controlled UAs are legally operated by unmonitored and untrained amateur hobbyists with no safety plan or controls in place to prevent catastrophic events. Michael's Drone Photography has safety protocols and controls in place to avoid and prevent public hazards as well as preventing the interference with manned aircraft which could cause a hazard or catastrophe. This acts to enhance safety protocols unique to Michael's Drone Photography's lightweight UAs being utilized specifically for real estate videography and photography. Michael's Drone Photography hope to be able to record flight data and other information gained through permitted flight operations which may be shared with the FAA through any required FAA reports to assist with the development of future FAA protocols and safety regulations.

The use of Michael's Drone Photography's UAs for these purposes reduces the need to operate conventional aircraft, typically needed to perform these types of operations, provides an economic benefit to the business consumer as the Michael's Drone Photography UAs provides higher quality imagery at a fraction of the cost of aerial videography and photography using conventional aircraft. These savings result in not only enhanced efficiency and productivity for the affected activities but added environmental and safety benefits to the public at large.

As described more fully below, Michael's Drone Photography's requested exemption would authorize commercial operations of aerial videography and photography, using Michael's Drone Photography's UAs, which will be operated under controlled conditions at an altitude of no greater than three hundred (300) feet AGL in airspace that is limited in scope and will have automated control features. Michael's Drone Photography's UAs will also be operated by an individual who has passed an FAA approved ground training exam, if required by the FAA. As outlined below, the airspace in which Michael's Drone Photography's UAs will operate within will be disclosed to the FAA in advance to flight operation. Finally, Michael's Drone Photography's UAs will be used in lieu of comparatively hazardous operations now conducted with fixed wing and rotary conventional aircraft which should reassure the FAA that these operations will achieve at least an equivalent level or greater level of safety.

In the interest of economic efficiency and public safety, Michael's Drone Photography hereby respectfully applies for an exemption from the listed FARs to allow commercial operations of Michael's Drone Photography's UAs, 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. Approval of this exemption would thereby enhance safety and fulfill the Secretary of Transportation's ("**Administrator**") responsibilities under Section 333(c) of the Reform Act to "establish requirements for the safe operation of such aircraft systems in the national airspace system."

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As discussed above and more fully described below, the requested exemption would permit the operation of small, unmanned and relatively inexpensive UAs under controlled conditions in airspace that is limited and predetermined. Approval of this exemption would thereby enhance safety and fulfill the Administrator responsibilities to "...establish requirements for the safe operation of such aircraft systems in the national airspace system." Please see Section 333(c) of the Reform Act.

Additionally, the FAA has already granted a previous exemption which is essentially identical to the exemption being sought by Michael's Drone Photography. Please see FAA Exemption No. 11138.

The name and address of the applicant is:

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REGULATIONS FROM WHICH THE EXEMPTION IS REQUESTED

14 C.F.R. Part 21
14 C.F.R. 45.23(b)
14 C.F.R. 61.113(a) & (b)
13 C.F.R. 61.133(a)
14 C.F.R. 91.7(a)
14 C.F.R. 91.9(b)(2)
14 C.F.R. 91.103
14 C.F.R. 91.109
14 C.F. R. 91.119
14 C.F.R. 91.121
14 C.F.R. 91.151(a)
14 C.F.R. 91.203(a) & (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. 91.417(a) & (b)

This exemption application is expressly submitted to fulfill Congress' goal in passing Section 333(a) through (c) of the Reform Act. This law directs the Secretary of Transportation to consider whether certain unmanned aircraft systems may operate safely in the national airspace system (NAS) before completion of the rulemaking required under Section 332 of the Reform Act. In making this determination, the Secretary is required to determine which types of UAs do not create a hazard to users of the NAS or the public or pose a threat to national security in light of the following:

- The UA's size, weight, speed, and operational capability;
- Operation of the UAs in close proximity to airports and populated areas; and
- Operation of the UAs within visual line of sight ("**VLOS**") of the operator.

Reform Act § 333 (a).

Lastly, if the Secretary determines that such vehicles "may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft in the national airspace system." Id. §333(c) (emphasis added).[1]

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

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

Michael's Drone Photography's UAs are rotorcraft weighing less than five (5) pounds (2.26796 Kg) including energy source(s), equipment and any payload. They operate, under normal conditions at a ground speed of no more than thirty (30) knots and have the capability to hover, and move in the vertical and horizontal plane simultaneously. The UAs will operate only in line of sight and within safe. Such operations will insure that the UA will "not create a hazard to users of the national airspace system or the public."[3]

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[1] Michael's Drone Photography interprets this provision to place the duty on the Administrator to not only process applications for exemptions under section 333, but for the Administrator to craft conditions for the safe operation of the UA, if it should be determined that the conditions set forth herein do not fulfill the statutory requirements for approval. [3] Reform Act Section 333 (b).

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Given the small size of the UAs involved and the restricted environment within which they will operate, Michael's Drone Photography falls squarely within that zone of safety (an equivalent level of safety) in which Congress envisioned that the FAA must, by exemption, allow commercial operations of UAs to commence immediately. Also due to the size of the UAs and the restricted areas in which the relevant UAs will operate, approval of the application presents no national security issue. Given the clear direction in Section 333 of the Reform Act, the authority contained in the Federal Aviation Act, as amended; the strong equivalent level of safety surrounding the proposed operations, and the significant public benefit, including enhanced safety, reduction in environmental impacts, including reduced emissions associated with allowing UAs for aerial videography and photography operations, the grant of the requested exemptions is in the public interest. Additionally, there is economic efficiency created with the use of Michael's Drone Photography's UAs as the typical cost to perform aerial videography and photography with helicopters and airplanes heavily multiplies the cost to business consumers and government agencies, including law enforcement, for the services which are to be provided by Michael's Drone Photography.

THE EXTENT AND BASIS OF THE RELIEF SOUGHT BY MICHAEL'S DRONE PHOTOGRAPHY

Michael's Drone Photography submits this application in accordance with the Reform Act, 112 P.L. 95 §§ 331-334, seeking relief from any currently applicable FARs operating that presently prevents Michael's Drone Photography from contemplated commercial video-graphic, photographic and other flight operations within the 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. Michael's Drone Photography's UAs meet the definition of "small unmanned aircraft" as defined in Section 331 and therefore the integration of Michael's Drone Photography's ultralight weight UAs is expressly contemplated by the Reform Act. Michael's Drone Photography would like to operate its ultralight weight UAs prior to the time period by which the Reform Act requires the FAA to promulgate rules governing such craft. Thereby, providing direct experience and valuable information for formal regulation that can be administered uniformly to all real estate related UA aerial videography and photography. The Reform Act guides the Administrator in determining the types of UAs that may operate safely in our national airspace system. These considerations include: weight, size, speed and overall capabilities of the UAs; whether the UAs will be operated near airports or heavily populated areas and; whether the UAs will be operated by line of sight.[4] Each of these items is favorable to the grant of an exemption to Michael's Drone Photography. Michael's Drone Photography's UAs utilize four (4) counter-rotating propellers for balance, control and stability. Michael's Drone Photography's UAs are equipped with GPS and auto return safety technology. Michael's Drone Photography's UAs weigh less than five (5) pounds including camera and gimbal assembly.

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[4] 112 P.L. 95 § 333 (a).

Michael's Drone Photography puts safety first when considering any UA flight. Michael's Drone Photography's small UAs are designed to hover in place via GPS and operate in less than a 24 knot (27 mph) wind. In order to increase safety plus stability and limit harm and financial loss of property, Michael's Drone Photography will not fly its UAs in winds exceeding 15 knots (17 mph). Michael's Drone Photography's established safety systems include a GPS mode that allows its UAs to hover in place when radio controls are released. Michael's Drone Photography's UAs have three modes to choose from, Michael's Drone Photography utilizes the Intelligent Orientation Control (IOC) Flight (with GPS & compass module)[5] for aerial videography and photography. This mode is the safest, most reliable and stable mode to prevent accidents and being a hazard to others. When pilot communication is lost, Michael's Drone Photography's UAs are designed to return then slowly descend to the point of takeoff. Michael's Drone Photography does not operate its UAs near airports, hospitals, police heliports or news channel heliports. Michael's Drone Photography does not operate its UAs in areas where general public is within fifty (50) to one hundred (100) yards depending on location, conditions and weather. Michael's Drone Photography's pilots and observers are constantly on alert for any manned aircraft and prepared to immediately abort and land the UA at the nearest and safest ground point in the event a manned aircraft approaches or the Michael's Drone Photography pilot or observer suspects a manned aircraft may approach the operating area of a Michael's Drone Photography UA. Michael's Drone Photography's UAs are capable of vertical and horizontal operations, and are flown only within my line of sight of the pilot. Michael's Drone Photography's UA flights generally last fifteen (15) minutes with an altitude under three hundred (300) and utilize battery power rather than combustible fuels. Michael's Drone Photography does not operate its UAs below the manufacturer's recommended minimum charge levels for operation preferring to remain well within a safe operating range to insure adequate communication between radio control and the UAs to eliminate potential for crashes, loss of control or hazard. Fully charged reserve batteries are on hand with to insure replacement for a sufficiently safe level of operation. Michael's Drone Photography operates very conservatively and does believe in taking risks that may cause a crash or that could create hazard to the public, property and manned aircraft. Michael's Drone Photography's pilots have logged numerous practice flights in order to simulate flights for future commercial use to gain familiarization with the characteristics of this specific UA's performance under different temperature and weather conditions.

Michael's Drone Photography is extremely cautious when operating of its UAs and will not "create a hazard to users of the national airspace system or the public."[6] Given the small size and weight of Michael's Drone Photography's UAs, they fall well within Congress's contemplated safety zone when it promulgated the Reform Act and the corresponding directive to integrate UAs

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into the national airspace system. Michael's Drone Photography's UAs, utilized in hobby flight, has a demonstrable safety record and do not pose any threat to the general public or national security.

[5] Intelligent Orientation Control (IOC) Flight (with GPS & compass module) includes safe circle for operation, position hold, self-leveling, altitude command, GPS, return home feature, and safety control to return home or land in the event of communication interruption between RC transmitter and UAS. See Exhibit "1" – Phantom 1 User Manual.

[6] 112 P.L. 95 § 333 (b).

MICHAEL'S DRONE PHOTOGRAPHY'S REQUEST WILL BENEFIT THE PUBLIC AT LARGE

Aerial videography and photography for geographical awareness and for real estate marketing and promotion has been around for a long time through the use of manned fixed wing aircraft and helicopters. The challenge for smaller real estate companies and average landowners is that the expense related to manned videography and photography is cost prohibitive. Typically, only large businesses, large high end real estate companies and high net worth landowners are able to absorb such an enormous expense. This deprives non-luxury landowners and small revenue real estate companies from the enjoying the benefit of this valuable marketing and promotional tool. Manned aircraft pose a clear threat to the general public through potential catastrophic crashes that may occur. There are many documented events where a manned aircraft has crashed into populated areas with the size and combustibility of these manned aircraft causing large property damage, human injuries and loss of life. Michael's Drone Photography's UAs pose no such threat since size and lack of combustible fuel alleviates any of these potential threat to the public.

With the passage of the Reform Act, Congress has already proclaimed that it is in the public's interest to integrate commercially flown UAs into the national airspace system. The grant of the exemption request by Michael's Drone Photography furthers the public interest through academic and visual awareness of the geographical benefits of certain areas and by making this cost effective alternative available to small real estate companies and the average landowner. Michael's Drone Photography's ultralight UAs are battery powered and create no emissions that may harm the environment. In the unlikely event of a Michael's Drone Photography UA crash, the consequence is far less than a full size helicopter or fixed wing aircraft, which are heavy and contain combustible fuel, crashing and causing catastrophic devastation to the public.

The public's interest is furthered as Michael's Drone Photography minimizes ecological and crash threat by permitting aerial videography and photography captured through Michael's Drone Photography's battery operated ultralight UA's. Permitting Michael's Drone Photography to immediately fly within national air space furthers not only public safety but economic growth.

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Granting Michael's Drone Photography's exemption request substantially furthers the economic impact for any community and for companies looking to relocate or build in a certain community as well as individuals looking to relocate to a community for career advancement through academic and geographical awareness provided by Michael's Drone Photography. In the end, the granting of this exemption to Michael's Drone Photography will serve as a benefit and stimulus to any community.

MICHAEL'S DRONE PHOTOGRAPHY'S EXEMPTION WILL NOT ADVERSELY AFFECT SAFETY AND WILL PROVIDE A LEVEL OF SAFETY AT LEAST EQUAL TO EXISTING FAA STANDARDS

Michael's Drone Photography's exemption will not adversely affect safety, as it will in fact enhance safety. Michael's Drone Photography's ability to log significant, controlled and monitored flight time in FAA controlled airspace will allow Michael's Drone Photography to contribute to the innovation and implementation of new, novel and undiscovered safety protocols for realtors that may be embraced by the NAR[2] through consistent and ongoing cooperation with the FAA. Additionally, the FAA may utilize the new safety protocols for the use of UAs in FAA controlled airspace for all industries.

Michael's Drone Photography submits the following representations of enhancements to current aerial videography and photography:

- Michael's Drone Photography's UAs weigh less than 5 pounds (2.26796 Kg) complete with the camera and gimbal assembly;
- Michael's Drone Photography will only operate its UAs below three hundred (300) feet which is well within the four hundred (400) feet ceiling having been established by the Reform Act of 2012;
- Michael's Drone Photography's UAs only operate for fifteen (15) minutes per flight;
- Michael's Drone Photography lands its UAs prior to manufacturer's recommended minimum level of battery power;
- Michael's Drone Photography's pilots operate the UAs through Visual Line of Sight only;
- Michael's Drone Photography's UAs have a GPS flight safety feature whereby the UA hovers and then slowly lands if communication with the pilot is lost;

[2] National Association of Realtors, http://www.realtor.org/

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- Michael's Drone Photography actively analyzes its flight data and other sources of information to constantly update and enhance its safety protocols;
- Michael's Drone Photography only operates in reasonably safe environments which are strictly controlled and away from power lines, elevated lights, airports and actively populated areas;
- Michael's Drone Photography conducts extensive pre-flight inspections and protocol to ensure safety remains the primary concern;
- Michael's Drone Photography always obtains all necessary permissions from the FAA and landowners prior to the operation its UAs and;
- Michael's Drone Photography has established safety procedures in place to abort flights in the event of safety breaches or any potential danger.

Michael's Drone Photography's safety protocols provide a level of safety equal to or exceeding existing FAA rules. It is important to note that absent the integration of commercial UAs into our national airspace system, manned fixed wing airplanes and helicopters are the primary means of aerial videography and photography for community awareness and real estate uses. While the safety record of such helicopters is outstanding, there have been incidents involving loss of life as well as extensive property damage due to crashes of these manned aircraft and it is far safer and less expensive to operate a battery powered Michael's Drone Photography's ultralight UAs to accomplish the same task. The potential for loss of life is great diminished with a UA as Michael's Drone Photography's UAs carry no people or fuel on board and the UAs are also very small and versatile which allows Michael's Drone Photography to avoid hazards quickly and safely.

Accordingly, Michael's Drone Photography respectfully requests that the FAA grant the requested exemption without delay.

AIRCRAFT AND EQUIVALENT LEVEL OF SAFETY

Michael's Drone Photography proposes that the exemption requested herein apply to civil aircraft that have the characteristics and that operate with the limitations listed herein. These limitations provide for at least an equivalent or even higher level of safety to operations under the current regulatory structure because the proposed operations represent a safety enhancement to the operations conducted with conventional aircraft. The FAA has noted in past exemptions that "Conventional aerial video operations, using jet or piston-powered aircraft present risks associated with aircraft that weigh in the neighborhood of 5,000 to 7,000 pounds or more, carry large quantities of fuel, passengers, and, in some cases, cargo. Such aircraft must fly to and from the survey location. Please see FAA Exemption 11110.

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These limitations and conditions to which Michael's Drone Photography agrees to be bound when conducting all operations under an FAA issued exemption include:

1. The UAs will weigh less than five (5) pounds (2.26796 Kg).
2. Maximum total flight time for each operational flight will be fifteen (15) minutes. Flights will be terminated at thirty percent (30%) battery power reserve should that occur prior to the fifteen (15) minute limit.
3. Flights will be operated at an altitude of no more than three hundred (300) feet AGL.
4. Minimum crew for each operation will consist of the UA Pilot and a Visual Observer ("**VO**").
5. The UAs will only operate within a safe area.
6. A briefing will be conducted with regard to the planned UA operations prior to flight operations. It will be mandatory that all personnel who will be performing duties with regard to the flight operations be present for this briefing.
7. The Pilot and VO will have been trained in operation of UAs generally and received up-to-date information on the particular UA to be operated and the UA will be operated in conformity with Michael's Drone Photography's protocols.
8. The PILOT and VO will at all times be able to communicate via voice communication.
9. Written and/or oral permission from the relevant property holder(s), or their authorized representative(s), will be obtained.
10. All required permissions and permits will be obtained from territorial, state, county or city jurisdictions, including local law enforcement, fire, or other appropriate governmental agencies.
11. If the UA loses communications or loses its GPS signal, the UA will return to the launch site of the UA, or another more appropriate site, and land.
12. The UA will have the capability to abort a flight in case of unpredicted obstacles or emergencies.

14 C.F.R. PART 21, SUBPART H: AIRWORTHINESS CERTIFICATES 14 C.F.R. §91.203 (A) (1)

Subpart H, entitled Airworthiness Certificates, establishes the procedural requirements for the issuance of airworthiness certificates as required by FAR §91.203 (a) (1). Given the size and limited operating area associated with the aircraft to be utilized by Michael's Drone Photography, an exemption from Part 21 Subpart H meets the requirements of an equivalent level of safety under Part 11 and Section 333 of the Reform Act. The Federal Aviation Act (49 U.S.C.§44701 (f)) and Section 333 of the Reform Act both authorize the FAA to exempt aircraft from the requirement for an airworthiness certificate, upon consideration of the size, weight, speed, operational capability,

and proximity to airports and populated areas of the particular UA. In all cases, an analysis of these criteria demonstrates that the UA operated without an airworthiness certificate, in the restricted environment and under the conditions proposed will be at least as safe, or safer, than a conventional aircraft (fixed wing or rotorcraft) operating with an airworthiness certificate without the restrictions and conditions proposed.

The UAs to be operated hereunder is less than five (5) pounds (2.26796 Kg) fully loaded, carries neither a pilot nor passenger, carries no explosive materials or flammable liquid fuels, and operates exclusively within a secured area. Unlike other civil aircraft, operations under this exemption will be tightly controlled and monitored by both the operator, and under the requirements and in compliance with local public safety requirements, to provide security for the area of operation as is now done with conventional aerial videography and photography. Lastly, application of these same criteria demonstrates that there is no credible threat to national security posed by the UAs, due to its size, speed of operation, location of operation, lack of explosive materials or flammable liquid fuels, and inability to carry a substantial external load.

14 C.F.R. § 45.23 (B). MARKING OF THE AIRCRAFT

The regulation requires:

> When marks include only the Roman capital letter "N" and the registration number is displayed on limited, restricted or light-sport category aircraft or experimental or provisionally certificated aircraft, the operator must also display on that aircraft near each entrance to the cabin, cockpit, or pilot station, in letters not less than 2 inches nor more than 6 inches high, the words "limited," "restricted," "light-sport," "experimental," or "provisional," as applicable.

Even though the UAs will have no airworthiness certificate, an exemption may be needed as the UAs will have no entrance to the cabin, cockpit or pilot station on which the words "limited," "restricted," "light-sport," "experimental," or "provisional," may be placed. Given the size of the UAs, two-inch lettering will be impossible. The word "experimental," or any other term as is so required, will be placed on the fuselage of the UAs in compliance with §45.29 (f).

The equivalent level of safety will be provided by having the UAs marked on its fuselage as required by §45.29 (f) where the pilot, observer and others working with the UAs will see the identification of the UAs as "Experimental." The FAA has issued the following exemptions to this regulation to Exemptions Nos. 10700, 8738, 10167 and 10167A.

14 C.F.R. § 61.113(A) & (B); 61.133(A): PRIVATE PILOT PRIVILEGES ANDLIMITATIONS; PILOT IN COMMAND; COMMERCIAL PILOT PRIVILEGES

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AND LIMITATIONS: PILOT IN COMMAND

Section 61.113(a) & (b) limit private pilots to non-commercial operations. Unlike a conventional aircraft that carries a pilot, passengers, and cargo, the UA in this case is remotely controlled with no passengers or property of others on board. Section 61.133(a) requires an individual with a commercial pilot's license to be pilot in command of an aircraft for compensation or hire. Michael's Drone Photography respectfully proposes that operator requirements should take into account the characteristics of the particular UA. Michael's Drone Photography's UAs have various built-in technical capabilities that strictly limit the potential for operation outside of the operating conditions set forth in the exemption application including a fly back to launch point to terminate the flight. Since hobbyists are not required to have a pilot license, Michael's Drone Photography requests exemption for the need of the pilot to be licensed as a pilot by the FAA.

- Detection of lost GPS or of insufficient satellites initiates an immediate return to launch location.
- Low power on the aircraft triggers escalating alarms at 30% and 15% levels.
- The aircraft weighs less than five (5) pounds (2.26796 Kg), fully loaded.

Given these safety features, Michael's Drone Photography proposes that operators of the UAs should only be required to hold a private pilot's license and not a commercial pilot's license.

Michael's Drone Photography notes that the FAA has found that safety factors permitted operation of UAs by operators with these qualifications in the case of operations pursuant to public COAs where the mandatory operating conditions specified above are present. Please see Federal Aviation Administration, Notice N-8900.227, Unmanned Aircraft Systems (UAS) Operational Approval, at 20-21 (July 30, 2013). The FAA has the statutory authority, granted at 49 U.S.C.§44701(f) to waive the pilot requirements for commercial operations.

Given these conditions and restrictions, an equivalent level of safety will be provided by allowing operation of Michael's Drone Photography's UAs without a commercial pilot's license, under the conditions set forth herein.

The risks associated with the operation of Michael's Drone Photography's UAs (given its size, speed, operational capabilities, and lack of combustible fuel) are so diminished from the level of risk associated with private pilot operations or commercial operations contemplated by Part 61 with conventional aircraft (fixed wing or rotorcraft), that allowing operations of the UAs as set forth above meets or exceeds the present level of safety provided under 14 C.F.R. § 61.113(a) &

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(b) and does not rise to the level of requiring a commercial pilot to operate the aircraft under §61.133(a).

Sections 61.113 (a) & (b) limit private pilots to non-commercial operations. Because the UAs will not carry a pilot or passengers, the proposed operations can achieve the equivalent level of safety of current operations by requiring the PILOT operating the aircraft to have a private pilot's license rather than a commercial pilot's license to operate these small UAs. Unlike a conventional aircraft that carries the pilot and passengers, the UAs are remotely controlled with no living thing on board. The area of operation is controlled and restricted, and all flights are planned and coordinated in advance. The level of safety provided by Michael's Drone Photography's exceeds that provided by a single individual holding a commercial pilot's certificate operating a conventional aircraft. The risks associated with the operation of the UAs are so diminished from the level of risk associated with commercial operations contemplated by Part 61 when drafted, that allowing operations of the UAs as requested with a private pilot as the PILOT exceeds the present level of safety achieved by 14 C.F.R. §61.113 (a) & (b).

14 C.F.R. §91.7(A): CIVIL AIRCRAFT AIRWORTHINESS

The regulation requires that no person may operate a civil aircraft unless it is in airworthy condition. As there will be no airworthiness certificate issued for the aircraft, should this exemption be granted, no FAA regulatory standard will exist for determining airworthiness. Given the size of the aircraft and the requirements for maintenance and use of safety check lists prior to each flight.

14 C.F.R. § 91.9 (B) (2): CIVIL AIRCRAFT FLIGHT MANUAL IN THE AIRCRAFT

Section 91.9 (b) (2) provides:

> No person may operate a U.S. registered civil aircraft …
>
> (2) For which an Airplane or Rotorcraft Flight Manual is not required by §21.5 of this chapter, unless there is available in the aircraft a current approved airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof.

The UAs, given their size and configuration has no ability or place to carry such a flight manual on the aircraft, not only because there is no pilot on board, but because there is no room or capacity to carry such an item on the aircraft.

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The equivalent level of safety will be maintained by keeping at the ground control point where the pilot flying the UAs will have immediate access to it. The FAA has issued the following exemptions to this regulation: Please see FAA Exemption Nos. 8607, 8737, 8738, 9299, 9299A, 9565, 9565B, 10167, 10167A, 10602, 32827, and 10700.

14 C.F.R. § 91.103: PREFLIGHT ACTION

This regulation requires each pilot in command to take certain actions before flight to insure the safety of flight. As FAA approved rotorcraft flight manuals will not be provided for the aircraft an exemption will be needed. An equivalent level of safety will be provided. The PILOT will take all actions including reviewing weather, flight battery requirements, landing and takeoff distances and aircraft performance data before initiation of flight.

14 C.F.R. §91.109: FLIGHT INSTRUCTION

Section 91.109 provides that no person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls.

UAs and remotely piloted aircraft, by their design do not have fully functional dual controls. Flight control is accomplished through the use of a control box that communicates with the aircraft via radio communications. The FAA has approved exemptions for flight training without fully functional dual controls for a number of aircraft and for flight instruction in experimental aircraft. Please see FAA Exemption Nos. 5778K & 9862A. The equivalent level of safety is provided as neither a pilot nor passengers will be carried in the aircraft and by the size and speed of the aircraft.

14 C.F.R. §91.119: MINIMUM SAFE ALTITUDES

Section 91.119 establishes safe altitudes for operation of civil aircraft. Section 91.119(d) allows helicopters to be operated at less than the minimums prescribed, provided the person operating the helicopter complies with any route or altitudes prescribed for helicopters by the FAA. As this exemption is for UAs that are a helicopter and the exemption requests authority to operate at altitudes up to three hundred (300) feet AGL, an exemption may be needed to allow such operations. As set forth herein, except for the limited conditions, the UAs will never operate at higher than three hundred (300) feet AGL. It will however be operated in a restricted area with security perimeter, where buildings and people will not be exposed to operations without their pre-obtained consent.

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The equivalent level of safety will be achieved given the size, weight, speed of the UAs as well as the location where it is operated. No flight will be taken without the permission of the property owner or local officials. Because of the advance notice to the property owner(s), or their authorized representative(s), all affected individuals will be aware of the planned flight operations. When one compares the flight operations proposed herein with aircraft or rotorcraft weighing far in excess of the less than five (5) pounds (2.26796 Kg) and the lack of flammable fuel, any risk associated with these proposed operations is far less than those presently presented with conventional aircraft operating at or below five hundred (500) feet AGL. In addition, the low-altitude operations of the UAs will ensure separation between these small UAs operations and the operations of conventional aircraft that must comply with Section 91.119.

14 C.F.R. §91.121 ALTIMETER SETTINGS

This regulation requires each person operating an aircraft to maintain cruising altitude by reference to an altimeter that is set "...to the elevation of the departure airport or an appropriate altimeter setting available before departure." As the UA may not have a barometric altimeter, but instead a GPS altitude read out, an exemption may be needed. An equivalent level of safety will be achieved by the operator, confirming the altitude of the launch site shown on the GPS altitude indicator before flight.

14 C.F.R. § 91.151(A): FUEL REQUIREMENTS FOR FLIGHT IN VFR CONDITIONS

Section 91.151 (a) prohibits an individual from beginning "a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing, and, assuming normal cruising speed – (1) During the day, to fly after that for at least 30 minutes; or (2) At night, to fly after that for at least 45 minutes."

Michael's Drone Photography believes that an equivalent level of safety can be achieved by limiting flights to fifteen (15) minutes or thirty percent (30%) of battery power whichever happens first. This restriction would be more than adequate to return the UAs to their planned landing zone from anywhere in its limited operating area.

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

14 C.F.R. §91.203 (A) AND (B): CARRYING CIVIL AIRCRAFT CERTIFICATION AND REGISTRATION

The regulation provides in pertinent part:

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(a) Except as provided in § 91.715, no person may operate a civil aircraft unless it has within it the following:

(1) An appropriate and current airworthiness certificate. . . .

(b) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under §91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

The UAs fully loaded weight is no greater than five (5) pounds (2.26796 Kg) and is operated without an onboard pilot. As such, there is no ability or place to carry certification and registration documents or to display them on the UA.

An equivalent level of safety will be achieved by keeping these documents at the ground control point where the pilot flying the UA will have immediate access to them to the extent they are applicable to the UA. The FAA has issued numerous exemptions to this regulation. A representative sample of other exceptions includes Exemption Nos. 9565, 9665, 9789, 9789A, 9797, 9797A, 9816A, and 10700.

14 C.F.R. §91.405 (A); 407 (A) (1); 409 (A) (2); 417(A) & (B): MAINTENANCE INSPECTIONS

These regulations require that an aircraft operator or owner "shall have that aircraft inspected as prescribed in subpart E of this part and shall between required inspections, except as provided in paragraph (c) of this section, have discrepancies repaired as prescribed in part 43 of this chapter...," and others shall inspect or maintain the aircraft in compliance with Part 43.

Given that these section and Part 43 apply only to aircraft with an airworthiness certificate, these sections will not apply to Michael's Drone Photography. Maintenance will be accomplished by the operator pursuant to the flight manual and operating handboo. An equivalent level of safety will be achieved because these small UAs are very limited in size and will carry a small payload and operate only in restricted areas for limited periods of time. If mechanical issues arise the UAs may land immediately and will be operating from no higher than three-hundred (300) feet AGL. The operator will ensure that the UAs are in working order prior to initiating flight, perform required maintenance, and keep a log of any maintenance performed. Moreover, the operator is the person most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition to provide the equivalent level of safety.

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

Michael's Drone Photography seeks an exemption from the following rules:

14 C.F.R. §21, subpart H; 14 C.F.R 45.23(b);14 C.F.R. §§ 61.113(a) & (b);91.7 (a); 91.9 (b) (2);91.103(b);91.109; 91.119; 91.121; 91.151(a);91.203(a) and (b); 91.405 (a); 91.407 (a) (1); 91.409 (a) (2); 91.409 (a) (2) and 91.417 (a) & (b) to operate commercially a small unmanned vehicle weighing less than fifty-five (55) pounds (25 Kg) in its operations.

Approval of exemptions allowing commercial operations of UAs in the purposes outlined above (or similar operations) will enhance safety by reducing risk. Conventional aerial videography and photography operations, using jet or piston power aircraft, operate at extremely low altitudes just feet from the object being photographed and often in extreme proximity to people and structures; and present the risks associated with vehicles that weigh in the neighborhood of four thousand (4,000) pounds, carrying large amounts of jet A or other fuel (one hundred and forty (140) gallons for jet helicopters). Such aircraft must fly to and from the site's location. In contrast, a UA weighing less than five (5) pounds (2.26796 Kg) pounds and powered by batteries eliminates virtually all of that risk given the reduced mass and lack of combustible fuel carried on board. The UA is carried to the site of the purposes outlined above (or similar operations) and not flown to the site. The UA will carry no passengers or crew and, therefore, will not expose them to the risks associated with manned aircraft flights.

The operation of small UAs, weighing less than five (5) pounds (2.26796 Kg), conducted in the strict conditions outlined above, will provide an equivalent level of safety supporting the grant of the exemptions requested herein, including exempting Michael's Drone Photography from the requirements of Part 21 and allowing commercial operations. These lightweight aircraft operate at slow speeds, close to the ground, and in a sterile environment and, as a result, are far safer than conventional operations conducted with turbine helicopters operating in close proximity to the ground and people.

PRIVACY

All flights will occur over private, controlled or approved property with the property owner's, or their authorized representative, prior consent and knowledge. The aerial videography and photography will be of structures and property whose owner, or authorized representative, has consented to the aerial videography and photography or otherwise have agreed to be in the area

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where aerial videography and photography will take place. The grant of this exemption request will provide improved safety in all operations.

Satisfaction of the criteria provided in Section 333 of the Reform Act of 2012 - size, weight, speed, operating capabilities, proximity to airports and populated areas and operation within visual line of sight and national security – provide more than adequate justification for the granting of the requested exemptions allowing commercial operation of Michael's Drone Photography's UAs.

SUMMARY OF MICHAEL'S DRONE PHOTOGRAPHY'S REQUEST FOR AN FAA EXEMPTION

1. Michael's Drone Photography's UAs must weigh less than five (5) pounds (2.26796 Kg), including energy source(s) and equipment. Operations authorized by the grant of an exemption are limited to the following aircraft: Michael's Drone Photography's UA aircraft variant, bearing serial #PH645210898 onward as additional UAs are utilized by Michael's Drone Photography provided the additional UAs are of the same or similar specifications as the UA bearing serial # PH645210898. Any proposed operations of any other aircraft will require a new petition or a petition to amend this grant.

2. Michael's Drone Photography's UAs may not be flown at a ground speed exceeding thirty (30) knots.

3. Michael's Drone Photography's flights must be operated at an altitude of no more than three hundred (300) feet above ground level (AGL), as indicated by the procedures. All altitudes reported to ATC must be in feet AGL.

4. Michael's Drone Photography's UAs must be operated within the VLOS of the PILOT at all times. This requires the PILOT to be able to use human vision unaided by any device other than corrective lenses.

5. All Michael's Drone Photography operations must utilize a VO. The VO may be used to satisfy the VLOS requirement as long as the PILOT always maintains VLOS capability. The VO and PILOT must be able to communicate verbally at all times.

6. Prior to each flight the PILOT must inspect the UA to ensure it is in a condition for safe flight. If the inspection reveals a condition that affects the safe operation of the UA, the aircraft is prohibited from operating until the necessary maintenance has been performed and the UA is found to be in a condition for safe flight. A Ground Control Station, if utilized, must be included

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in the preflight inspection. All maintenance and alterations must be properly documented in the aircraft records.

7. Any UA that has undergone maintenance or alterations that affect the UA's operation or flight characteristics, e.g. replacement of a flight critical component, must undergo a functional test flight. The PILOT who conducts the functional test flight must make an entry in the UA's aircraft records of the flight.

8. Michael's Drone Photography must follow the manufacturer's UA aircraft/component, maintenance, overhaul, replacement, inspection, and life limit requirements. When unavailable, aircraft maintenance/component/overhaul, replacement, and inspection/maintenance requirements must be established and identified. At a minimum, requirements for the following may be included in protocols and controls to be established by Michael's Drone Photography:

a. Actuators/Servos;
b. Transmission (single rotor);
c. Power plant (motors);
d. Propellers;
e. Electronic speed controller;
f. Batteries;
g. Mechanical dynamic components (single rotor);
h. Remote command and control;
i. Ground control station (if used); and
j. Any other components as determined by Michael's Drone Photography.

10. Prior to operations conducted for the purposes outlined above (or similar operations), the PILOT must have accumulated and logged, in a manner consistent with 14 CFR § 61.51(b), a minimum of twenty-five (25) hours of total time as a UA rotorcraft pilot (single blade or multi-rotor) and at least ten (10) hours logged as a UA pilot with multi-rotor UA which is similar to the UA to be utilized pursuant to this exemption. Prior documented flight experience that was obtained in compliance with applicable regulations may satisfy this requirement. Training, proficiency, and experience-building flights must be conducted under an exemption to accomplish the required flight cycles and flight time. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PILOT must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.

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11. Prior to operations conducted for the purposes outlined above (or similar operations), the PILOT must have accumulated and logged, in a manner consistent with 14 CFR § 61.51(b), a minimum of five (5) hours as a UA pilot operating the make and model of UAs to be utilized for operations under the exemption and three (3) take-offs and three (3) landings in the preceding ninety (90) days. Training, proficiency, experience-building, and take-off and landing currency flights can be conducted under the grant of exemption to accomplish the required flight time and ninety (90) day currency. During training, proficiency, experience-building, and take-off and landing currency flights all persons not essential for flight operations are considered nonparticipants, and the PILOT must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.

12. Michael's Drone Photography shall not permit the PILOT to operate the UAS for the purpose of aerial videography or photography (or similar operations), unless the PILOT 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 this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from people, vessels, vehicles and structures.

13. The UA may not be operated directly over any person, except authorized and consenting personnel and persons, below an altitude that is hazardous to persons or property on the surface in the event of a UA's failure or an emergency.

14. At all times, those persons must be essential to the purposes outlined above (or similar operations). Because these procedures are specific to participating persons, no further FSDO or aviation safety inspector approval is necessary for reductions to the distances specified in Michael's Drone Photography's manuals.

15. Michael's Drone Photography's 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 and/or;
b. The aircraft is operated near vessels, vehicles or structures where the owner/controller of such vessels, vehicles or structures has granted permission and the PILOT 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;

c. Operations nearer to the PILOT, VO, operator trainees or essential persons do not present an undue hazard to those persons per § 91.119(a).

16. If the UAs lose communications or loses its GPS signal, the UAs must return to a pre-determined location within the security perimeter and land or be recovered.

17. The UAs must abort the flight in the event of unpredicted obstacles or emergencies.

18. Each UA operation must be completed within fifteen (15) minutes flight time or with thirty percent (30%) battery power remaining, whichever occurs first.

19. Michael's Drone Photography must obtain an Air Traffic Organization (ATO) issued Certificate of Waiver or Authorization (COA) prior to conducting any operations under this grant of exemption. This COA will also require Michael's Drone Photography to request a Notice to Airman (NOTAM) not more than seventy-two (72) hours in advance, but not less than forty-eight (48) hours prior to the operation.

20. 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.

21. Michael's Drone Photography has developed procedures to document and maintain a record of the UA's maintenance, preventative maintenance, alterations, status of replacement/overhaul component parts, and the total time in service of the UAs.

22. Each UA operated under this exemption must comply with all manufacturer Safety Bulletins.

23. The preflight inspection section in Michael's Drone Photography's Confidential Protocols and Controls Exhibit includes the following requirement: The preflight inspection must account for all discrepancies, i.e. inoperable components, items, or equipment, not covered in the relevant preflight inspection.

24. Before conducting operations, the radio frequency spectrum used for operation and control of the UA must comply with the Federal Communications Commission (FCC) or other appropriate government oversight agency requirements.

25. The documents required under 14 CFR §§ 91.9 and 91.203 must be available to the PILOT at the Ground Control Station, if utilized, of the UA at any time the UA is operating. These

documents must be made available to the Administrator or any law enforcement official upon request.

26. Michael's Drone Photography's UAs must remain clear and yield the right of way to all other manned operations and activities at all times (including, but not limited to, ultralight vehicles, parachute activities, parasailing activities, hang gliders, etc.).

27. Michael's Drone Photography's UA 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.

28. Michael's Drone Photography's UAs may not be operated by the PILOT from any moving device or vehicle.

29. Michael's Drone Photography's UAs may not be operated less than five-hundred (500) feet below or less than two-thousand (2,000) feet horizontally from a cloud or when visibility is less than three (3) statute miles from the PILOT.

30. Michael's Drone Photography's UA may not operate in Class B, C, or D airspace without written approval from the FAA. The UA may not operate within five (5) nautical miles of the geographic center of a non-towered airport as denoted on a current FAA-published aeronautical chart unless a letter of agreement with that airport's management is obtained, and the operation is conducted in accordance with a NOTAM as required by the Michael's Drone Photography's COA. The letter of agreement with the airport management must be made available to the Administrator upon request.

31. 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 UA Integration Office (AFS-80) within twenty-four (24) hours. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.ntsb.gov.

32. Michael's Drone Photography's UAs, the UA's PILOT, and the UA's operations must comply with all applicable parts of 14 CFR including, but not limited to, parts 45, 47, 61, and 91.

As mentioned above, the FAA has already granted a previous exemption which is essentially identical to the exemption being sought by Michael's Drone Photography in this petition for an exemption. Please see FAA Exemption No. 11138.

Therefore, Michael's Drone Photography respectfully requests the FAA grant an exemption pursuant to its application as outlined above.

Sincerely,

Dannette J. Myers,
Manager
Michael's Drone Photography, L.L.C.

Thank you for your consideration.

Michael's Drone Photography, 1850 Golden Gate Avenue, Kingman, Arizona 86401
Phone: (928) 897-2631

PHANTOM

Advanced Manual

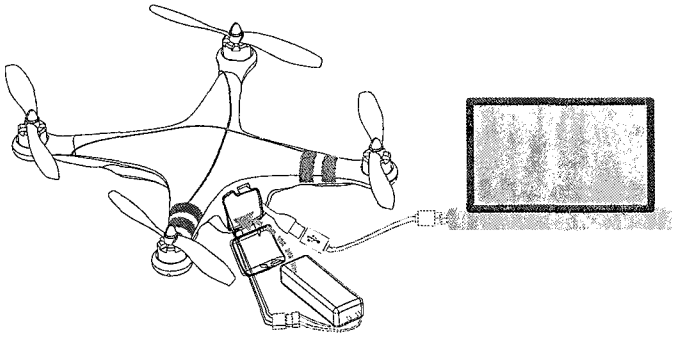
V 1.4
2013.03.22 Revision

Index

A1 Software and Driver Installation

Make sure to use the NAZA-M assistant software of 2.0 version (or above 2.0) to carry out firmware upgrade and parameter configuration. DO NOT use the NAZA-M assistant software bellow 2.0 version

1. Please download the driver DJI Driver Installer and NAZA-M assistant software from the PHANTOM page of DJI website (http://www.dji-innovations.com/products/phantom/downloads/).
2. Connect the PHANTOM and the PC via the USB cable, power on the PHANTOM system.
3. Run the DJI Driver Installer, and follow the instructions strictly to finish installation.
4. Run the assistant software installer, and follow the instructions strictly to finish installation.



A2 Configuration and Firmware& Software Upgrade

1. Power on your computer. Make sure the computer is connected to the Internet for the first time you use.
2. Switch on the transmitter first, then power on the aircraft. Connect the aircraft to the PC with the USB cable. DO NOT break the connection until configuration or upgrade is finished.
3. Please refer to the **"Assembly &Configuration->Step3"** section of NAZA-M Quick Start Guide to get the detail of assistant software usage.
4. Refer to the **"Appendix->** Firmware & Assistant Software Upgrade" section of NAZA-M Quick Start Guide to get the detail of assistant software usage.
5. If Manual Mode is required, please select "Manual" from the drop down list of Basic->RC->Control Mode Switch in the assistant software. Refer to the **"Flying Test->** Step 1 Control Mode Knowledge" section of NAZA-M Quick Start Guide to get the detail about the Manual Mode.

A3 Linking the Transmitter and Receiver

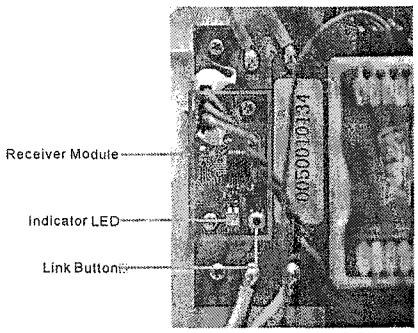
The linking of the transmitter to the receiver of the PHANTOM was carried out before they left the factory. If necessary you can link the transmitter to the receiver as follows, for example you replace the transmitter. The default receiver type is PPM.

DO NOT use the PHANTOM transmitter (receiver) with the third party remote control equipment.

1. Please remove the housing by referring to the section of **A8 Maintenance -> Remove the Housing.**
2. Locate the receiver module according to the following figure.
3. After powering on the aircraft and the transmitter, if the LED indicator of the receiver on the control board is lit solid red, this means the receiver currently has no connection with any transmitter.
4. Press down the link button for more than two seconds until the LED indicator blinks, then release the button.
5. Push the throttle stick to the lowest position and turn on the transmitter. Then if the LED indicator of the receiver turns off, the link between the transmitter and the receiver has succeeded. (Linking operation can be done only when the LED indicator of the transmitter changes to blinking red.)

Note:

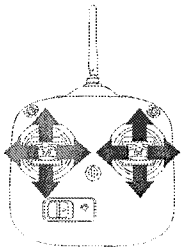
- If the transmitter can't enter the linking mode, please check that the throttle stick lies in the lowest position.
- You can use your R/C system normally only after the linking is done successfully.



A4 Changing the Control Mode of the Transmitter

You can change the operation mode of the transmitter according to the following procedures if necessary(The operation mode of Mode1 and Mode2 are shown as below.)

Make sure to carry out the **A5 Transmitter Calibration**, if the Control Mode of the Transmitter is changed

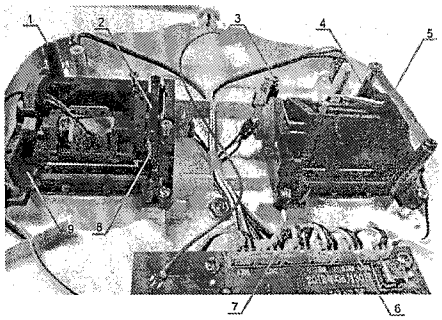


Mode1: Throttle, it cannot hold the central position when released.
Roll, it can return to the central position when released.
Pitch, it can return to the central position when released.
Yaw, it can return to the central position when released.

Mode2: Throttle, it cannot hold the central position when released.
Roll, it can return to the central position when released.
Pitch, it can return to the central position when released.
Yaw, it can return to the central position when released.

1. Remove the right Throttle Ratchet plate and the Ratchet Nut. Assemble the Ratchet Nut to the Nut Hole Location, and fix the Throttle Ratchet onto the Ratchet Nut and the Screw Hole Location. Adjust the screw height of the Throttle Support to change the tension, so as to give you the required operating feel.
2. Remove the left Centering Unit and the Centering Spring. Assemble them to the corresponding position of the Right part (Close to the middle location of the transmitter). Then adjust the height of the Adjusting Screw, so as to give you the required operating feel. (Note: Be careful not to excessively tension the spring when moving and fixing, to avoid damage.)
3. Exchange the connectors of Channel 2(AIN2) and Channel 3 (AIN3). (Note: Take care about the connector direction.) □

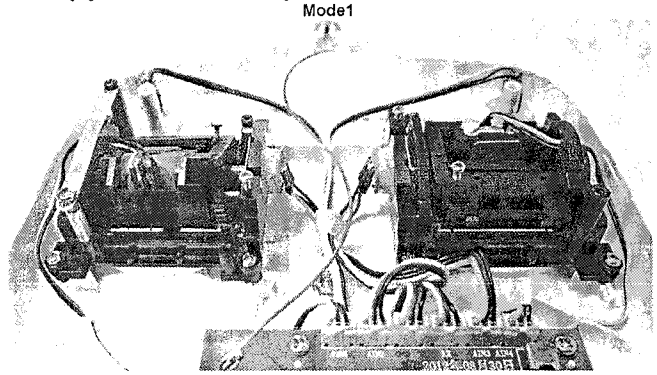
Mode2



NO.	Name
1	Screw Hole Location
2	Centering Unit
3	Adjusting Screw
4	Ratchet Nut
5	Throttle Ratchet
6	3rd Channel
7	2nd Channel
8	Centering Spring
9	Nut Hole Loc tion

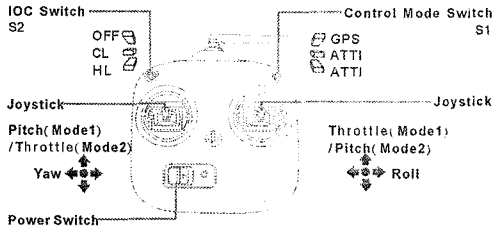
The following figure shows the successful change of transmitter mode to Mode 1.

Mode1



A5 Transmitter Calibration

If the control mode of the transmitter is changed or calibration has not been carried out for a long time, transmitter calibration is necessary.



CL: Course Lock

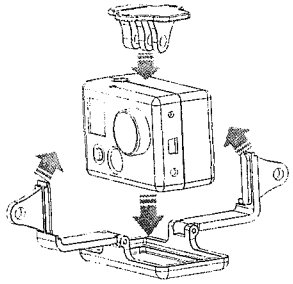
HL: Home Lock

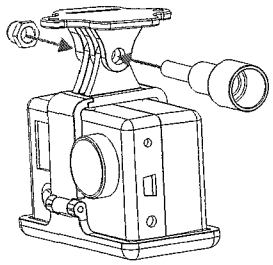
1. Set the switch S2 at the OFF position, and the switch S1 at the GPS position.
2. Push the Throttle stick to the top position, and push the Pitch stick to the top position. Keep the Pitch stick at the top position manually since it can return to the central position when released.
3. Turn on the Power Switch of the transmitter, you should hear the indicator sound of "Di—Di Di" from the transmitter repeatedly. Toggle the switch S2 to the CL position, you should hear an indicator sound of "Di" from the transmitter, in this case, the transmitter has entered the calibration mode. (During this period, the Throttle stick and the Pitch stick must be kept at the top position all the time.)
4. Release the Pitch stick and pull the Throttle stick to the central position. Toggle the switch S1 to the ATTI position; you should hear an indicator sound of "Di" from the transmitter. Then move all of the sticks throughout their complete range several times. After this, put the Throttle stick to the bottom position, and toggle the switch S2 to the HL position, you should hear an indicator sound of "Di" from the transmitter, in this case, the transmitter has been calibrated successfully.

A6 Mount Camera and Camera Frame

Please mount the Camera and Camera Frame if necessary.

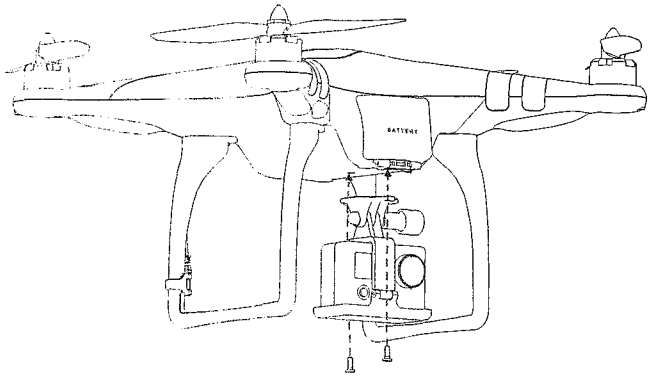
(1) Mount the Camera to the Camera Frame





(2) Mount the Camera and Camera Frame to the aircraft

Make sure to use the dedicated cross screws of the type M3.0*6, since an over long screw will puncture the battery by passing through the battery compartment and could lead to explosion or fire.



A7 Intelligent Orientation Control (IOC) Flight (with GPS & Compass module)

Make sure to open the IOC function in the NAZA-M assistant software before using.

Definition of Forward Direction: Quad -rotor will fly along this direction when you push the elevator stick.

Graphic Description

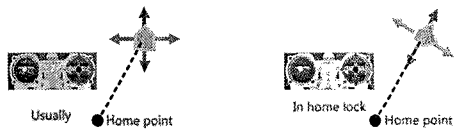
Nose direction → Forward direction ● Home point ----- Over 10m from Home point

Before You Start

Usually, the forward direction of a flying aircraft is the same as the nose direction. By using IOC, wherever the nose points, the forward direction has nothing to do with nose direction:

□ In course lock flying, the forward direction is the same as a recorded nose direction. See the following figures (The red and blue arrows on the transmitter is corresponding to pitch and roll operations):

□ In home lock flying, the forward direction is the same as the direction from home point to aircraft. See the following figures (The red and blue arrows on the transmitter is corresponding to pitch and roll operations):



Method of Forward Direction & Home Point Recording

If you use the IOC function, please keep the Forward Direction of Course Lock Flying and the home point of Home Lock Flying in mind at any time. There are two ways to record the forward direction and the home point: Manually and Automatically. You may choose any one record method.

	Course Lock Flight	Home Lock Flight
Automatically	30 seconds after you power on the quad-rotor.	Before takeoff, the current position of the quad-rotor will be saved as home point when you push the throttle stick for the first time after 6 or more GPS satellites have been found.
Manually	Switch the S2 between OFF and CL position quickly 3 to 5 times to record current nose direction as new forward direction after you power on the quad-rotor for 30s. (OFF ->CL-> OFF is one time.)	When 6 or more GPS satellites are found, you can toggle the S2 switch between CL and HL position quickly 3 to 5 times to record the current position of the quad-rotor as the new home point. (CL -> HL -> CL is one time.)

IOC Flying Test

Realize an IOC flight by the following procedures.

During the same flight	STEP1: Record	STEP2: ON	STEP3: OFF	STEP4: ON again
Course Lock				
Switch Setting	Record forward direction	Set switch S1 to GPS or ATTI position, S2 to CL position	Set switch S2 to OFF position	Toggle switch S2 from OFF to CL position
Home Lock				
Switch Setting	Record home point	Set switch S1 to GPS position and S2 to HL position	Set switch S2 to OFF position	Toggle switch S2 from OFF to HL position

IOC FLYING NOTES !!!

- LED will blink quickly if recording is successful. LED will blink between and slowly to indicate the IOC mode only when MC is ready to fly in course lock or home lock modes.
- Home lock flying requires that 6 or more GPS satellites are found and the aircraft is further than 10m away from the home point.
- Before you do the home lock flight, you have to fly the aircraft out of the 10m range around home point, and then flip the switch S2 to HL position to fly in home lock when all the requirements are met. If you have already toggled the switch S2 to HL position when the aircraft is still in 10m range around home point, and this is the first time you are going to fly in home lock during the current flight, then if all the requirements are met, MC will change into home lock automatically when the aircraft flies out of the 10m range around home point.
- When flying in Home Lock mode, if any of the following situations happen, then the system will quit Home Lock flying and automatically enter Course Lock flying. The aircraft will fly in Course Lock using the earlier forward direction.
  1. The aircraft fly's within 10m range of the home point.
  2. You toggle the control mode switch to the ATTI. Mode.
  3. The GPS signal becomes bad (The GPS signal LED is blinking Red twice or three times).
- When the aircraft is flying in home lock mode far away from you and the home point, please do not toggle the IOC switch many times quickly so as to avoid the change of home point without you intentionally knowing.
- We suggest that you should know clearly which flight lock method you are going to fly, and you know the locked forward direction or home point, before you switch on IOC mode during the flight.
- Continuously spinning the aircraft in flight will cause a yaw error. In this case, you can stop or slow down the spinning, so as to have better flight performance.