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

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

May 5, 2015

Exemption No. 11493
Regulatory Docket No. FAA–2015–0315

Mr. Gene Payson
Troy Built Models
1650 Honore Avenue
Sarasota, FL 34232

Dear Mr. Payson:

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 January 20, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Troy Build Models (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct training and education.

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

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

Airworthiness Certification

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

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

The Basis for Our Decision

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

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

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

Our Decision

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with

14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However, training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.

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

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

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

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

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

20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the intended operation and to operate after that for at least 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 May 31, 2017, unless sooner superseded or rescinded.

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

January 20, 2015

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

Exemption Request under Section 333 of the FAA Modernization and Reform Act of 2012 and 14 C.F.R. Part 11

Dear Sir or Madam:

Troy Built Models (TBM) requests exemptions from several provisions of the Federal Aviation Regulations (FAR) in accordance with Section 333 of the FAA Modernization and Reform Act of 2012. TBM seeks exemption in order to commercially operate the Phantom 2 Vision+ unmanned aircraft system (UAS) in a sterile environment clear of people and objects for the purposes of training and educating Phantom 2 Vision+ and sUAS pilots. Phantom 2 Vision+ Trainers/Pilots in Command hold a private pilot certificate, third class medical certificate, and have passed a rigorous internal training and certification program administered by TBM senior staff as a minimum qualification. Operators are trained on the Phantom Vision 2+ following the OEM training guidelines and syllabus provided by DJI (Manufacturer of the Phantom 2 Vision+ UAS).

This exemption is in accordance with protocols outlined in this petition for exemption, the enclosed TBM's Operations Manual, TBM's UAS Aircraft Training Manual, TBM's Phantom 2 Vision+ oral and practical examination, the DJI UAS manufacturer's operations and/or instructions manual, DJI UAS User's Manuals, DJI UAS Quick Start Guides, and any other requirements established by the FAA pursuant to Section 333 of the Reform Act.

Troy Built Models is a leading company in UAS training services. It proposes to use a small, lightweight UAS – the DJI Phantom 2 Vision+ - for training purposes. The Phantom 2 Vision+ is an electric powered UAS, equipped with four motors weighing no more than three pounds.

This exemption will permit TBM to safely operate UASs under controlled conditions and in sterile environments for the purpose of flight training. Approval of this exemption will enhance overall safety and fulfill the Secretary of Transportation's (the FAA Administrator's) responsibilities to "... establish requirements for the safe operation of such aircraft systems in the national airspace system" Consistent with Section 333(c) of the Reform Act.

The name and address of the petitioner is:

Troy Built Models
Attn: Gene Payson
Phone: 941-313-0074
Email: president@troybuiltmodels.com
Address: 1650 Honore Ave, Sarasota, FL 34232

Description of Flight Operations
To preserve the safety of manned aircraft operations, the NAS, and property TBM will maintain the following limitations and conditions during all flight training operations:

1. The Phantom 2 Vision+ will weigh less than 3 pounds.

2. All flights will maintain direct visual line of sight of the Pilot In Command and trained Visual Observer (Both PIC and VO will be FAA licensed airmen and hold a current Class III medical certificate). The VO and PIC must be able to communicate verbally at all times. 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 functions prescribed in the TBM DJI Phantom Pilot Skill Training Manual.

3. Visual observers will receive no less than one hour of ground instruction on their required duties to maintain obstacle and collision avoidance for all flight operations.

4. A TBM senior company employee will observe the training sessions of TBM trainers on an ongoing basis. Each trainer will be observed by a TBM certified line check airman a minimum of 8 hours during live training every 12 months.

5. Geo-fencing will be utilized during all flight operations to maintain altitudes below 100 feet AGL and a distance not to exceed 500 feet from the pilot at all times. Real time telemetry will be monitored at all times to ensure compliance. The geo-fencing will be tested at the beginning of each flight as standard safety practice.

6. Return to Launch (RTL) will be tested at the beginning of each flight as standard safety practice.

7. If the sUAS loses communications signal, the sUAS will have the capability to return to a pre-determined location within the 'Sterile Flight Zone' and land.

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

9. Flights will be conducted in VFR conditions. Operations will be conducted at least 2,000 feet from fog conditions.

10. Prior to each flight the PIC will obtain an official weather briefing for the area of operation from CSC DUATS no more than one hour prior to the planned flight operations.

11. TBM, by following procedures listed in the Operation's Manual will assure no individuals' privacy is violated.

12. No flight operations will be conducted at night.

13. UAS will maintain a lateral distance of at least 1,500 feet from inhabited structures, buildings, vehicles, and remain in constant visual line of sight.

14. UAS will maintain a lateral distance of at least 1,500 feet from non-participants to maintain a 'Sterile Flight Zone'. If non-participants enter the 'Sterile Flight Zone', flight operations will cease immediately until the flight zone is cleared.

15. Signs displaying 'UAS Flight Operations In Progress' will be clearly positioned to keep all persons and objects clear of the 'Sterile Flight Zone'.

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

17. The Phantom 2 Vision+ 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.).

18. Prior to each flight, the PIC must inspect the Phantom 2 Vision+ to ensure it is in a condition for safe flight. If the inspection reveals a condition that affects the safe operation of the UAS, the 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.

19. Any maintenance or alterations that affect the Phantom 2 Vision+ operation or flight characteristics (e.g. replacement of a flight critical component), must undergo a functional test flight. The PIC who conducts the functional test flight must make an entry in the official maintenance logbook.

20. The operator must carry out its maintenance, inspections, and record keeping requirements, in accordance with the operating documents. Maintenance, inspection, and alterations must be noted in the aircraft logbook, including total flight hours, description of work accomplished, and the signature of the authorized maintenance personnel or PIC returning the Phantom 2 Vision+ UAS to service.

21. The operator's Phantom 2 Vision+ authorized maintenance personnel, PIC, and VO must receive and document training referenced in the TBM Flight Training Certification Procedures.

22. The UAS operated under the exemption must comply with all manufacturer System and Safety Bulletins.

23. Before conducting operations, the radio frequency spectrum used for operation and control of the UAS must comply with the Federal Communications Commission or other appropriate government oversight agency requirements. Radio control will be maintained on the 2.4ghz band. An FCC license is not needed to utilize these frequencies.

24. All operations shall be conducted in Class G airspace.

25. During operations in Class G airspace, the Phantom 2 Vision+ may not operate within 5 nautical miles of the geographic center of an 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 operator's COA.

26. 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 meeting the requirements of 49 C.F.R. Part 830 must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.ntsb.gov.

TBM requests the following exemptions under Section 333:

Part 21 Subpart H	Airworthiness certification

14 C.F.R. § 45.23(b)	Markings
14 C.F.R. § 61.113(a) and (b)	Private pilot privileges
14 C.F.R. § 61.133(a)	Commercial pilot privileges
14 C.F.R. § 91.7(a) and (b)	Civil aircraft airworthiness
14 C.F.R. § 91.109(a)	Flight Instruction
14 C.F.R. § 91.119	Minimum safe altitudes
14 C.F.R. § 91.121	Altimeter Settings
14 C.F.R. § 91.151(a)	Fuel requirements for Flight in VFR Conditions
14 C.F.R. § 91.203(a)(1) and (2)	Civil aircraft certifications
14 C.F.R. § 91.405; 407; 409; 417	Maintenance Inspections

Part 21 Subpart H

Part 21 Subpart H prescribes procedural requirements for the issue of airworthiness certificates. TBM requests exemption from this subpart to operate the Phantom 2 Vision+ without the requirement for an airworthiness certificate. Based on the proposed UAS being limited in size, weight, speed, operating capabilities, and operating within visual line of sight, TBM believes that an airworthiness certificate is not necessary to ensure an equivalent level of safety to manned aircraft operations.

14 C.F.R. § 45.23(b): Display of marks; general

As the proposed UAS does not have any entrances to the cockpit or cabin TBM requests that in order to identify the aircraft as an experimental type the word “EXPERIMENTAL” will be displayed in 2 inch lettering on the fuselage.

14 C.F.R. § 61.113(a) and (b): Private pilot privileges and limitations: Pilot in command

14 CFR 61.11 3 (a) and (b) state that:

(a) Except as provided in paragraphs (b) through (h) of this section, no person who holds a private pilot certificate may act as pilot in command of an aircraft that is carrying passengers or property for compensation or hire; nor may that person. For compensation or hire, act as pilot in command of an aircraft.

(b) A private pilot may, for compensation or hire, act as pilot in command of an aircraft in connection with any business or employment if:

(1) The flight is only incidental to that business or employment; and

(2) The aircraft does not carry passengers or property for compensation or hire.

TBM requests exemption from 14 C.F.R. § 61.113(a) and (b) to allow TBM to commercially operate the Phantom 2 Vision+ UAS with operators holding private pilot certificates. Sections 61.113 (a) & (b) limit private pilots to non-commercial operations. However provided in recent documentation, it has been determined that the private pilot and commercial pilot certifications meet the same basic knowledge of airspace through ground school and not flight

training (See Regulatory Docket No. FAA-2014-0352 page 16-17). A commercial pilot's certification ensures that a pilot is able to safely commercially operate a manned aircraft, not a UAS. Applying manned commercial pilot certification requirements do not significantly add to the safety of UAS operations. TBM's operating procedures will ensure UAS pilots are trained to conduct UAS operations with an equivalent level of safety to the training advantages obtained by a certificated commercial pilot for manned aircraft operations. All TBM trainers will be certified under the TBM Flight Training Certification Procedures.

All TBM pilots will possess a Private Pilot Certificate and current Class II medical.

14 C.F.R. § 61.133(a): Commercial pilot privileges and limitations
TBM requests exemption from 14 C.F.R. § 61.133(a) in accordance with the above request enabling an operator with a private pilot certificate to operate the Phantom 2 Vision+ UAS commercially. Based on aircraft simplicity and visual line of sight operations this exemption would not degrade safety of the NAS or manned aircraft operations.

14 C.F.R. § 91.7(a) and (b): 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 Phantom 2 Vision+ and the description of proposed operations above, an equivalent level of safety will be provided.

B. 14 CFR § 91.103: Preflight Action
TBM requests an exemption from the preflight actions requirements of 14 CFR 91.113 that prescribes the preflight actions under which aircraft may operate: Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight.

> (a) Flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed, and any known traffic delays of which the pilot in command has been advised by ATC;
>
> (b) For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information:
>
> > (1) For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing takeoff and landing distance data is required, the takeoff and landing distance data contained therein; and
> > (2) For civil aircraft other than those specified in paragraph (b)(1) of this section, other reliable information appropriate to the aircraft, relating to

aircraft performance under expected values of airport elevation and runway slope, aircraft gross weight, and wind and temperature.

All TBM flights will be conducted in VFR conditions. No takeoff and landing distances are published for the Phantom 2 Vision+ by the manufacturer. An equivalent level of safety will be provided by the PIC obtaining all pertinent weather information from an official FAA weather source (ex. Flight Service, CSC DUATS).

14 C.F.R. § 91.109(a): Flight instruction

This section 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.

For student training purposes the Pilot In Command and student will use a "buddy box" system that utilizes two transmitters. The transmitter of the student is connected by a trainer cable to another transmitter (master transmitter) controlled by the PIC instructor. The PIC Instructor is able to control the UAS with his or her transmitter then flip a switch to turn control over to the student and flip the switch again to reclaim control. In this way, the PIC Instructor can easily demonstrate how to fly the UAS or rescue the UAS if the student makes a poor aeronautical decision without passing the same transmitter back and forth to preserve safety to the NAS and manned aircraft operations.

14 C.F.R. § 91.119: Minimum safe altitudes

TBM requests an exemption from the minimum safe altitude requirements of 14 CFR 91.119 that prescribes the minimum safe altitudes under which aircraft may operate:

- Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

- Over other than congested areas at an altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

Section 91.119 (d) allows for a helicopter to operate at less than those minimum altitudes when it can be operated "without hazard to persons or property on the surface," provided that "each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA."

To provide the intended operations, the Phantom 2 Vision+ will be operated below 100 feet AGL. Additionally, the UAS will maintain a lateral distance of at least 500 feet from inhabited structures, buildings, vehicles, and remain in constant visual line of sight.

14 C.F.R. § 91.121: Altimeter Settings

This regulation requires that each person operating an aircraft shall maintain the cruising altitude or flight level of that aircraft, as the case may be, by reference to "the current reported altimeter setting of a station along the route and within 100 nautical miles of the aircraft."

TBM seeks an exemption because the Phantom 2 Vision+ does not have a barometric altimeter, but rather a GPS altitude read out. The UAS will be programmed to remain below 100 feet AGL regardless of PIC control input, thus ensuring operation at safe altitudes.

14 C.F.R. § 91.151(a): Fuel Requirements for Flight in VFR Conditions

MDV requests an exemption from 14 CFR § 91.151(a)'s fuel requirements for flight in VFR conditions. Section 91.151 states:

> (a) No person may begin 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 25 minutes; or
> (2) At night, to fly after that for at least 45 minutes.

The batteries powering the Phantom 2 Vision+ provide approximately 10-15 minutes of flight time. Training operations will be limited to a minimum voltage to ensure appropriate reserve battery to maintain an equivalent level of safety at all times. If the PIC fails to land the UAS prior to the allotted minimum voltage, the UAS will autonomously return to it's original launch position.

14 C.F.R. § 91.203(a)(1) and (2): Civil aircraft: Certifications required

Under the proposal TBM would not be operating the UAS with an airworthiness certificate as requested under the exemption for Part 21 Subpart H. The exemption for this section is required as TBM would not be able to display the airworthiness certificate in accordance with 14 C.F.R. § 91.203(a)(1) and (2).

14 C.F.R. § 91.405; 91.407; 91.409; 91.417: Maintenance/Operations/Inspections/Records

These regulations specify maintenance and inspection standards in reference to 14 CFR Part 43. 14 CFR 91.405(a) (stating that each owner or operator of an aircraft "shall have the aircraft inspected as prescribed in subpart E of this part and shall between required inspections…have discrepancies repaired as prescribed in part 43 of this chapter").

An exemption is requested as these sections requires the aircraft be inspected in accordance with Part 43 and is needed as these sections apply only to aircraft with an airworthiness certificate. An equivalent level of safety will be achieved by the Pilot In Command following the TBM Operations manual as well as the DJI User's Manuals. The operator will ensure that the UAS is in working order prior to each flight and maintain a detailed log of maintenance performed. The operator is the person most familiar with the aircraft and to provide the equivalent level of safety. The Phantom 2 Vision+ Flight Log will be provided separately for reference.

Why is this exemption request in the public's best interest?

By granting this exemption request, TBM will be able to provide exemplary flight training to its students. This training will benefit the unmanned aircraft integration process as well as maintaining the safety to manned aircraft operations in the National Airspace System. The training provided to students will lead to a better understanding of the unmanned aircrafts limitations and safety measures. This knowledge is crucial to the future of unmanned aircraft to be able to operate and not pose a threat to the safety or well-being of individuals, property on the ground, or other aircraft in the air. For all of the reasons provided in this request, granting TBM this exemption is indeed in the public's best interest.

The following appendices provided by TBM will further enhance safe operations of the Phantom 2 Vision+ UAS at all times:

Appendix A: TBM DJI Phantom Pilot Training Guide

The Pilot Skill Training is essential to train and evaluate the student's overall ability in a wide array of areas concerning safe flight operations.

Appendix B: TBM Commercial Pilot Flight Exam

The Commercial Pilot Flight Exam is the final check to evaluate the student's abilities controlling the Phantom 2 Vision+. TBM has created a Training Guide similar to the Practical Test Standards in manned operations. This Flight Guide will maintain a standard of pilot ability through maneuvers and simulated emergencies.

Appendix C: TBM Commercial Pilot Oral Exam

The TBM Phantom 2 Vision+ Oral Exam will allow students to show that they have an acceptable knowledge base on the Phantom 2 Vision+. The exam not only examines the UAS itself, but includes items such as power systems and operations, ground station operations, weather, flight operations, and Federal Aviation Regulations.

Appendix D: TBM Phantom Written Exam For Pilot Certification

The TBM Phantom 2 Vision+ Written Exam is an in depth multiple choice examination covering topics that will allow the TBM student to display their overall understanding of the Phantom 2 Vision+ and it's limitations. A score of 70 percent will be required to be allowed to receive a TBM Commercial Pilot Flight Exam.

Appendix E: Phantom 2 Vision+ Flight Log

The Phantom 2 Vision+ Flight Log will be used for every flight operation performed. It includes the date, weather, checklists, and post flight observations. The flight log will help maintain an overall level of consistency and safety during all flight operations.

Appendix F: TBM Phantom Checklists
These are the checklists for start-up, operation and shut down. These include all required activities for a safe flight.

Appendix G: TBM Phantom Inventory Checklist
This includes all the components required to take into the field for safe operation.

Appendix H: POH DJI Phantom Pilot Operating Handbook
This in depth POH was sritten by TBM for safe operation of the DJI Phantom. These are the checklists for start-up, operation and shut down. These include all required activities for a safe flight.

Appendix I: TBM DJI Phantom Training Procedures
This outlines the training standards for the TBM trainers.

Appendix J: DJI Phantom Quick Start Guide
This outlines the pilot procedures and standards as written by DJI.