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

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

September 2, 2015

Exemption No. 12730
Regulatory Docket No. FAA–2015–0791

Mr. Kenneth Shelton
Ken Shelton Photography
7546 Trillium Boulevard
Sarasota, FL 34241

Dear Mr. Shelton:

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

By letter posted to the public docket on March 26, 2015, and by letter dated July 8, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Ken Shelton Photography (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography for the education of real estate professionals and real estate marketing.

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 Yuneec Q500 Typhoon.

The petitioner requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*. In accordance with the statutory criteria provided in Section 333 of Public Law 112−95 in reference to 49 U.S.C. § 44704, and in

consideration of the size, weight, speed, and limited operating area associated with the aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that the requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates,* and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

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

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

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

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, Ken Shelton Photography is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b), to the extent necessary to allow the petitioner to operate a UAS to perform aerial data collection. This exemption is subject to the conditions and limitations listed below.

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

Conditions and Limitations

In this grant of exemption, Ken Shelton Photography 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 Yuneec Q500 Typhoon when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

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

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

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

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

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

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

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

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

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

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

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

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

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

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be

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

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

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

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

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

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

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

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

22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification

(N−Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.

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

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

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

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

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

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

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

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

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

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

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

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

This exemption terminates on September 30, 2017, unless sooner superseded or rescinded.

Sincerely,

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

Enclosures

Petition for Exemption under Section 333

Petitioner:
Kenneth Shelton
Ken Shelton Photography
7546 Trillium Blvd.
Sarasota, FL 34241
201-310-3055
ken@kenshelton.com
www.kenshelton

Petitioner requests an Exemption under Section 333 to operate a Yuneec Q-500 Typhoon UAV for Commercial Aerial Photography and Surveys

1. UA referenced weighs 60 ounces (3.75 pounds) with battery and camera installed. It will be operated within line-of sight of the PIC (a licensed Commercial Pilot) in accordance with the manufacturer's operations manual and as not to create a hazard to users of the national airspace or the public or pose a threat to national security.
2. UA will be maintained and operated in accordance with manufacturer's Aircraft Operation Manual.
3. UA is controlled via 2.4Mhz radio frequency.
4. Pilot/Petitioner is:
   - Licensed Commercial Pilot; Single/multi/rotocraft/Instrument rated.
   - USAF Trained Air Intercept Controller
   - Member: Academy of Model Aeronautics
   - Member: Sarasota RC Club.
   - Personal vetting by TSA (TSA Pre-Check), US Customs (Global Entry) and other agencies.
5. UA will be used for Aerial Photography and surveys. Operations will be conducted within clearly defined operational borders using procedures to ensure public safety, including persons and property both in the air and on the ground.
6. UA will be used at altitudes under 200 feet AGL and at speeds under 29MPH, clear of clouds and any visual obstructions.
7. UA will be used in accordance with aircraft operations manual, away from potential hazards, property and persons.
8. UA will not be used in proximity of any airport.
9. UA will be operated within visual line-of-sight of the PIC.
10. Pre-Flight Safety Risk Assessments will be conducted in accordance with the manufacturer's Operations Manual.

Respectfully Submitted,

Ken Shelton

Ken Shelton

Appendix:

Aircraft Specifications

- **Q500 TYPHOON Aircraft** http://yuneec.com/products/AerialUAV/q500-typhoon

  - Flight Time Up to 25 Minutes
  - Height 240mm (9.45 in)
  - Width 420mm (16.54 in)
  - Diagonal Length Without Rotor Blades 565mm (22.2 in)
  - Propeller/Main Rotor Diameter 330mm (13.0 in)
  - Weight Without Battery and Payload 1130g (40.0 oz)
  - Battery 5400mAh 3S 11.1V LiPo (included)
  - Charger 3S 11.1V LiPo DC Balancing Smart Charger with AC Adapter (included)
  - Transmitter 10-channel 2.4GHz with 5.8GHz video downlink (included)
  - 3 Flight Modes Smart, Angle and Home Modes
  - Maximum Flying Height Default 400 Feet Above Ground Level (Adjustable via the Q500 GUI)
  - Maximum Rotational Velocity 65°/s
  - Maximum Bank Angle 35°
  - Maximum Climb Rate in Smart and Angle mode 3m/s
  - Maximum Descent Rate in Smart and Angle mode 2m/s
  - Takeoff Weight With Battery and CGO2-GB 1700g (60.0 oz)
  - Radio Control Frequency Band 2.4GHz

July 8, 2015

Brenda Robeson, Program Analyst
Airmen and Airspace Rules Division
U.S. Department of Transportation
800 Independence Ave. S.W. Washington, DC 20591

Addendum to Docket No. FAA -2015-0791

SUBJECT: Petition for Section 333 Exemption of the FAA Modernization and Reform Act of 2012

Dear Ms Robeson,

In response to your letter of June 9, 2015 the following amplification to my Section 333 Exemption request is respectfully submitted.

I, Kenneth Shelton, of 7546 Trillium Blvd. Sarasota, FL 34241, hereby petition the FAA for a Section 333 exemption from various sections of 49 USC of Federal Aviation Regulations.

I am the owner of Ken Shelton Photography, and will be the Pilot in Charge (PIC) of all aerial photography following approval of this request. I am a FAA licensed Commercial pilot (#2132360) and hold a valid Florida Drivers License.

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012, Public Law 112-95, I request certain exemptions in order to conduct aerial photography for the education of real estate professionals and real estate marketing purposes using a small unmanned aerial vehicle (UAV).

Sincerely,

Kenneth Shelton

Kenneth Shelton
Owner
Ken Shelton Photography

OVERVIEW:

I, Kenneth Shelton, of 7546 Trillium Blvd. Sarasota, FL 34241, hereby petition the FAA for a Section 333 exemption from various sections of 49 USC of Federal Aviation Regulations. I am the owner of Ken Shelton Photography, and will be the Pilot in Charge (PIC) of all aerial photography following approval of this request.

Pursuant to Section 333 of the Modernization and Reform Act of 2012, Public Law 112-95, I request certain exemptions in order to conduct aerial photography for the education of real estate professionals and real estate marketing purposes using a small UAV - the Yuneec Q500.

The Yuneec Q500 weighs less than five pounds to include the camera payload. This UAV operates, under normal conditions, at a top speed of no more than 20 knots; and has the capability to hover and move in a vertical and horizontal plane simultaneously.

The Yuneec Q500 consists of four DC motors with rotors that are powered by a Lithium battery managed by an onboard flight control system that is remotely accessed by the PIC using a portable control unit.

The Yuneec Q500 remote control unit is a wireless communication device using the 5.8GHz frequency band, which is approved by the FCC for limited-range communication purposes. I will manually operate the UAV only in Visual Line of Sight and will conduct flight missions that are within the operating parameters as described in the manufacturer's operating manual.

YUNEEC Q500 SPECIFICATIONS:

- Height: 210mm (8.3 in)
- Length (without rotor blades): 420mm (16.5 in)
- Width (without rotor blades): 420mm (16.5 in)
- Diameter (without rotor blades): 565mm (22.2 in)
- Propeller/Rotor Blade Diameter: 330mm (13.0 in)
- Weight (without battery and payload): 1130g (40.0 oz)
- Takeoff Weight (with battery and CGO2-GB): 1700g (60.0 oz)
- Battery: 5400mAh 3S 11.1V LiPo (included)
- Airspeed 16-20MPH

- Flight Time: 20-25 minutes

As a licensed pilot and professional photographer, I am extremely sensitive and aware of the importance of safety and privacy, especially as it relates to UAVs. I believe safety is the first and overriding priority in regards to operating a UAV.

Additionally, I will not operate at the UAV in a manner as to invade the privacy of anyone unaware of our flight intentions.

Our flight operations will occur during daytime hours only with the purpose to enhance real estate marketing showing views of properties currently unattainable by still or aviation photography. I will operate the UAV in a safe manner, using the following pre-flight checklist and operating procedures to determine that the aircraft is physically and electronically ready for safe flight and that permission from the property owner/representative/business owner is received.

Pre-flight Checklist (Yuneec Q500):

- If required, notify the appropriate FAA facility of our launch schedule and location.
- Survey the property for hazards such as trees, utility poles and other elements that might compromise the flight, then make a judgment as to whether to proceed.
- Check the weather for wind speed, cloud cover, and any forecast changes that might adversely affect flight safety and performance.
- Examine the aircraft - looking at connections and searching for cracks and/or loose parts.
- Determine that the electronic elements are performing correctly (receiving more than six GPS signals along with calibration of the magnetic compass).
- Determine that the barometric altimeter reflects approximately 0 feet AGL.
- Following takeoff, I will hover at an altitude of approximately 10 feet AGL to assure the Home Point is marked.
- I will exercise all controls to confirm their functionality - if one of the controls is not functioning, the flight will be terminated immediately.
- I will fly with a Visual Observer (VO) at my side who will provide a second set of eyes to assist in observing possible flight hazards and help assure the UAV remains in Visual Line of Sight (VLOS) of PIC.
- Since the purchase of the Yuneec Q500, all training and skill improvement flights have been with the same VO.
- I will not fly over or near dense automobile traffic or crowds.
- I will give right-of-way to any manned aircraft.
- I will stay clear of FAA controlled airspace at airports (generally a five nautical mile radius) as well as restricted and prohibited zones.
- I will stay clear of clouds and fog (500 feet vertically and 2,000 feet horizontally).

- I will perform a post-flight check of the UAV to determine its physical and electronic condition.

Operating Procedures:

- After receiving permission from the property owner/representative/business owner, I will notify all adjacent property owners/business owners of our intentions and anticipated time on site.
- I will not fly over neighboring properties unless permission is granted.
- I will keep individuals not involved in the flight at a safe distance (500 feet without barrier).
- I will post a sign stating: “Take Notice: Aerial Photography Under Way - Stay Clear”.
- Flights will be operated manually within visual line of sight (VLOS) of the PIC and aircrew (VO).
- Maximum total flight time for each operational flight will be 20 minutes. Flights will be terminated at 25 percent battery power reserve should that occur prior to the 20 minute limit.
- Flights will be operated at an altitude of no more than 400 feet AGL, though most operations will be conducted within 50 feet of the ground.
- Minimum two (2) man crew for each UAV operation will consist of the Pilot and VO.
- The UAV will not enter any MOA or Restricted Airspace, nor shall it violate any TFR as outlined by the FAA.
- A pre-flight briefing will be conducted in regards to the planned UAV operation prior to each day's flying. It will be mandatory that all personnel who will be performing duties as "flight crew" be present for this briefing.
- VO and PIC will at all times be able to communicate by voice.
- If the UAV loses communications with the PIC or loses its GPS signal, the UAV has the capability to return to a pre-determined location and land.

Altitude, distance from the PIC, airspeed, and battery state-of-charge are data viewable on the On-Screen-Display (OSD), which is equivalent to an aircraft’s control panel. I maintain that the above checklist and procedures will minimize risks to property and persons on the ground as well as other aircraft in the National Airspace.

As of this writing, I have practiced extensively with the Yuneec Q500, accumulating 70 hours of flight time. In addition, I am a FAA licensed pilot.

Exemption Requests:

14CFR
Part 21 Airworthiness Certification

Subpart H "prescribes the procedural requirements for issuing and changing design approval, production approval, airworthiness certificates and airworthiness approval." (Summation from Exemption No. 11138, page 11)

Response: "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,* and any associated noise certification and testing requirements of part *36,* is not necessary." (Summation from Exemption No. 11138, page 11)

Part 61 (a)(b) Parts, General Operating and Flight Rules

(a) Prescribes the requirements for issuing pilot licenses and the privileges and limitations associated with various ratings.

(b) Aeronautical experience means pilot time, flight simulator or flight training device for meeting the appropriate training and flight time requirements for an airman certificate.

Response: Organized or commercially available FAA-approved flight training has yet to be achieved by the UAV industry. While I have regularly used a flight simulator on my computer, those skills are generally not transferable to small UAV operation. My sources of training are: the flight instruction manuals from the UAV manufacturer; online videos from the manufacturer as well as videos from users; and most importantly, personal training in a secure location - an open area not subject to traffic and/or uninvolved individuals.

Those training flights, which have averaged 20 minutes each, include setup, physical and electronic safety checks; lift off followed by hovering at approximately 10 feet to confirm that the GPS system is functioning properly and has registered its Home Point; a prescribed flight plan to familiarize and then master the fight controls and camera; returning to the launch point and landing. I then conduct a post-flight inspection for any problems, log the location and flight time and then view the video. There are no FAA certified instructors or FAA certified study guides available at this time as the technology continues to develop. I respectfully request an exemption from this rule.

§91.103 (b)(2)
(b)(2) This section deals the pilot's preparations for flight, in particular runway lengths, takeoff and landing distance information.

Response: Since the Yuneec Q500 takes off and lands vertically like a helicopter, a Yuneec Q500 pilot would not need to know this information since there are no runways involved and the return from flight is the takeoff point. The FAA has determined that "relief is not necessary." (Summation from Exemption No. 11138, page 20)

§ **91.105**
Summary: This section deals with flight crew members at stations.

Response: Since there are no passengers, pilots or crew members, I respectfully request relief from this regulation.

§ **91.109**
Summary: This sections deals with flight instruction, simulated instrument flight and certain flight tests.

Response: None of these functions are applicable to small UAV flight and, as stated earlier, there are no FAA certified instructors or FAA certified study guides available at this time for small UAV operation. I respectfully request an exemption from this rule.

§ **91.119 (a) (b) (c)**
Summary: This section deals with minimum safe altitude stating that if the power fails anywhere, an aircraft should have an altitude sufficient so that an emergency landing can occur without hazard to persons or property (91.119 a).

It also sets minimum altitudes over congested areas and uncongested areas as well as has a paragraph on helicopters (91.119 b). It also sets minimum distance (500 feet) from any person, vessel, vehicle, or structure (91.119 c).

Response: None of the altitude requirements in this regulation should apply to a UAV since these aircraft are required to fly below those altitudes. Their weight, speed and GPS-controlled Return to Home feature mitigates incidents that could occur from loss of signal between the aircraft and PIC. A manned aircraft is much heavier and larger than a Yuneec Q500. If a Yuneec Q500 were to malfunction, it carries no humans, no explosive fuel and since it flies primarily over a single piece of private property, any damage would likely be minimal and confined to that area. As to keeping 500 feet from any person, vessel, vehicle or structure, the purpose of real estate aerial photography is to fly close to the subject structures with the permission of the owner/representative. I maintain that my nearly 70 hours flying experience with the Yuneec Q500 have provided me with sufficient skills to manage safely any approach under 500 feet. In addition, access to the property is strictly controlled (warning sign and the clearing of any person on the property not involved in the flight). I respectfully request an exemption from this rule.

§ **91.121**
Summary: This section details altimeter settings required to maintain the "cruising altitude or flight level of that aircraft." It requires that the "elevation of the departure airport" be set in the altimeter or the "current reported altimeter setting of a station along the route and within 100 miles of the aircraft".

Response: A small UAV cannot comply fully with this section's altitude requirements. The Yuneec Q500 is equipped with a barometric altimeter which automatically calculates the takeoff altitude (0 AGL) when the aircraft is warmed up - the launch point becomes the "elevation of the departure" point.

The altitude of the UAV is visible in the control monitor (a smart phone or OSD) by the PIC before launch and is consistently updated as the flight progresses. I respectfully request an exemption from this rule.

§ 91.151
Summary: This section deals with fuel requirements for VFR flights stating, among other things, that "no person may begin a flight in an airplane under VFR condition unless...there is enough fuel to fly to the first point of the intended landing and, "...fly after that for at least 40 minutes (day) and 45 minutes (night)".

Response: This regulation deals with 'reserve' fuel. This could include any condition that increases flight time or fuel consumption. Weather would be one factor including wind, turbulence and the necessity to divert around threatening thunderstorms. Compliance with this regulation is not possible because the 'fuel" onboard the Yuneec Q500 is not aviation gas but a Lithium battery with a maximum flight duration of 20 minutes. Fuel management of an UAV requires constant monitoring of the battery's state-of-charge and bringing it home before it reaches the manufacturers recommended 30 percent level.

In our training flights, we've found that a flight of 20 minutes to be safe, returning the UAV to its Home Point around the 40 percent battery capacity level. I respectfully request an exemption from this rule.

§ **91.405**
Summary: This section deals with aircraft maintenance including regular inspection, the keeping of appropriate maintenance records and replacement of inoperable instruments.

Response: Maintenance on the Yuneec Q500 is quite straight forward. If, in landing, a rotor blade or two are damaged, they are quickly replaced. The traditional instrument cluster in an aircraft is replaced by a data stream from the Yuneec Q500, visible in the control monitor (smart phone or OSD). Replacement of minor parts are performed by the PIC and a major 'overhaul' that can't be easily resolved will go back to the manufacturer for repair.

Currently, there are no required inspections by 'authorized' maintenance personnel and there would be no space/room on board to install a placard of inoperability. I respectfully request an exemption from this rule.

§ **91.407**
Summary/Response: This section addresses requirements after maintenance has been performed. Again, approval of the maintenance before flight is essentially in the hands of the PIC.

Whatever maintenance is performed will be entered in the aircraft log, unless a separate maintenance log is required. Paragraph (b) refers to the prohibition of a pilot carrying passengers or crew members, if the flight characteristics have been substantially affected, before a rated pilot performs an operational check of the maintenance. Again, this is a PIC's responsibility to preflight the Yuneec Q500 and determine its flyability. And, as mentioned earlier, there is no pilot, crew members or passengers on board the Yuneec Q500. I respectfully request an exemption from this rule.

§ **91.409**
Inspections: This section deals with the necessity of annual and 100-hour inspections or "progressive inspections" and approval by authorized persons which will lead to the "issuance of an airworthiness certificate."

Response: As stated earlier, there are no FAA-approved inspection protocols nor authorized inspection personnel. The PIC handles those issues each time the Yuneec Q500 is prepared for flight. The pre-flight check list enumerated earlier will be followed to determine its mechanical and electronic integrity. I respectfully request an exemption from this rule.

§ **91.417**
Maintenance Records: This section requires a maintenance record be kept on repair, replacement and condition of vital parts (rotors, engines & airframe). Certain records must be retained for one year while other record must be kept with the aircraft even when sold to another part.

Response: The details of this section would be impractical with a Yuneec Q500, but repair issues can be entered into the aircraft log. I respectfully request an exemption from this rule.

The above requests for exemptions follow the guidance published by the FAA.

Safety:

The Yuneec Q500 is a small four-rotor UAV with multiple safety features to assure a safe and efficient flight, minimizing personal injury and property damage and integrating with minimal risk into the NAS. They include:

- A GPS flight system that allows for stable remote control of the aircraft.

- The ability to hover in place by simply taking hands off the controls.
- A Return to Home function if electronic contact between the Remote Control and the aircraft is lost. If the aircraft begins to show unstable flight, I will land it immediately.
- The ability to limit height (<400 feet) and distance (<1000 feet) from the PIC through the control software.
- Use of the 'radar' mode which instantly allows the PIC to pinpoint the UAV.
- The No Fly Zone control software will prevent takeoffs within a five mile radius of a major airport as well as provide warning in the event that the aircraft inadvertently approaches the zone while in flight. This warning will provide sufficient time for the PIC to reverse course.
- Readout of the battery's state of charge so that there is sufficient power to bring the UAV home.

The weight, size, speed and limited flight of this small UAV focuses on inanimate objects (homes) reduces the likelihood of significant personal or property damage. Flight of the UAV risks no onboard lives unlike manned helicopters or planes used for aerial photography. The safety features associated with the Yuneec Q500 as well as my pre-flight checklist and procedures will assure that public safety is not adversely affected.

With regard to aerial videography and photography, Ken Shelton Photography adheres to all FAA regulations. Further, Ken Shelton Photography operates under the principals of: Safety First, Quality Assurance, Accountability, Reporting, and Training. When approved by the FAA, it is Ken Shelton Photography's mandate to treat all UAV operations with the same level of professionalism and seriousness as that of manned aircraft.

Approval of exemptions allowing commercial operations of small UAV in the real estate industry will enhance safety by reducing risk.

Conventional filming operations, using turbine or piston powered manned aircraft, present the risks associated with the vehicle weight and Jet A or 100 LL fuel. Such aircraft must fly to and from the site location. In contrast, a UAV weighing fewer than 10 pounds and powered by batteries eliminates virtually all of the risk given the substantial reduced mass and lack of combustible fuel carried on board. The UAV is typically transported to the location via an automobile in a protective case.

The operation of small UAV, weighting less than 10 pounds, conducted in the strict conditions outlined above, will provide an equivalent level of safety supporting the grant of the exemptions requested herein, including exempting the applicant from the requirements of Part 21 and allowing commercial operations.

The markets of interest for Ken Shelton Photography is the marketing of real property and the education of real estate professionals primarily in South West Florida.

Community Benefit:
First and foremost is the reduced risk public safety that a small UAV offers in comparison to a manned fixed wing or rotorcraft. Weighing five pounds with camera and battery, the Yuneec Q500 is incapable of causing the level of damage or injury caused by a full-size, manned aircraft. Additionally, the ecologic and noise impact is negligible as compared to traditional manned aircraft. Lastly, as real estate is a large part of our community, the use of a small UAV aerial filming platform is a cost-effective and visually impactful means to promote our available properties, therefore becoming an economic driver in the community. Ken Shelton Photography is eager to support the FAA and UAV community in its quest to establish proper regulations and protocols for the safe introduction of unmanned aircraft into the National Airspace.

Signed,

Kenneth Shelton

Kenneth Shelton, Owner
Ken Shelton Photography

Attachments:

- Yuneec Q500 Typhoon User Manual