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

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

July 14, 2015

Exemption No. 12027
Regulatory Docket No. FAA–2015–1381

Mr. Timothy A. Paris
Vice President of Operations
Mr. William M. Bogar, Esq.
Attorney/Superintendent
Alex E. Paris Contracting Company, Inc.
1595 Smith Township Road
Atlasburg, PA 15004-0369

Dear Messrs. Paris and Bogar:

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

By letter dated April 23, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Alex E. Paris Contracting Company, Inc. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial imaging for monitoring of construction sites.

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, Alex E. Paris Contracting Company, Inc. 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

[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.

aerial data collection. This exemption is subject to the conditions and limitations listed below.

Conditions and Limitations

In this grant of exemption, Alex E. Paris Contracting Company, Inc. 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 July 31, 2017 unless sooner superseded or rescinded.

Sincerely,

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

Enclosures

ALEX E. PARIS
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Our Greatest Assets
Our Employees

April 23, 2015

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

RE: Request for Exemption under Section 333 of the FAA Modernization and Reform Act of 2012 and Part 11 of the Federal Aviation Regulations from Certain Sections of 14 C.F.R.

Dear Sir or Madam,

Please review the enclosed application requesting exemption from the Federal Aviation Regulations listed above and contained within this document. If we can provide any additional information to assist in your review of this document, please do not hesitate to contact us at (724) 947-2235 or via email at either tparis@alexparis.com or wbogar@alexparis.com.

Thank you,

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April 23, 2015

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

Re: Request for Exemption under Section 333 of the FAA Modernization and Reform Act of 2012 and Part 11 of the Federal Aviation Regulations from Certain Sections of 14 C.F.R.

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the "Reform Act"), Alex E. Paris Contracting Company, a Pennsylvania Corporation (Petitioner) and planned operator of a Small Unmanned Aircraft System (sUAS) hereby applies for an exemption from the listed Federal Aviation Regulations (FAR's) to allow for commercial operation of its sUAS to provide aerial imaging for monitoring of secured and controlled construction sites, so long as these operations are conducted under the conditions outlined within this framework or as may be established by the FAA as required by Section 333. A summary of this request suitable for publication in the Federal Register is provided within Part VIII of this application.

The requested exemption would allow the Petitioner to safely, efficiently and economically use a commercial sUAS within the National Air System (NAS). As detailed in this document and the attached instruction manual (plus additional documentation) within the Appendix, the requested exemption would permit the Petitioner to operate the sUAS under controlled conditions in airspace that is limited and predetermined. In addition, access to the sites, themselves, will be tightly controlled. Accordingly, the approval of this exemption would enhance safety and fulfill the Secretary of Transportation's 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 (NAS)."

The name and address of the applicant are:

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The regulations from which the exemption is requested are as follows:

14 C.F.R. Part 21(h)
14 C.F.R. § 91.203(a) (1)
14 C.F.R. § 45.23(b)
14 C.F.R. § 45.27(a)
14 C.F.R. § 91.9(c)
14 C.F.R. § 61.113(a) & (b)
14 C.F.R. § 91.7(a)
14 C.F.R. § 91.9(b) (2)
14 C.F.R. § 91.203(a) & (b)
14 C.F.R. § 91.103
14 C.F.R. § 91.109(a)
14 C.F.R. § 91.119
14 C.F.R. § 91.121
14 C.F.R. § 91.151(a)
14 C.F.R. § 91.405(a)
14 C.F.R. § 91.407(a) (1)
14 C.F.R. § 409(a) (2)
14 C.F.R. § 417(a) & (b)

I. DESCRIPTION OF PETITIONER

Alex E. Paris Contracting Company, Inc. (AEP) is a Pennsylvania Corporation specializing in heavy construction and a variety of industrial services related to it. Operating primarily in Pennsylvania, Ohio and the Mid-Atlantic region, we engage in a variety of construction services, both public and private, which include underground utility installation, site development, building foundation construction, site demolition and remediation, environmental mitigation & reclamation as well as const. management. Having been in existence for 67 years, we are members in, and actively involved in the National Utility Contractor's Association, Pennsylvania Utility Contractor's Association, West Virginia Utility Contractor's Association, American General Contractors Association and the Associated Builders and Contractors Association.

II. RELEVANT STATUTORY AUTHORITY

This petition for exemption is submitted in accordance with Section 333(a) through (c) of the FAA Modernization and Reform Act of 2012. The "Reform Act" gives authority to the Secretary of Transportation to consider whether certain unmanned aircraft systems (UAS) may operate safely within the National Airspace System (NAS) before completion of the rulemaking required under Section 332 of the "Reform Act". The Secretary has delegated this aviation authority to the Administrator of the FAA. In making this determination, the Administrator must determine which types of UAS's 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 considerations, stated under Section 333(b):

- The size, weight, speed and operational capability of the UAS.
- Whether the UAS operates within the visual sight line of the operator.
- Whether the UAS operates within close proximity to airports and populated areas.

Accordingly, under Section 333(c), if the Administrator makes the determination that the UAS "may operate safely in the national airspace system (NAS), the Secretary shall establish requirements for the safe operation of such aircraft in the national airspace system (NAS).

In addition, under 49 U.S.C. § 44701(f) the Administrator is expressly given the authority to grant exemptions from its safety regulations and standards if the Administrator finds the exemption is in the public interest. (49 U.S.C. § 44701(f) permits exemptions from §§ 44701(a) & (b) and §§ 44702 through 44716). Furthermore, a party requesting such an exemption must explain the reasons why the exemption: (1). would be in the public interest or how it would benefit the public as a whole, and (2). that it would not adversely affect safety (or how it would provide a level of safety at least equal to the existing regulation from which exemption is sought) under 14 C.F.R. § 11.81.

The sUAS owned by Alex E. Paris Contracting Company, Inc. is a small multirotor vehicle and it weighs less than 5 pounds (apx. 60oz.) at lift-off. Under normal conditions, it operates at a speed of no more than 25 knots. It has the capability of hovering and moving within both a horizontal and vertical plane simultaneously. The sUAS will operate only in the visual line of sight of its pilot in command (PIC) and a visual observer (VO) that will be present during actual flight operations. The sUAS will only operate under controlled conditions, in airspace that is both predetermined and limited. In addition, ground-access to these sites will be tightly controlled. Finally, the sUAS will operate at an altitude of no more than 400 feet, posing no risk to users of the national airspace system. Accordingly, these operations insure that the sUAS will "not create a hazard to users of the national airspace system or to the public" as mandated within Section 333(b) of the Reform Act.

Given the small size of the sUAS involved and the restricted environment within which it will operate, this petition for exemption falls squarely within the "equivalent level of safety" under 14 C.F.R § 11.81 in which Congress intended that the FAA, by exemption, permit commercial operation of the sUAS to commence, pending completion of formal rulemaking. Furthermore, due to its small size plus the low altitudes and restricted areas in which it will operate, approval of this petition presents no national security issue.

Considering the clear direction in Section 333 of the Reform Act, the authority contained in the Federal Aviation Act as amended, the equivalent level of safety surrounding the proposed operations and the public benefit which it will incur, the grant of the requested exemptions are also in the public interest.

Accordingly, Alex E. Paris Contracting Company, Inc. respectfully requests the FAA to grant the requested exemption without delay.

III. PUBLIC INTEREST

This exemption application is expressly submitted to fulfill Congress' goal in passing Section 333(a) through (c) of the FAA Modernization and Reform Act of 2012 (the "Reform Act"). The law allows the Secretary of Transportation to consider whether certain small unmanned aircraft systems (sUAS) can operate safely within the national airspace system (NAS) before completion of the rulemaking that is required under Section 332 of the "Reform Act". By granting an exemption, the FAA will fulfill Congress' intent of allowing a sUAS to operate with significant safety precautions in a restricted, low risk environment.

The use of a sUAS on a construction site will significantly reduce the risk to our employees/workers with respect to slips and falls while inspecting, surveying and monitoring site progress. A sUAS is

capable of photographing and collecting data from many areas that normally require employee inspection, thus eliminating many of the risks associated with it. Accordingly, since slips and falls are a major source of construction site injuries and fatalities, the effect of reducing their probability through the use of a sUAS would squarely be within the public interest.

In addition, the use of a sUAS on a construction site will allow for a more thorough site review, potentially revealing issues and concerns that might not be evident from an on-ground, visual inspection. Generally, the projects that we undertake are subject to stringent environmental controls. The primary objective of these controls is to regulate (or even eliminate) the discharge of potential pollutants from the site into the surrounding environment. Often the failure of these controls to do so may subject the contractor to substantial fines from the Environmental Protection Agency (EPA) or a similar state authority or both. As a contractor, we take both the construction and maintenance of environmental controls very seriously, conducting visual inspections on a daily basis. In addition to the risks posed by slips and falls, visual inspections can only provide a limited, view of the effectiveness of these controls. The use of a sUAS will provide a birds-eye, view of the controls. Any potential breaches will readily be evident as will be the extent of the discharge and potential damage done to the surrounding environment. The collection of such data will allow for faster, more focused and efficient repair and maintenance times. This too, is squarely within the public interest since a more sustainable and cleaner eco-system is beneficial to everyone.

The sUAS can provide for quick and cost effective aerial monitoring of all or a significant portion of a construction site-something that is not possible without this technology. The sUAS can be used to monitor site progress on a daily basis, allowing site crews and project managers to examine and inspect completed work for flaws, more quickly. Similarly, aerial monitoring will allow for a more efficient allocation of equipment and manpower-as it will allow site crews and project managers to better identify areas of the project that require additional resources. These considerations are within the public interest because they enhance the ability to produce a safer product and work to assure both the cost-effectiveness and safety of the work performed.

The sUAS that we propose to fly for operations under this application weighs less than 5 pounds (apx. 60oz) and carries no on-board pilot, passengers or cargo. It also carries no combustible fuels or other flammable material-unlike larger conventional aircraft that could be used to provide the same services. Utilizing a sUAS, instead of a larger conventional aircraft, provides for a much greater degree of safety for both our employees and the general public. Lastly, it should also be noted that our sUAS will be powered by rechargeable lithium ion batteries-as opposed to the burning of fossil fuels. Hence, the environmental impact of utilizing the sUAS for aerial imaging is greatly reduced-especially when contrasted with the use of a larger conventional aircraft to provide the same thing.

IV. DESCRIPTION OF OPERATIONS

The grant of exemption to Alex E. Paris Contracting Company, Inc. for the Yuneec Q500 Typhoon sUAS will be subject to the following operating conditions. The main restrictions have been summarized below.

1. Operations will be conducted over private, controlled-access, or public property where approved.

2. Written and/or verbal permission from the land-owner/authority will be required before the commencement of any flight.

3. All operations conducted within 5 miles from an airport shall only be initiated after verbal coordination with the airport authority, or air traffic control when a control tower is present at the airport.

4. All onsite personnel will consent to the sUAS flyover on site by written waiver and the pilot in command (PIC) will obtain additional written or verbal consent of anyone who is allowed within 100 feet of the flight operation.

5. 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.

6. A briefing will be conducted with regard to the planned sUAS operation prior to the start of each day's operations. This briefing will be mandatory for all personnel who are performing duties within the boundaries of the secured area of which the sUAS will be operating.

7. The Yuneec Typhoon Q500 (sUAS) weighs less than 5 pounds (apx. 60oz.).

8. All flights will be operated within the visual line of sight of both the pilot in command (PIC) and an additional visual observer (VO).

9. Maximum total flight time for each operational flight will be limited to the amount of time that the second low battery warning indicator on the hand-held flight control box is achieved. This generally allows for a flight time of 20-25 minutes, as per manufacturer's specifications.

10. All flights will be operated at an altitude of no more than 400 feet above ground level (AGL) and will operate in the secured area within a confined geo-fence, defined by a maximum 300 foot radius.

11. The minimum crew for each operation will consist of a pilot in command (PIC) and a visual observer (VO).

12. The pilot in command (PIC) will be an FAA licensed airman with a private pilot's certificate (or a sUAS certificate, once the FAA establishes the criteria and procedures for obtaining a sUAS license) and a second class medical certificate.

13. The sUAS will operate in accordance with all safety and operational requirements contained within the instruction manual attached in the Appendix to this application.

14. Both the pilot in command (PIC) and visual observer (VO) will be trained in operation of the Yuneec Q500 Typhoon and will have received up-to-date maintenance information regarding the sUAS.

15. The pilot in command (PIC) will conduct a pre-flight inspection, prior to each flight and determine that the sUAS is in a condition safe for flight. If the inspection reveals a condition that affects the safe operation of the sUAS, the aircraft will be prohibited from operating until the necessary maintenance is performed and the sUAS is made safe for flight. All maintenance performed on the sUAS will be denoted in a Maintenance Log kept specifically for the sUAS.

16. The pilot in command (PIC) and visual observer (VO) will be able to communicate by voice at all times.

17. The pilot in command (PIC) will be trained in advance for the safe operation of the sUAS to be

operated. This will include operation of the sUAS both in normal and in emergency modes of operation, and will include familiarization with the instruction manual published by the sUAS manufacturer and attached in the Appendix to this application. Training will also include types of maneuvers to be performed and the safe operation in relation to persons, property and applicable airspace.

18. Contingency plans will be in place to safely terminate flight if there is a loss of communication between the pilot in command (PIC) and visual observer (VO).

19. Operations will only be conducted during daylight hours.

V. REGULATIONS FROM WHICH EXEMPTION IS REQUESTED

Alex E. Paris Contracting Company, Inc. ("Petitioner") requests an exemption from the following regulations as well as any additional regulations that may technically apply to the operation of sUAS's:

14 C.F.R. Part 21(h): Airworthiness Certificates.
14 C.F.R. § 91.203(a) (1)

14 C.F.R. § 91.203(a) (1) requires that no person may operate a civil aircraft unless it has within it a certificate of airworthiness. 14 C.F.R. Part 21(h) establishes the procedural requirements for the issuance of airworthiness certificates as required by 14 C.F.R. § 91.203(a) (1). The Federal Aviation Act and Section 333 gives the FAA authorization to exempt aircraft from the requirement for an airworthiness certificate upon consideration of certain characteristics. These characteristics include the size, weight, speed, operational capability, and proximity to airports and populated areas of the particular UAS. Given the size of the aircraft, that we intend to operate (less than 5 lbs.) and the limited operating area associated with these operations, an exemption from 14 C.F.R. Part 21(h) meets the requirements of an equivalent level of safety under Part 11 and Section 333 of the Reform Act.

Equivalent Level of Safety

In this case, a further examination of these criteria demonstrate that the sUAS operated without an airworthiness certificate, under the conditions proposed herein, will be at least as safe, or safer, than a conventional aircraft (either fixed wing or rotorcraft) with an airworthiness certificate. The sUAS operated by Alex E. Paris Contracting Company, Inc. has a gross take-off weight of less than 5 pounds (apx. 60 oz.). It will not carry a pilot or a passenger. It will not carry explosive materials or flammable liquid fuels. It will operate exclusively in a secured area with receipt of permission from the landowner and consent obtained from all ground personnel, prior to flight. Unlike other civil aircraft, all proposed operations of the sUAS will be tightly controlled and monitored by its pilot in command (PIC) and an additional visual observer (VO). Furthermore, the aircraft will be carried to the area of operation, not flown.

Taken together, these safety enhancements provide a greater degree of safety to the Petitioner's employees, members of the public and property owners than conventional operations of civil aircraft that require an airworthiness certificate under 14 C.F.R. Part 21(h). Such aircraft are considerably larger, carry passengers and cargo as well as flammable fuel and operate without the restrictions and conditions being proposed for our sUAS. In addition, application of these same criteria clearly demonstrate that the proposed operation of our sUAS poses no credible threat to national security due to its size, speed of operation, lack of explosive materials or flammable liquid fuels and inability to

carry a substantial external load. *The FAA has issued several exemptions to 14 C.F.R. Part 21(h) a sampling includes the following exemptions: 11062, 11080, 11109, 11153, and 11174. The FAA has issued several exemptions to 14 C.F.R. § 91.203(a) (1), a sampling includes the following exemptions: 11062, 11080, 11109, 11153, and 11174.*

14 C.F.R. § 45.23: Marking of the Aircraft.
14 C.F.R. § 91.9(c)
14 C.F.R. § 45.27(a)

Applicant seeks an exemption from the aircraft marking and identification requirements contained in 14 C.F.R. § 45.23, 14 C.F.R. § 91.9(c) and 14 C.F.R. § 45.27(a).

- 14 C.F.R. § 45.23, Markings of the Aircraft, states:

  (a). Each operator of an aircraft must display on that aircraft marks consisting of the Roman capital letter "N" (denoting United States registration) followed by the registration number of the Aircraft. Each suffix letter used in the marks displayed must also be a Roman capital letter.

  (b). 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 the 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.

- 14 C.F.R. § 91.9(c), Civil Aircraft Flight Manual, Marking & Placard requirements, provides that:

  No person may operate a US-registered civil aircraft unless that aircraft is identified in Accordance with Part 45 of this chapter.

- 14 C.F.R. § 45.27(a), Rotorcraft, states:

  Each operator of a rotorcraft must display on that rotorcraft horizontally on both surfaces of the Cabin, fuselage, boom, or tail the marks required by § 45.23(b).

Exemption from 14 C.F.R. § 45.23(b) is warranted because the sUAS has no entrance to the cabin, cockpit or pilot station on which the markings can be placed. Given the size of the sUAS, 2 inch lettering will be impossible, as well.

Equivalent Level of Safety

Official marking systems for sUAS have yet to be established for operations inside the NAS. Petitioner is prepared to mark the sUAS with its name, location and origin. Petitioner will also fulfill any other request made by the FAA on this topic in accordance with 14 C.F.R. § 45.29(f) where the pilot, observer and any others working with the sUAS will see the identification of the sUAS.

The FAA has issued several exemptions to 14 C.F.R. § 45.23(b), a sampling includes the following exemptions: 8738, 10167, 10167A and 101700.

The FAA has issued several exemptions to 14 C.F.R. § 91.9(c), a sampling includes the following exemptions: 11136, 11170, 11171, 11174, and 11185.

14 C.F.R. § 61.113(a) & (b): Pilot in Command (P.I.C.)

Petitioner seeks an exemption from the private pilot privileges and limitations, outlined in 14 C.F.R. § 61.113(a) & (b). Accordingly, these regulations state:

- (a). Except as provided in paragraphs (b) through (h) of this section, no person who holds a private pilot certificate may act as a 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.

Accordingly, under paragraphs (b) through (h) of this section, no person who holds a private pilot certificate may act as pilot in command (PIC) of an aircraft which is carrying passengers or property for compensation or for hire; Similarly, nor may that person, for compensation or hire, act as pilot in command (PIC) of an aircraft. However, a private pilot may, for compensation or hire, act as pilot in command (PIC) of an aircraft in connection with any business or employment in certain circumstances-specifically, if that flight is only incidental to that business or employment and the aircraft does not carry passengers or property for compensation or for hire.

Equivalent Level of Safety

Because the sUAS will not carry a pilot or passengers, the proposed operation can achieve the equivalent level of safety contemplated under these regulations by requiring the pilot in command (PIC) operating the aircraft to have a private pilot's license rather than a commercial pilot's license. Firstly, any flight conducted with the sUAS will only be incidental to that business or employment. Secondly, unlike a conventional aircraft carrying a pilot and living passengers, the sUAS is remotely controlled with no living thing or any cargo onboard. Additionally, the Yuneec Q500 Typhoon is equipped with numerous safety features that greatly reduce the risk of human error, contemplated by this regulation.

- At start-up and prior to flight, the sUAS undergoes a self-initialization process. Flight is not possible unless this initialization process is successful.

- The maximum altitude of the sUAS is limited to 400 feet and it has the capability to create a geo/virtual fence, restricting its horizontal movement. This will allow the pilot in command to create a pre-planned flight area-beyond from which the sUAS can't operate.

- Battery strength is displayed on the hand-held, control box allowing for continuous monitoring by the pilot in command (PIC). In addition, the control box is equipped with low-level battery warning lights and is designed to vibrate and/or send an audible alert as the flight battery becomes diminished, thus warning the pilot in command (PIC) to land the sUAS.

- The sUAS is equipped with a "Home Mode" function. Once activated, the sUAS will land automatically within 13-26 feet of the pilot in command (PIC).

Furthermore, the sUAS will only be operated within a secure and controlled area. Receipt of permission from the landowner will always be obtained prior to flight. In addition, any potential persons within this restricted area will not be exposed to these operations without their pre-obtained consent. Finally, we propose that a visual observer (VO) be utilized for each flight and be in verbal communication with the pilot in command (PIC) during its duration.

Taken together, the sUAS to be operated hereunder weighs less than 5 pounds (apx. 60oz.) at lift-off. It carries no pilot or passengers. It carries no explosive materials, flammable fuels or other liquids. It will operate, exclusively, within a secured and restricted area. It is equipped with a number of features that greatly minimize the risks posed by human error and an additional party will be present to visually monitor the flight in addition to the pilot in command (PIC). For these reasons, the Petitioner believes that the risks associated with the operation of the sUAS are so diminished from the level of risk associated with commercial operations contemplated by Part 61, that allowing operations of the sUAS as requested with a private pilot as the pilot in command (PIC) exceeds the present level of safety as contemplated by 14 C.F.R. § 61.113 (a) & (b).

The FAA has issued several exemptions to 14 C.F.R. § 61.113, a sampling includes the following exemptions: 11062, 11063 11109, 11215, 11227, 11229, 11239, 11241, 11258, 11283, 11286, 11335.

14 C.F.R. § 91.7(a): Civil Aircraft airworthiness.

Petitioner seeks an exemption from 14 C.F.R. § 91.7(a). This regulation requires that a civil aircraft be in an airworthy condition in order to be operated. In the event that the exemption be granted allowing commercial operation of sUAS without an airworthiness certificate, no FAA regulatory standard will exist for determining airworthiness.

Equivalent Level of Safety

Petitioner proposes to operate a sUAS with a lift-off, gross weight of less than 5 pounds (apx. 60oz.) and it will not be flown unless it has been maintained and prepared in accordance with all specifications and requirements identified by the manufacturer. An equivalent level of safety will be achieved by ensuring compliance with the sUAS instruction manual and quick start guide, attached in the Appendix to this application.

The FAA has issued several exemptions to 14 C.F.R. § 91.7(a), a sampling includes the following exemptions: 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11136, 11138, 11150, 11153, 11156, 11157, 11158 11160, 11161, 11166, 11167, 11170, 11171, 11172, 11174, 11177, 11178, 11184, 11185, 11188, 11189, 11191, 11192, 11193, 11195, 111204, 11215, 11227, 11229, 11335 .

14 C.F.R. § 91.9(b) (2): Civil Aircraft Flight Manual in the Aircraft.

- Pursuant to 14 C.F.R. § 91.9(b) (2):

  (b). 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.

Petitioner's sUAS has a take-off, gross weight of less than 5 pounds (apx. 60oz.). Given the size of the sUAS, it has no ability to place or carry such a flight manual onboard the aircraft. Furthermore, there will be no pilot on board and no room or capacity to carry this item onboard the aircraft.

Equivalent Level of Safety

An equivalent level of safety will be achieved by keeping the sUAS instruction manual at the ground control point where the pilot in command (PIC) flying the sUAS will have immediate access to it. *The FAA has issued several exemptions to 14 C.F.R. § 91.9(b)(2), a sampling includes the following exemptions: 8607, 8737, 8738, 9299, 9299A, 9565, 9565B, 1016710167A, 10602, 10700, 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11111, 11112, 11114, 11136, 11138, 11150, 11153, 11156, 11157, 11062, 11063, 11080, 11109, 11153, 11174.*

14 C.F.R. § 91.203(a) and (b): Carrying Civil Aircraft Certification and Registration.

- Pursuant to 14 C.F.R. § 91.203(a) and (b):

  (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 § 91.714 is Displayed at the cabin or cockpit entrance so that it is legible.

Petitioner's sUAS has a take-off, gross weight of less than 5 pounds (apx. 60oz.). Given its size, the sUAS has no ability to carry certification and/or registration documents, nor is there a place to display them. Furthermore, there is no pilot onboard, nor are there passengers or a crew.

Equivalent Level of Safety

An equivalent level of safety will be achieved by keeping these documents at the ground control point where the pilot in command (PIC) flying the sUAS will have immediate access to them. *The FAA has issued several exemptions to 14 C.F.R. § 91.203 (a) & (b), a sampling includes the following exemptions: 9565, 9665, 9789, 9789A, 9797, 9797A, 9816A, 10700, 11062, 11080, 11109, 11153, 11174.*

14 C.F.R § 91.103: Preflight Action.

This regulation requires each pilot in command (PIC) to become familiar with specific information before each flight, including information contained in the FAA-approved flight manual on board the aircraft. As FAA approved rotorcraft flight manuals will not be provided for the aircraft an exemption will be needed.

Equivalent Level of Safety

An equivalent level of safety will be provided as set forth on pages 4-5 and 20-27 of the instruction manual as well as the quick start guide (both are attached within the Appendix to this application). The pilot in command (PIC) will take all required preflight actions-including reviewing weather, flight battery requirements, landing and takeoff distances and aircraft performance data before initiation of flight. Furthermore, the sUAS instruction manual will be kept at the ground control point where the pilot flying the sUAS will have immediate access to it.

14 C.F.R. § 91.109: Flight Instruction.

Petitioner seeks an exemption from 14 C.F.R. § 91.109(a), this regulation 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 functional dual controls." sUAS and remotely piloted aircraft, by their design do not have fully functional dual controls. Flight control is accomplished through the use of a hand-held, control box that communicates with the aircraft via radio communications.

Equivalent Level of Safety

Given the size and speed of the Yuneec Q500 Typhoon sUAS, an equivalent level of safe training can be performed without dual controls because no pilot or passengers are aboard the Yuneec Q500 Typhoon sUAS. In addition, the system is equipped with an automatic "Home Mode" that can be activated at any time in response to unusual and unforeseen circumstances. Furthermore, all persons will remain a safe distance away should the sUAS experience any difficulties during flight instruction. Finally, the aircraft's light weight and slow speeds with no pilot or passengers on board will create less of a danger to the public than a conventional aircraft equipped with dual controls. *The FAA has issued exemptions for flight training without fully functional dual controls for a number of aircraft and also for flight instruction in experimental aircraft. Exemptions include: 5778K, 9862A, 11062.*

14 C.F.R. § 91.119: Minimum Safe Altitude.

Petitioner seeks an exemption from the minimum safe altitude requirements of 14 C.F.R. § 91.119. Specifically, § 91.119(c) limits aircraft flying over areas other than congested areas to 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. In addition, section 91.119(d) will allow 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." Because aerial monitoring and inspection work must be conducted at relatively low altitudes and sometimes at altitudes less than 500 feet, an exemption from 14 C.F.R. § 91.119(c) is requested.

Equivalent Level of Safety

In comparison to flight operations conducted with rotorcraft weighing far more than the Yuneec Q500 Typhoon sUAS and given the lack of flammable fuel, any risk associated with these operations is far less than those that are presently allowed with conventional aircraft. An equivalent level of safety will be achieved given the size, weight, speed, and material of which the sUAS is constructed as well as the location where it will be operated. As described in the instruction manual, the Yuneec Q500 Typhoon sUAS will always be operated within a "geo-fenced", restricted area and no flight will take place without the permission of the landowner or those who control the land. Additionally, any potential buildings and people within this restricted area will not be exposed to these operations without their pre-obtained consent. Furthermore, by operating at a lower altitude, the sUAS will effectively maintain separation with the operations of conventional aircraft that must comply with 14 C.F.R. § 91.119. *The FAA has issued to several exemptions to 14 C.F.R. § 91.119(c,) a sampling includes the following: 11162, 11163, 11164, 11165, 11166, 111080, 11109, 11110, 11111, 11112, 11114, 11136, 11138, 11150, 11153, 11174, 11215, 11227, 11229, 11239, 11258 and 11335.*

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

Petitioner seeks an exemption from 14 C.F.R. § 91.121, which requires the person operating an aircraft to maintain cruising altitude or flight level by reference to an altimeter that is set to the elevation of the departure airport or barometric pressure. An exemption is sought because the Yuneec Q500 Typhoon sUAS does not have a barometric altimeter, but rather a GPS altitude read-out.

Equivalent Level of Safety

An equivalent level of safety will be achieved by following the procedures set forth in the sUAS instruction manual. The pilot in command (PIC) will be able to confirm the altitude of the launch site, as it will be shown on the GPS altitude indicator (located on the hand-held, flight control box) before the flight takes place. Furthermore, the Yuneec Q500 Typhoon sUAS is pre-programmed for a maximum altitude limited to 400 feet AGL. In addition, the pilot in command (PIC) will be able to continuously monitor the altitude of the sUAS throughout the flight, as it is displayed on the hand-held, flight control box. Thus ensuring that the sUAS will only be operated at a safe altitude.

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

Petitioner seeks an exemption from 14 C.F.R. § 91.151(a)'s fuel requirements for flight in VFR (Visual Flight Rule) conditions. Accordingly, § 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 30 minutes: or

  (2) At night, to fly after that for at least 45 minutes.

The battery powering the Yuneec Q500 Typhoon sUAS provides for approximately 20-25 minutes of powered flight. Because of this, it is impossible to meet the 30 minute reserve requirement set forth in 14 C.F.R. § 91.151(a). However, given the limitations on the sUAS's proposed flight area(s), the location of its operation within a predetermined area and the construction of the sUAS, an exemption from 14 C.F.R. § 91.151(a) is required.

Equivalent Level of Safety

Petitioner believes that an exemption from 14 C.F.R. § 91.151(a) is warranted. Operating the Yuneec Q500 Typhoon sUAS, without 30 minutes of reserve fuel does not engender the type of risks that § 91.151(a) was intended to prevent given the size (less than 5 lbs.), speed (top speed apx. 25 knots) and light-weight materials of which the sUAS is constructed. Furthermore, the fact that it carries no pilot, passengers or cargo also enhances its safety. Operation will be limited to a controlled area where only people that have signed waivers will be permitted. The pilot in command (PIC) of the sUAS will able to continuously monitor the strength of the battery, as it is always displayed on the hand-held, flight control box. Once the battery strength is indicated as "low" on the flight control box, the pilot in command (PIC) will simply land the sUAS. As an additional safeguard, the "Home Mode" function of the sUAS can be programmed to operate in conjunction with low battery strength, so the sUAS can be programmed to automatically "land" once a predetermined amount of battery strength has been utilized. *The FAA has issued similar exemptions to 14 C.F.R. § 91.151(a) including exemption nos. 2689F, 5745, 10673 and 10808.*

14 C.F.R. § 91.405(a), 407(a) (1), 409(a) 2, 417(a) & (b): Maintenance Inspections.

14 C.F.R § 91.405(a) requires 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..." § 91.407(a) (1) also makes reference to requirements in Part 43. § 91.409(a) (2) requires an annual inspection for the issuance of an airworthiness certificate. § 91.417(a) requires the aircraft owner or operator to keep records showing certain maintenance work that has been accomplished by certificated mechanics, under Part 43 or licensed pilots and records of approval of the aircraft to return to service. An exemption to these regulations is needed because Part 43 and these sections apply only to aircraft with an airworthiness certificate, which the sUAS will not have.

Equivalent Level of Safety

An equivalent level of safety will be achieved because the sUAS is nearly maintenance free. The sUAS will perform several automatic preflight checks, prior to take-off and a failure of any one of them will act to prevent flight. Visual pre-flight checks that cannot be performed by the system will also be performed prior to each flight. These pre-flight checks will include an inspection of the airframe, an inspection of the rotors and the inspection of all batteries (flight battery, control box battery). In the event that maintenance is required, it will be performed and noted in a maintenance log-specific to the sUAS, which will be kept. Both pre-flight checks and maintenance will be performed by the pilot in command (PIC) as this is the person most familiar with the aircraft and is best suited to maintain it in an airworthy condition. Furthermore, in the event that unforeseen mechanical issues arise, the sUAS can land immediately in its predetermined area of operation. It's small size, lack of pilot, passengers and significant cargo plus the fact that flight operations will only take place in restricted areas for a limited period of time, create less risk than the same factors associated with conventional fixed-wing aircraft and rotorcraft performing the same operation.

VI. DRUG AND ALCOHOL PROGRAM

Alex E. Paris Contracting Company, Inc. is committed to maintaining a safe, healthy and efficient workplace for the benefit of its employees, clients and the general public. Our Drug and Alcohol Abuse Prevention Policy has been developed to meet the requirements of the Drug-Free Workplace Act, Regulations of the US Department of Transportation (DOT) and the mandatory guidelines of the U.S. Department of Health and Human Services, (DHHS).

VII. PRIVACY

All flights will occur in accordance with any state or local laws regarding privacy.

VIII. FEDRAL REGISTER SUMMARY

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:

Alex E. Paris Contracting Company, Inc. seeks an exemption from the following rules:

14 C.F.R. Part 21, Subpart H; 14 C.F.R. § 91.203(a)(1); 14 C.F.R. § 45.23; 14 C.F.R. § 45.27(a), 14 C.F.R. § 61.113(a) & (b); 14 C.F.R. § 91.9(c); 14 C.F.R. § 91.9(b)(2); 14 C.F.R. § 203(a) & (b); 14 C.F.R. § 91.7(a); 14 C.F.R. § 91.103; 14 C.F.R § 91.109(a); 14 C.F.R § 91.119; 14 C.F.R § 91.121; 14

C.F.R. § 121; 14 C.F.R. § 91.151(a); 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).

Approval of these exemptions allowing commercial operations of sUAS within the construction industry will enhance safety by reducing risk to the general public, property owners and on-site (construction), personnel. Manned aircraft monitoring and surveying creates a greater risk because the craft are much larger, carry on-board pilots, passengers and cargo and are also powered by combustible fuels. Similar monitoring and surveying conducted by on-site, personnel on the ground creates a greater risk due to the possibility of slips and falls. The operation of a small sUAS, weighing less than 5 pounds and powered by rechargeable lithium ion batteries will virtually eliminate the risk associated with a craft of larger mass powered by combustible fuels. Likewise, since the sUAS carries no pilot or passengers, these individuals will not be exposed to the risks associated with manned flights. Finally, the ability of the sUAS to monitor areas, difficult to access "on-foot" will reduce the risk of employee injuries due to slips & falls.

All operations of this small sUAS will be conducted according to the strict conditions outlined within this petition. Accordingly, this will provide a level of safety equivalent to that envisioned by Congress when these regulations were originally enacted. In general, sUAS operations will be conducted only during daylight hours in predetermined and restricted areas. Property owners and onsite, personnel will have received advance notice of these operations and will have consented to them beforehand. The sUAS being operated weighs less than 5 pounds, will be flown no higher than 400 feet and will travel at slow speeds of no more than 25 knots. Accordingly, the risk to the property owners, on-site personnel and the general public is greatly reduced and the risk of interference with other aircraft is minimal.

IX. CONCLUSION

Satisfaction of the criteria provided in Section 33 of the Reform Act of 2012-size, weight, speed, operating capabilities, proximity to airports and populated areas, operation within a visual line of sight and national security-provide more than adequate justification for the grant of the requested exemptions allowing commercial operation of petitioner's sUAS in the construction industry.

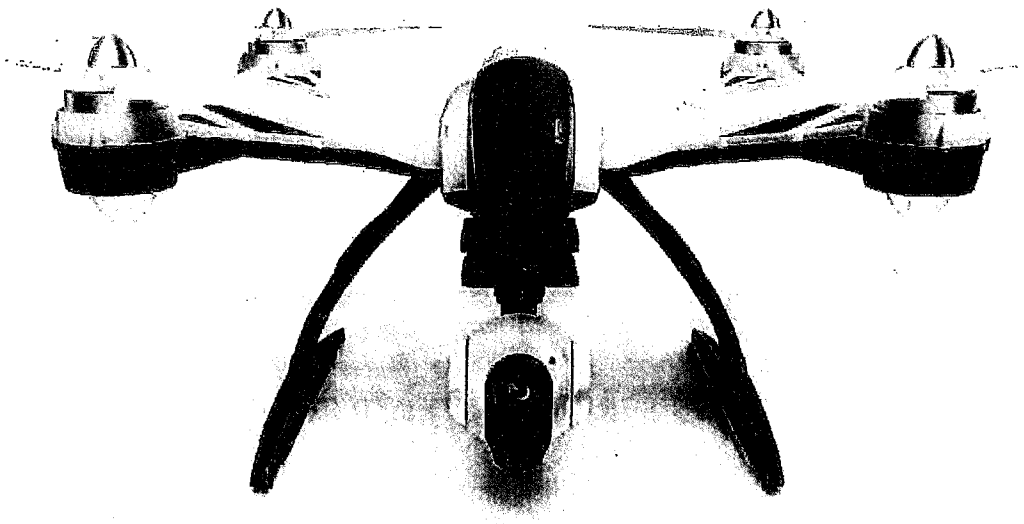
If you have any questions or require any additional information, please do not hesitate to contact either of the following parties.

Respectfully Submitted,

Timothy A. Paris
Vice President of Operations
Alex E. Paris Contracting Company, Inc.

William M. Bogar, Esq.
Attorney/Superintendent
Alex E. Paris Contracting Company, Inc.

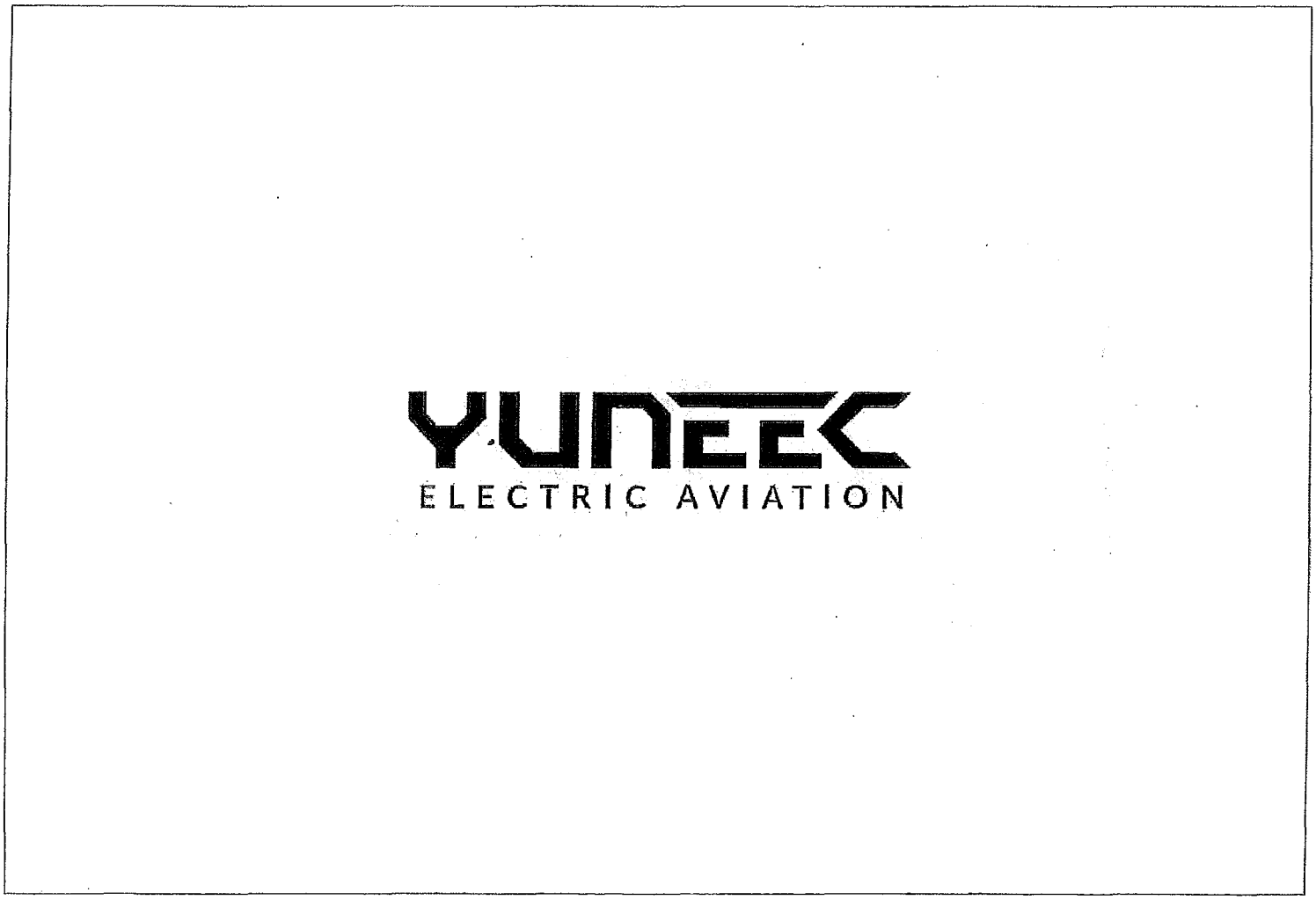
APPENDIX



Q500 TYPHOON

INSTRUCTION MANUAL

Version 2.1


YUNEEC
ELECTRIC AVIATION

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INTRODUCTION

Change your perspective with the Yuneec Q500 Typhoon aerial photography and videography (APV) system. The system arrives 100% factory-assembled and test flown including the innovative 3-axis CGO2-GB that records full HD 1080p (60, 50 or 48 fps) video and takes 12 megapixel still photos. And the built-in digital video downlink delivers streaming video that can be viewed right on the screen of the included ST10 transmitter and Personal Ground Station. With the Q500 it's never been easier to capture amazing photographs and video footage for a wide variety of uses.

And although the Q500 is nearly ready to fly right out the box, please take the time to read through this entire instruction manual for more information on safety, battery charging, flight controls and more before making your first flight. Please also visit www.Yuneec.com for additional information including product updates, bulletins, videos and more.

SPECIFICTATIONS

Q500

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)
Charger: DC 3S 11.1V LiPo balancing and AC adapter (included)
Transmitter: ST10 10-channel 2.4GHz with 5.8GHz video link (included)
Flight Time: 20-25 minutes

CGO2-GB

Height: 115mm (4.5 in)
Width: 75mm (2.9 in)
Depth: 135mm (1.4 in)
Weight: 185g (6.5 oz)
Video Resolution: 1080p 60, 50 or 48 fps
Photo Resolution: 12 megapixels
Transmission Distance/Range: Up to 600m (1970 ft) depending on receiving device
Transmission Band: 5.8GHz
Storage (memory): microSD Class 10 up to 128GB

ST10

Number of Channels: 10
RC Band: 2.4GHz
RC Modulation: Yuneec
Video Downlink Band: 5.8GHz
Telemetry/OSD: Yes
SD Card Compatible: Yes
LCD Screen Size: 4.5"
Touchscreen: Yes

NOTICES AND WARNINGS

IMPORTANT NOTE: All safety precautions and warnings, instructions, warranties and other collateral information is subject to change at the sole discretion of Yuneec. For the most up-to-date information please visit the corresponding product page at www.Yuneec.com or contact the nearest Yuneec office or authorized distributor.

The following special language terms are used throughout the product literature to indicate various levels of potential harm when operating this product:

NOTICE: Procedures, which if not properly followed, create a possibility of property damage and/or little to no possibility of injury.
CAUTION: Procedures, which if not properly followed, create the probability of property damage and/or a possibility of serious injury.
WARNING: Procedures, which if not properly followed, create the probability of property damage, collateral damage and/or serious injury or create a high probability of superficial injury.

WARNING: Read the ENTIRE quick start guide and instruction manual to become familiar with the features of the product before operating. Failure to operate the product correctly can result in damage to the product, property and/or cause serious injury.

WARNING: This is a sophisticated consumer product. It must be operated with caution and common sense, and requires some basic mechanical ability. Failure to operate this product in a safe and responsible manner could result in damage to the product, property and/or cause serious injury. This product is not intended for use by children without direct adult supervision. Do not use with incompatible components or alter this product in any way outside of the instructions provided by Yuneec. The quick start guide and instruction manual contain instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings prior to assembly, setup and/or use in order to operate the product correctly and avoid damage or serious injury.

AGE RECOMMENDATION: NOT FOR CHILDREN UNDER 14 YEARS. THIS IS NOT A TOY.

GENERAL SAFETY PRECAUTIONS AND WARNINGS

KEEP CLEAR OF THE SPINNING PROPELLERS!

DO NOT FLY NEARBY TALL BUILDINGS/OBSTRUCTIONS (100' MINIMUM CLEARANCE REQUIRED)

THE MAXIMUM FLYING ALTITUDE FOR THIS AIRCRAFT IS 8000FT ABOVE SEA LEVEL!

DO NOT FLY OVER CROWDS!

DO NOT FLY NEAR AIRPORTS!

DO NOT FLY IN WINDS THAT EXCEED 8-12 MPH (13-19 KPH)!

WARNING: Failure to use this product in the intended manner as described in the quick start guide and instruction manual can result in damage to the product, property and/or cause serious injury. A Radio Controlled (RC) multirotor aircraft, APV platform, drone, etc. is not a toy! If misused it can cause serious bodily harm and damage to property.

WARNING: As the user of this product you are solely and wholly responsible for operating it in a manner that does not endanger yourself and others or result in damage to the product or the property of others.

- Keep your hands, face and other parts of your body away from the spinning propellers/rotor blades and other moving parts at all times. Keep items that could impact or become entangled away from the propellers/rotor blades including debris, parts, tools, loose clothing, etc.
- Always operate your aircraft in open areas that are free from people, vehicles and other obstructions. Never fly near or above crowds, airports or buildings.
- To ensure proper operation and safe flight performance never attempt to operate your aircraft nearby buildings or other obstructions that do not offer a clear view of the sky and can restrict GPS reception.
- Do not attempt to operate your aircraft in areas with potential magnetic and/or radio interference including areas nearby broadcast towers, power transmission stations, high voltage power lines, etc.
- Always keep a safe distance in all directions around your aircraft to avoid collisions and/or injury. This aircraft is controlled by a radio signal subject to interference from many sources outside your control. Interference can cause momentary loss of control.
- To ensure proper and safe operation of the automatic landing function in Home Mode you must start the motors with the aircraft in a position that has at least 10 feet (approximately 3 meters) of clear and open space around it and achieve a proper GPS lock.
- Do not attempt to operate your aircraft with any worn and/or damaged components, parts, etc. (including, but not limited to, damaged propellers/rotor blades, old batteries, etc.).
- Never operate your aircraft in poor or severe weather conditions including heavy winds, precipitation, lightning, etc.

- Always operate your aircraft starting with a fully charged battery. Always land as soon as possible after the first level low voltage battery warning or land immediately after the second level low voltage battery warning (as indicated by the vibrations and audible alerts from the transmitter/personal ground station).
- Always operate your aircraft when the voltage of the battery in the transmitter/personal ground station is in a safe range (as indicated by the battery charge status icon on the screen of the transmitter/personal ground station).
- Always keep the aircraft in clear line of sight and under control, and keep the transmitter/personal ground station powered on while the aircraft is powered on.
- Always move the throttle control stick down fully and turn off the motors in the event the propellers/rotor blades come into contact with any objects.
- Always allow components and parts to cool after use before touching them and flying again.
- Always remove batteries after use and store/transport them per the corresponding guidelines.
- Avoid water exposure to all electronic components, parts, etc. not specifically designed and protected for use in water. Moisture causes damage to electronic components and parts.
- Never place any portion of the aircraft or any related accessories, components or parts in your mouth as doing so could cause serious injury or even death.
- Always keep chemicals, small parts and electronic components out of the reach of children.
- Carefully follow the instructions and warnings included with this aircraft and any related accessories, components or parts (including, but not limited to, chargers, rechargeable batteries, etc.).

CAUTION: The electronic speed controls (ESCs) installed in the Q500 are not compatible with any other product, and the Q500 is not compatible with any other ESCs. Use of any other ESCs in the Q500 will cause a crash, which may result in damage to the product, property and/or cause serious injury.

FCC INFORMATION

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This product contains a radio transmitter with wireless technology which has been tested and found to be compliant with the applicable regulations governing a radio transmitter in the 2.400GHz to 2.4835GHz frequency range.

Antenna Separation Distance:

Maintain a separation distance of at least 2 in (50mm) between your body (not including your fingers, hands and wrists) and the antennas to meet the RF exposure safety requirements determined by FCC regulations.

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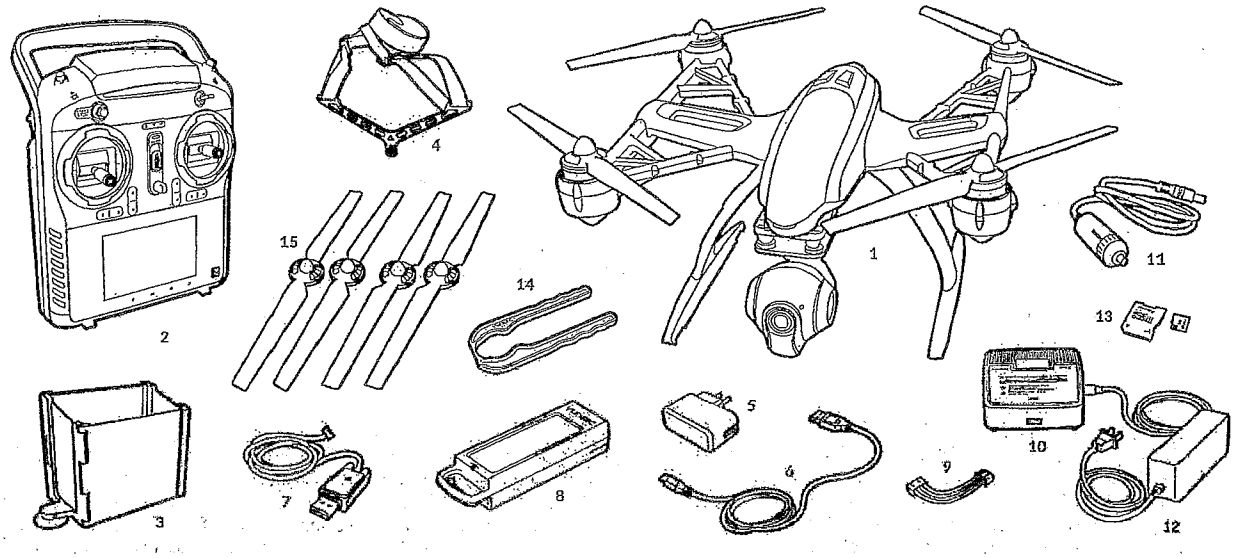
Q500 RTF CONTENTS

The Q500 RTF includes everything needed to fly right out of the box. There's nothing extra to buy or provide!



1 Q500 RTF Airframe w/Installed CGO2-GB
2 ST10 Transmitter and Personal Ground Station
3 ST10 LCD Screen Sun Shade/Shield
4 ST10 Neck Strap
5 AC to DC USB Adapter/Charger
6 USB to Micro USB Cable
7 USB Interface/Programmer
8 5400mAh 3S 11.1V LiPo Battery
9 3S 11.1V LiPo Balance Connector Charge Lead
10 DC 3S 11.1V LiPo Balancing Charger
11 DC Automobile Accessory Socket/ Cigarette Lighter Receptacle Adapter
12 AC to DC Adapter/Power Supply
13 8GB microSD Card w/Adapter
14 Motor Holder/Prop Installation Tool
15 Propellers/Rotor Blades (2 sets)

BATTERY WARNINGS AND USAGE GUIDELINES

WARNING: Lithium Polymer (LiPo) batteries are significantly more volatile than alkaline, NiCd or NiMH batteries. All instructions and warnings must be followed exactly to prevent property damage and/or serious injury as the mishandling of LiPo batteries can result in fire. By handling, charging or using the included LiPo battery you assume all risks associated with LiPo batteries. If you do not agree with these conditions please return the complete product in new, unused condition to the place of purchase immediately.

- You must always charge the LiPo battery in a safe, well-ventilated area away from flammable materials.
- Never charge the LiPo battery unattended at any time. When charging the battery you must always remain in constant observation to monitor the charging process and react immediately to any potential problems that may occur.
- After flying/discharging the LiPo battery you must allow it to cool to ambient/room temperature before recharging.
- To charge the LiPo battery you must use only the included charger or a suitably compatible LiPo battery charger. Failure to do so may result in a fire causing property damage and/or serious injury.
- If at any time the LiPo battery begins to balloon or swell, discontinue charging or discharging immediately. Quickly and safely disconnect the battery, then place it in a safe, open area away from flammable materials to observe it for at least 15 minutes. Continuing to charge or discharge a battery that has begun to balloon or swell can result in a fire. A battery that has ballooned or swollen even a small amount must be removed from service completely.
- Do not over-discharge the LiPo battery. Discharging the battery too low can cause damage to the battery resulting in reduced power, flight duration or failure of the battery entirely. LiPo cells should not be discharged to below 3.0V each under load.
- Store the LiPo battery at room temperature and in a dry area for best results.
- When charging, transporting or temporarily storing the LiPo battery the temperature range should be from approximately 40–120° F (5–49° C). Do not store the battery or aircraft in a hot garage, car or direct sunlight. If stored in a hot garage or car the battery can be damaged or even catch fire.
- Never leave batteries, chargers and power supplies unattended during use.
- Never attempt to charge low voltage, ballooned/swollen, damaged or wet batteries.
- Never allow children under 14 years of age to charge batteries.
- Never charge a battery if any of the wire leads have been damaged or shorted.
- Never attempt to disassemble the battery, charger or power supply.
- Never drop batteries, chargers or power supplies.
- Always inspect the battery, charger and power supply before charging.
- Always ensure correct polarity before connecting batteries, chargers and power supplies.
- Always disconnect the battery after charging.
- Always terminate all processes if the battery, charger or power supply malfunctions.

IMPORTANT NOTE: It's safer and better for the longevity of the battery to store it only partially charged for any length of time. Storing the battery approximately 50% charged (which is around 3.85V per cell) is typically best, however, it will take some careful management of the charge time and the use of a volt meter to achieve this voltage. If you have the equipment and skills to achieve the 50% charge level for storage it is recommended. If not, simply be sure to not store the battery fully charged whenever possible. In fact, as long as the battery will be stored at approximately room temperature and for no more than a few weeks before the next use, it may be best to store the battery in the discharged state after the last flight (as long as the battery was not over-discharged on the last flight).

CHARGING THE BATTERIES

WARNING: Lithium Ion (LiIon) and Lithium Polymer (LiPo) batteries are significantly more volatile than alkaline, NiCd or NiMH batteries. All instructions and warnings must be followed exactly to prevent property damage and/or serious injury as the mishandling of LiIon/LiPo batteries can result in fire. By handling, charging or using the included LiIon/LiPo batteries you assume all risks associated with them. If you do not agree with these conditions please return the complete product in new, unused condition to the place of purchase immediately.

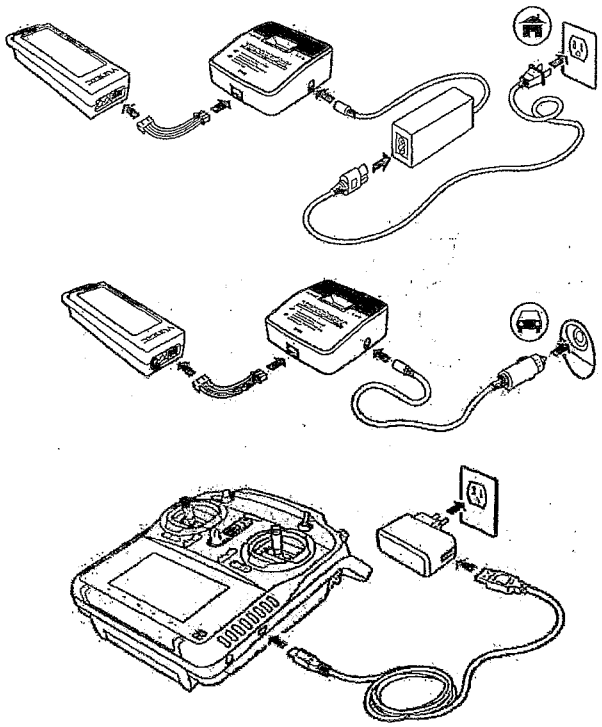
CHARGING THE LIPO FLIGHT BATTERY

You can power the SC3500-3 charger from a 100-240V AC outlet using the AC adapter/power supply, or from a 12V DC accessory socket/cigarette lighter receptacle in a vehicle using the corresponding adapter. Once you've verified the charger is powered on and ready to charge (green blinking LED), plug the balance connector charge lead into the charger, then connect the LiPo flight battery to the charge lead. The battery will begin charging (red blinking LED) and it will take approximately 2 hours to charge a fully discharged (not over-discharged) battery.

CHARGING THE LI-ION ST10 BATTERY

You can charge the LiIon battery installed in the ST10 from a 100-240V AC outlet using the USB adapter/charger, or from a suitable USB power source (2.0 amps max), with the USB to micro USB cable. While the ST10 is powered off connect the cable to the USB adapter/charger, then plug it into the USB connector/charging port on the right side. After approximately 30-45 seconds the LED indicator for the battery will blink blue while the battery is charging, and will glow solid blue when the battery is fully charged. It will take approximately 5.5 hours to charge a fully discharged (not over-discharged) battery.

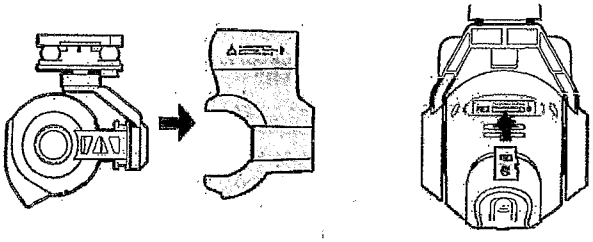
NOTE: The AC plug type will vary depending on the region in which the product was imported/purchased (AU = Australian; EU = European; UK = United Kingdom; US = United States).



PREPARING THE CGO2-GB

WARNING: Before installing the flight battery and powering on the Q500 you MUST remove the cover/lock from the rear of the CGO2-GB by carefully sliding it backward. Failure to remove the cover/lock can result in damage to the Q500 and the CGO2-GB!

QUICK TIP: It's a good idea to re-install the cover/lock after each flying session and while transporting/storing the Q500 (just remember to remove the cover/lock before powering on the Q500 and CGO2-GB!).



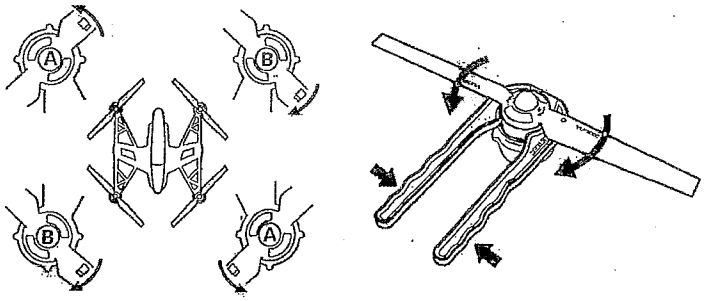
Step 1) Remove the cover/lock from the rear of the CGO2-GB by carefully sliding it backward.

Step 2) Slide the microSD card into the corresponding slot on the bottom of the CGO2-GB. You can use the included 8GB card or any Class 10 microSD card up to 128GB.

Step 3) Carefully remove the protective material from the camera lens.

INSTALLING THE PROPELLERS

WARNING: We recommend wearing gloves and using extreme care when installing the propellers/rotor blades.



Each motor and propeller are marked with an 'A' or 'B' to ensure easy installation in the correct positions (for example: install propellers marked with 'A' on motors marked with 'A').

IMPORTANT NOTE: It is NOT possible to install a propeller marked with 'A' on a motor marked with 'B'. The threads go in different directions for the 'A' and 'B' motors/propellers.

Step 1) Use the special tool (included) to hold the motor so it cannot spin.

CAUTION: Do not over-tighten the propellers when using the tool.

Step 2) Install the corresponding propeller by rotating it trialing edge first until it's secure against the o-ring located at the bottom of the motor shaft.

Step 3) Repeat steps 1 and 2 to install the three remaining propellers securely.

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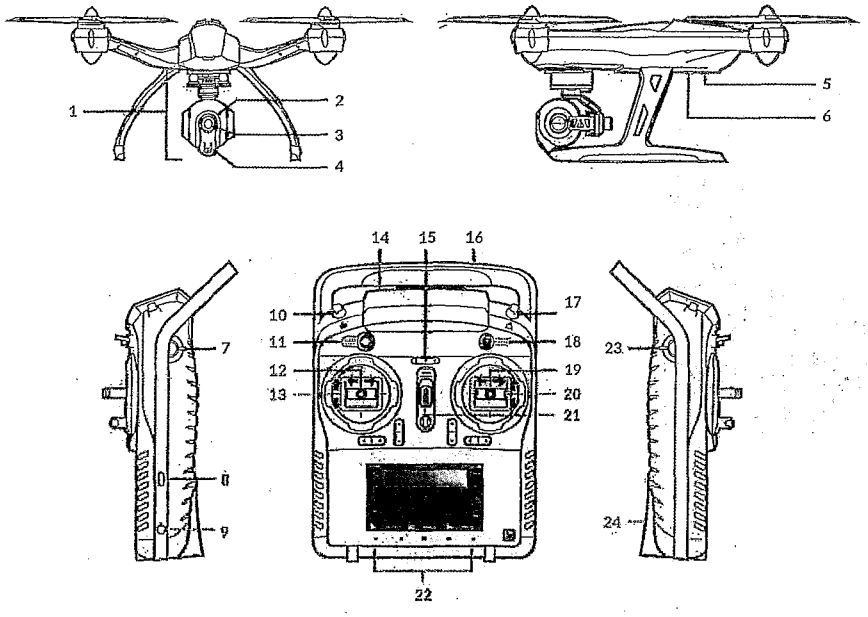
Q500, CGO2-GB AND ST10 OVERVIEW



The ST10 is equipped with an internal cooling fan and components that deliver vibrating and audible alerts.

IMPORTANT NOTE: Although the ST10 is equipped with digital 'trims' (located below the control sticks) they are not active/functional when controlling the Q500.

Q500 / CGO2-GB

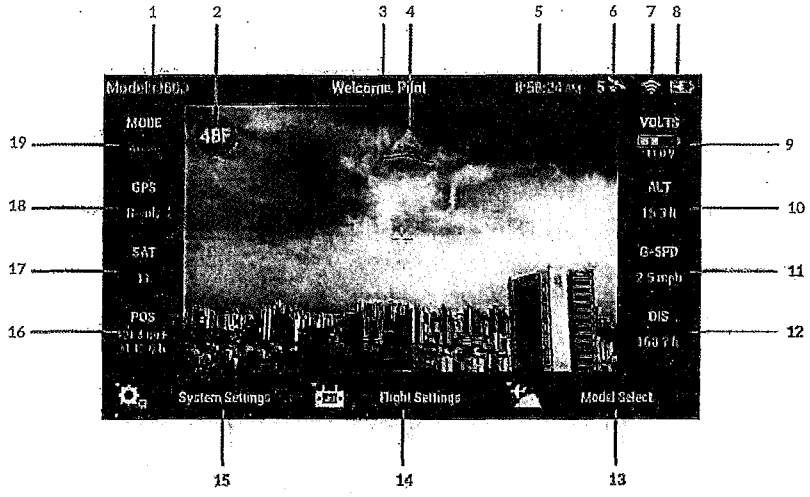
1 CGO2-GB Gimbal Camera
2 Camera LED Status Indicator
3 Camera Lens
4 5.8GHz Antenna
5 Main LED Status Indicator
6 Power Switch

ST10

7 Proportional Control Rate Slider
8 USB Connector/Charging Port
9 Audio/Earphone Jack
10 Take Still Photo Button
11 Start/Stop Motors Button
12 Rudder/Yaw Control *(for Mode 2 and Mode 1)*
13 Throttle/Altitude Control *(for Mode 2)*
Elevator/Pitch Control *(for Mode 1)*
14 5.8GHz Antenna *(located inside the case)*
15 Status Indicators *(for ST10 battery, 5.8GHz WiFi and GPS)*
16 2.4GHz Antenna *(located inside the handle)*
17 Start/Stop Video Recording Button
18 Flight Mode Selection Switch
19 Aileron/Roll Control *(Mode 2 and Mode 1)*
20 Elevator/Pitch Control *(Mode 2)*
Throttle/Altitude Control *(Mode 1)*
21 Power Switch
22 Volume and Navigation Touch-Activated Buttons *(Volume Down/Volume Up/Menu/Home/Back)*
23 CGO2-GB Pitch Angle/Position Control Slider
24 SD Card Slot *(located under the battery)*

ST10 DISPLAY

The ST10 is equipped with a touchscreen display that allows for changing various settings and viewing real-time telemetry data and streaming video during flight.



1 Model Name
2 Frames Per Second for Video Recording Button
3 Status Information
4 Direction to Home Point
5 Clock/Current Time
6 GPS Status and Number of Satellites for ST10
7 5.8GHz WiFi Video Link Status
8 ST10 Battery Charge Level Status Icon
9 Aircraft Battery Voltage
10 Altitude of Aircraft (Above Ground Level)
11 Ground Speed of Aircraft
12 Distance of Aircraft from Home Point
13 Model Select Menu Button
14 Flight Settings Menu Button
15 System Settings Menu Button
16 Latitude/Longitude Position of Aircraft
17 Number of Satellites for Aircraft
18 GPS Status for Aircraft
19 Flight Mode of Aircraft

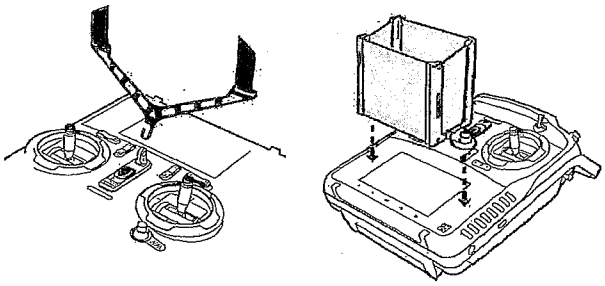
QUICK TIP: Double tap on the screen to increase the size of the video viewing area to full-screen and double tap again to return to the standard size).

WARNING: NEVER attempt to fly the Q500 via First-Person View (FPV). There's a slight 'lag' in the CGO2-GB streaming video downlink to the ST10, and as a result the streaming video/FPV should only be used for aligning camera shots and not for flying! Attempting to fly via FPV can result in a crash that will cause damage to the product, property and/or cause serious injury.

IMPORTANT NOTE: Streaming video from the CGO2-GB to the ST10 and to a separate phone/tablet (or another Yuneec transmitter/personal ground station) at the same time is NOT recommended as it will result in a very significant lag in the video downlink.

ST10 ACCESSORIES

You can install the included and optional-use Neck Strap to help hold and support the ST10. You can also install the included and optional-use LCD Screen Sun Shade/Shield to help improve viewing in sun light.

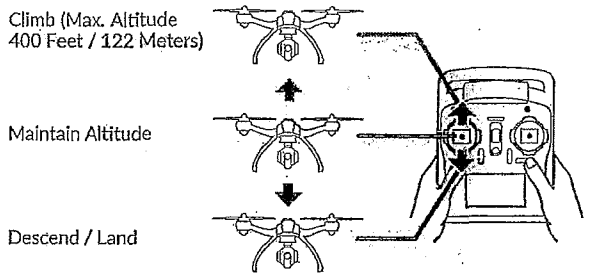


QUICK TIP: It may be helpful to apply suitable anti-glare screen protector material over the LCD screen to further improve viewing in sun light.

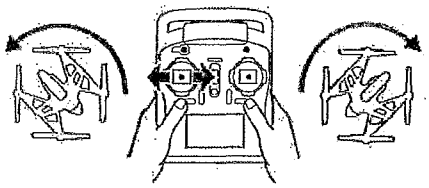
FLIGHT CONTROLS

NOTE: The information in this and the following sections refers to the default 'Mode 2' control configuration of the ST10. The left-hand stick on the ST10 controls the throttle (climb/descend) and rudder (yaw left/right) channels.. When the left-hand stick (also known as the throttle stick) is in the middle position during flight the Q500 will maintain the current altitude. As you move the stick upward the Q500 will climb, and as you move the stick downward the Q500 will descend. The farther away from the middle position you move the stick the faster the Q500 will climb or descend.

IMPORTANT NOTE: The maximum altitude is limited to 400 feet (122 meters) AGL (Above Ground Level) in both Smart and Angle (Pilot) Mode. And although this limit can be adjusted using the USB interface/programmer and software we strongly recommend using the default limit at all times.

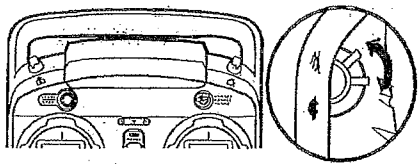


Moving the left-hand stick to the left will turn (yaw) the nose of the Q500 to the left about the vertical axis. And moving the stick to the right will turn (yaw) the nose of the Q500 to the right.



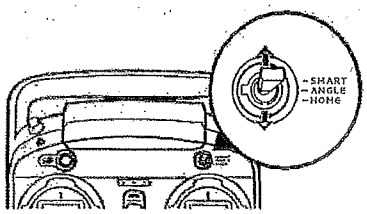
PROPORTIONAL CONTROL RATE SLIDER

The Proportional Control Rate Slider located on the right side of the ST10 allows you to set the overall climb/descend and directional control rates. Use the turtle position for the lowest control rates (best for first-time pilots and required when flying between 5000 feet and 8000 feet Above Mean



SELECTING A FLIGHT MODE

The Q500 is programmed with three (3) flight modes that can be selected via the Flight Mode Selection Switch located just above the right-hand control stick.

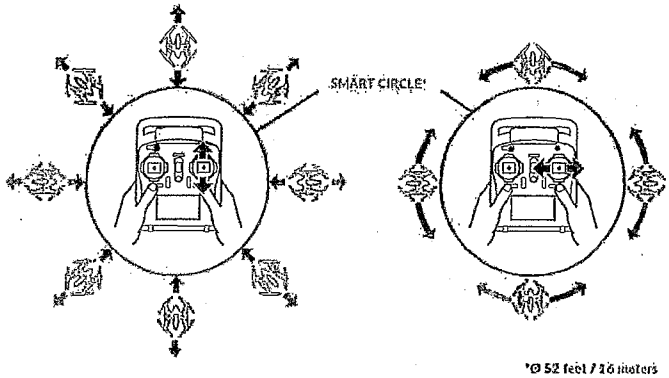


FLIGHT CONTROLS - SMART MODE

When the Flight Mode Selection Switch is the top position the Q500 will be in Smart Mode.

Although we recommend learning to fly the Q500 in Angle (Pilot) Mode as soon as possible, Smart Mode is typically the best mode for first-time pilots to fly in and also features 'Follow Me'.

In Smart Mode the Q500 will always move in the direction the right-hand control stick is pushed relative to the pilot and no matter which way the front/nose is pointed. So if you push the stick to the left the Q500 will always move to the left, regardless of the direction the nose is pointing and even if it's spinning. This mode can also be helpful for pilots that lose orientation while flying in Angle (Pilot) Mode.



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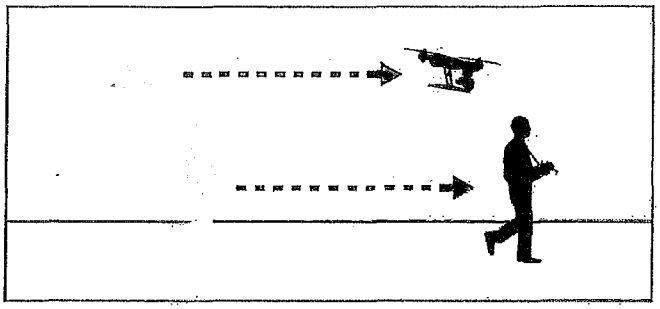
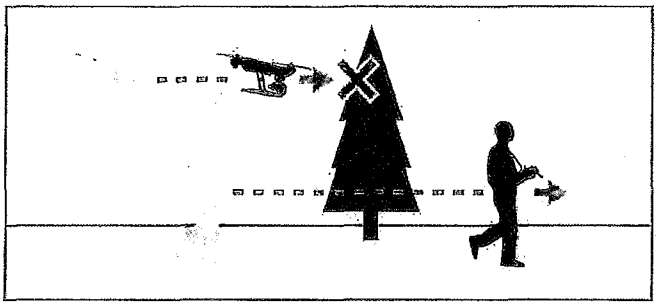
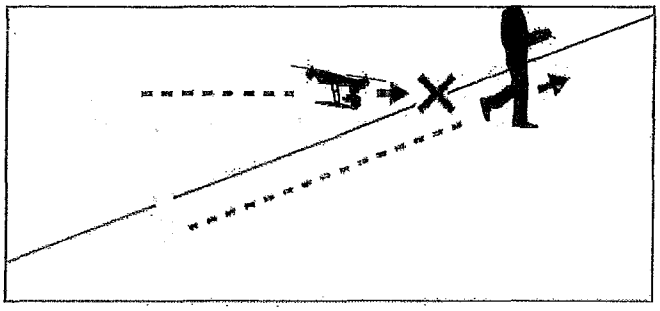
The Follow Me feature the Q500 Typhoon to follow the pilot, adjusting its location to the location of the ST10. The Follow Me feature is enabled when the number of connected satellites is 6 or more. When Follow Me is active the Q500's Main LED Status Indicator will blink white every three seconds. If the Q500's Main LED Status Indicator remains solid green, the Follow Me feature is not enabled.



When using the FOLLOW ME feature, keep in mind that the aircraft will maintain a constant altitude and can not detect obstacles. Pilots who change their altitude by for example, moving to higher ground, during flight should be mindful of this.





Additional Smart Mode Features:

*SMART CIRCLE

In most cases the Smart Circle will keep the Q500 from coming within approximately 26 feet (8 meters) of you (as long as you position yourself at least 26 feet/8 meters behind the Q500.

GEO-FENCE

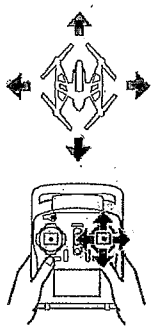
The geo-fence is a virtual 'barrier' that will keep the Q500 from traveling farther than 300 feet (91 meters). And although this limit can be adjusted using the USB interface/programmer and software we strongly recommend using the default limit at all times.

WARNING: Smart Mode only works when the Q500 has a suitable GPS signal/lock. If you take off in Smart Mode and the Q500 loses GPS signal/lock it will switch to Angle (Pilot) Mode automatically. This is why we strongly recommend learning to fly in Angle (Pilot) Mode as soon as possible. Otherwise, if you lose GPS signal/lock and are not able to properly control the Q500 in Angle (Pilot) Mode the aircraft may crash or even 'fly away'.

IMPORTANT NOTE: Crash damage and 'fly aways' are NOT covered under warranty.

FLIGHT CONTROLS - ANGLE (PILOT) MODE

When the Flight Mode Selection Switch is the middle position the Q500 will be in Angle (also known as Pilot) Mode.



Angle (Pilot) Mode is the mode preferred by experienced RC/drone pilots because the Q500 will move in the direction the control stick is pushed relative to the front/nose of the aircraft. So if you push the right-hand stick to the left the Q500 will bank toward the left side and move to the left. This means if the front/nose of the Q500 is pointing away from you it will move to the left, but if the front/nose is pointing at you the Q500 will move to the right.

Additional Angle (Pilot) Mode Features:

POSITION HOLD AND SELF-LEVELING

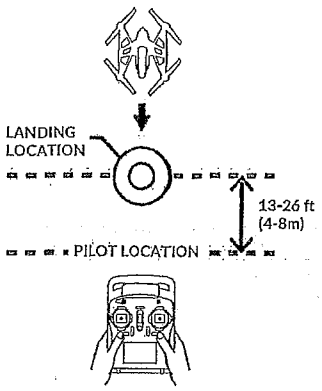
The Q500 will automatically hold its position (with a suitable GPS signal/lock) and maintain a level attitude when the right-hand stick is centered.

WARNING: If you do not properly control the Q500 in Angle (Pilot) Mode the aircraft may crash or even 'fly away'.

IMPORTANT NOTE: Crash damage and 'fly aways' are NOT covered under warranty.

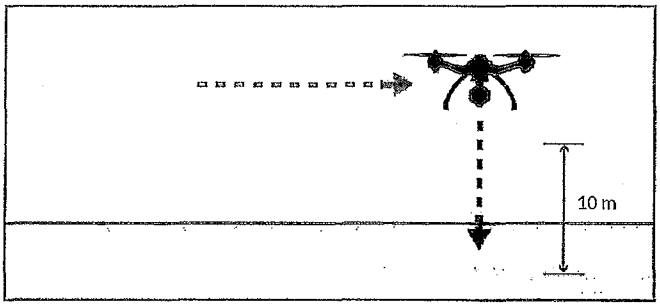
FLIGHT CONTROLS - HOME MODE

When the Flight Mode Selection Switch is in the bottom position the Q500 will be in Home (also known as Return to Home) Mode.

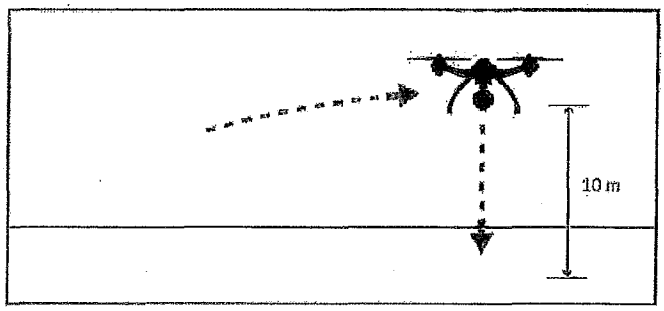


In Home Mode the the Follow Me feature will fly back the Q500 in a straight line in the direction of the pilots' current location, and automatically land within 13-26 ft (4-8m) of the pilot. This can be very helpful for first-time pilots who aren't quite ready to land the Q500 themselves. It can also be helpful for pilots that lose orientation during flight; simply activate Home Mode until the Q500 automatically moves toward the home position, and once you've confirmed orientation switch back to Angle (Pilot) Mode. And if the Q500 ever loses the link with the ST10 it will automatically enter Home Mode. **When Home Mode is activated the Q500 will respond as follows:**

A) When flying higher than 33 feet (10 meters) the Q500 will maintain the current altitude, fly back to the home point, then descend vertically until it lands.



B) When flying lower than 33 feet (10 meters) the Q500 will climb to 33 feet (10 meters) while flying back to the home point, then will descend vertically until it lands.



CAUTION: You must be certain there are no obstacles in the 'Return to Home' flight path otherwise the Q500 may come into contact with them and crash. And while the Q500 is in Home Mode you will have a limited amount of directional control to help avoid obstacles, however, we strongly recommend switching to Smart or Angle Mode to avoid the obstacle (then you can switch back to Home Mode).

WARNING: Home Mode only works when the Q500 has a suitable GPS signal/lock. If the Q500 loses GPS signal/lock it will switch to Angle (Pilot) Mode automatically. This is why we strongly recommend learning to fly in Angle (Pilot) Mode as soon as possible. Otherwise, if you lose GPS signal/lock and are not able to properly control the Q500 in Angle (Pilot) Mode the aircraft may crash or even 'fly away'.

IMPORTANT NOTE: Crash damage and 'fly aways' are NOT covered under warranty.

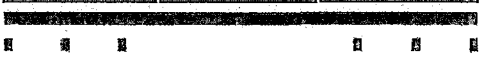
LED STATUS INDICATIONS

LED STATUS INDICATIONS DURING STARTUP

Main LED Status Indicator		
Initialization in progress	Flashes red, green and blue (2 times per second)	
Initialization failed	Pulses red (3 times per second)	
The aircraft is in 'bind' mode	Flashes orange very rapidly (10 times per second)	
The aircraft is not connected/linked to the transmitter	Flashes blue rapidly (5 times per second)	
The aircraft is in a no-fly zone*	Flashes red and white rapidly (5 times per second)	

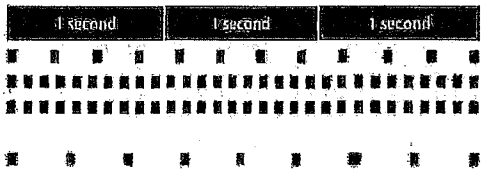
*Please see the instruction manual for more information regarding no-fly zones

LED STATUS INDICATIONS BEFORE/DURING FLIGHT

Main LED Status Indicator		
The aircraft is in Smart Mode with GPS lock	Glows solid green	
The aircraft is in Smart Mode without GPS lock	Flashes green (3 times per second) then off (for 1 second)	
The aircraft is in Angle Mode with GPS lock	Glows solid purple	
The aircraft is in Angle Mode without GPS lock	Flashes purple (3 times per second) then off (for 1 second)	
The aircraft is in Home Mode	Flashes red rapidly (5 times per second)	
First level low voltage battery warning	Flashes red, green and blue every 3 seconds	

Second level low voltage battery warning	Flashes red, green and blue continuously	
GPS lost	Flashes purple (1 flash per second)	
Compass calibration required	Flashes orange twice between any LED indication (when in the air)	
Below Motor LED Status Indicators		
Low voltage battery warning	Flash rapidly (5 times per second)	
GPS disabled/lost	Flash 3 times per second then off 1 second second	

LED STATUS INDICATIONS FOR CALIBRATION MODES

Main LED Status Indicator		
Compass calibration Mode entered	Flashes red and green slowly (2 times per second)	
Compass calibration started	Flashes red and green rapidly (5 times per second)	
Accelerometer calibration started	Flashes red, green and blue rapidly (3 times per second)	
Accelerometer calibration Mode entered/data collection finished	Flashes red, green and blue slowly (1 time per second)	
Calibration failed	Glows solid white	

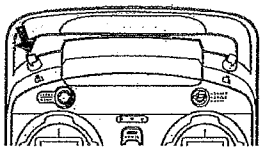
CGO2-GB CAMERA LED STATUS INDICATIONS

WiFi / camera initialization in progress	Glows solid red	
MicroSD card error or missing microSD card	Flashes yellow (1 time per second)	
Ready	Glows solid green	
Taking still photo	Glows solid blue (1 time for 2 seconds)	
Recording video	Flashes green, blue slowly (1 time per 2 seconds)	

TAKING PHOTOS AND RECORDING VIDEO

The ST10 seamlessly integrates control of the CGO2-GB so you can easily take still photos and start/stop video recording using the corresponding buttons located on top:

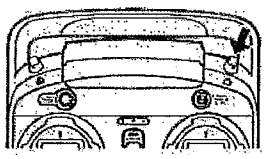
TO TAKE A STILL PHOTO



Press the button located near the top left corner of the ST10. You'll hear an audible 'shutter' sound from the ST10 and the LED indicator on the front of the CGO2-GB will change from glowing solid green to glowing solid blue. It will take approximately 5 seconds to capture the photo and before you can take another still photo.

IMPORTANT NOTE: You cannot take still photos while recording video. You MUST stop recording video in order to take still photos.

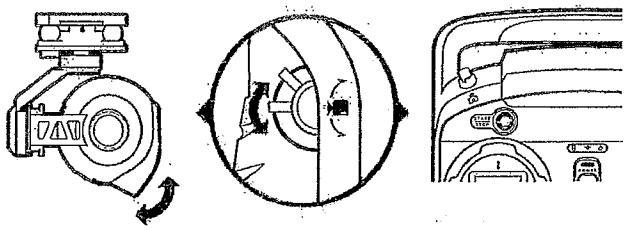
TO START/STOP RECORDING VIDEO



Press the button located near the top right corner of the ST10. You'll hear an audible indication from the ST10 each time the recording starts/stops. And while video is recording the LED indicator on the front of the CGO2-GB will flash blue and green, and there will be a red dot next to the time length of the recording near the upper right-hand corner on the screen of the ST10.

IMPORTANT NOTE: You can choose to record video at 48, 50 (PAL) or 60 (NTSC) frames per second by tapping the corresponding button near the upper left-hand corner on the screen of the ST10. And keep in mind that the delay in the live video stream will be lowest at 48 and 50 as compared to 60 frames per second.

The slider located on the left side of the ST10 allows you to set the pitch/tilt position of the CGO2-GB from approximately straight ahead (when the slider is in the uppermost position) to approximately straight down (when the slider is in the lowermost position). And you can easily set a position in between by adjusting the slider accordingly.

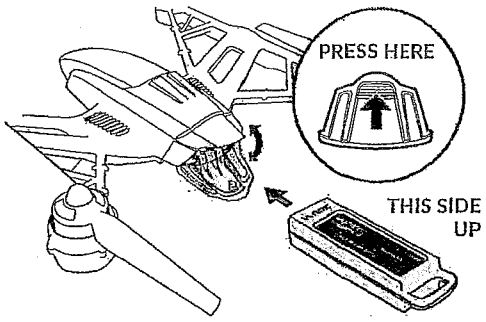


QUICK TIP: There's an adjustable counterbalance located on the rear of the CGO2-GB. This counterbalance has been adjusted at the factory to provide the best balance and performance overall so typically it should NOT need to be adjusted. However, if you find that the CGO2-GB is making any 'buzzing' sounds while powered on, carefully twist the counterbalance in or out until the sound stops in order to achieve the best balance, performance and photo/video quality.

INSTALLING THE FLIGHT BATTERY

After the flight battery has been fully charged it's ready to be installed in the Q500:

IMPORTANT NOTE: Keep the Q500 level relative to the ground when installing the battery.



STEP 1) Push the area at the top of the battery door to release the latch/lock, and then open the door.

STEP 2) With the side of the battery cartridge that has the 'UP' arrow marking oriented upward, hold the handle and slide the battery into the battery compartment until you feel the connector make a positive connection.

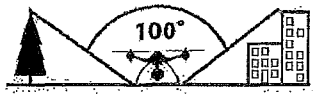
NOTE: If you do not install the battery in the correct orientation it will not be possible to make a positive connection.

STEP 3) Close the battery door by pushing the area at the top to engage the latch/lock.

NOTE: If the door will not close because it's coming into contact with the handle on the battery cartridge, the battery is not inserted far enough to engage the connector properly.

GPS FUNCTIONALITY

The Q500 requires a suitable GPS signal/lock in order to start the motors and to be flown. This means it should only be operated outdoors in open areas that are free from people, vehicles and other obstructions. And in order to acquire a suitable GPS signal/lock it's critical that the GPS antenna installed in the top of the Q500 always have a clear view of the sky (100° minimum clearance required).



WARNING: Do NOT attempt to fly near or between tall buildings/obstructions, near or under dense vegetation, structures or indoors. Do NOT attempt to fly the Q500 with GPS enabled indoors or in any location known to have poor GPS coverage. And do NOT disable/turn off GPS unless you're able to properly control the Q500 in Angle (Pilot) Mode without GPS assistance and accept ALL responsibility and liability for crashes or 'fly aways'.

If the Q500 loses GPS signal/lock while flying it can only be flown in Angle (Pilot) Mode. Smart Mode and Home Mode, along with their corresponding features, will no longer work. And the Main LED Status Indicator will flash purple and the Below Motor LED Status Indicators will flash three (3) times per second then will stay off for one (1) second when the Q500 loses GPS signal/lock (or if GPS has been disabled/turned off).

If the GPS signal/lock is reacquired (after receiving 5-10 seconds of suitable GPS signal), Smart Mode and Home Mode will work again.

WARNING: Loss of GPS signal/lock may result in a crash or even a 'fly away'.

IMPORTANT NOTE: Crash damage and 'fly aways' are NOT covered under warranty.

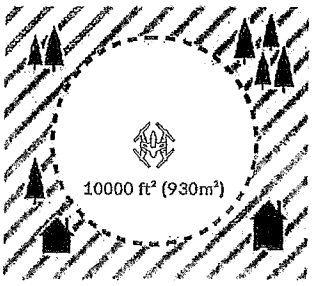
NO-FLY ZONES

With a suitable GPS signal/lock it will not be possible to start the motors, takeoff or fly the Q500 in the 'No-Fly Zones' within a 4 mile (6.4 kilometer) radius of most major airports.

PREPARING TO FLY

WARNING: Before flying you MUST review and understand all of the NOTICES AND WARNINGS and the GENERAL SAFETY PRECAUTIONS AND WARNINGS found near the beginning of this instruction manual. Failure to operate this product in a safe and responsible manner could result in damage to the product, property and/or cause serious injury.

WARNING: Always operate the Q500 in open areas (approximately 10000 square feet/930 square meters or more) that are free from people, vehicles, trees and other obstructions. Never fly near or above crowds, airports or buildings.



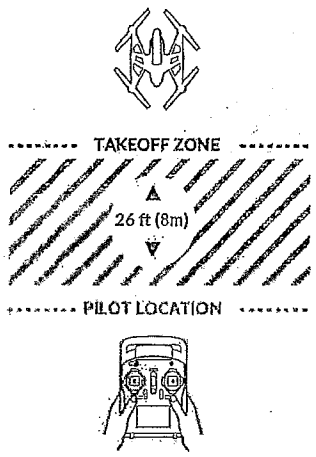
Never attempt to operate the Q500 nearby tall buildings/obstructions that do not offer a clear view of the sky (a minimum clearance of 100').

After selecting a suitable flying area, please follow these steps:

Step 1) ALWAYS turn the ST10 on and allow it to boot up fully BEFORE turning the Q500 on.

IMPORTANT NOTE: If you're a first-time pilot we strongly recommend putting the Flight Mode Selection Switch (located just above the right-hand control stick) in the top position to activate Smart Mode. Or, if you're an experienced RC/drone pilot we strongly recommend putting the switch in the middle position to activate Angle (Pilot) Mode.

Step 2) Place the Q500 on a level and stable surface then slide the power switch to the 'ON' position. **DO NOT TOUCH OR MOVE THE Q500 UNTIL THE INITIALIZATION PROCESS IS COMPLETE.** The Main LED Status Indicator on the bottom of the Q500 will show one of the following indications when initialization is complete:

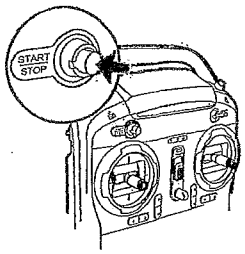


- The Q500 is in Smart Mode with GPS lock Glows solid green
- The Q500 is in Smart Mode without GPS lock Flashes green (3 times per second) then off (for 1 second)
- The Q500 is in Angle (Pilot) Mode with GPS lock Glows solid purple
- The Q500 is in Angle (Pilot) Mode without GPS lock Flashes purple (3 times per second) then off (for 1 second)

Step 3) If you do not have a GPS lock move the Q500 to a different area, turn it off, then back on again. Or, if you have a GPS lock, proceed to the next step.

Step 5) Step back approximately 26 feet (8 meters) behind the Q500.

Step 6) Press and hold the red START/STOP button for approximately three (3) seconds to start the motors. Or you can lower the left-hand stick all the way, move it all the way to the left, then all the way to the right and back to the middle to start the motors.



FLYING

TAKEOFF

WARNING: Do not attempt to operate the Q500 in winds that exceed 8-12 miles per hour (13-19 kilometers per hour).

To takeoff, slowly raise the left-hand stick to slightly above the center position. The Q500 will takeoff and climb slowly (or raise the stick further until it does). Allow the stick to return to the center position when the Q500 reaches the desired altitude.

FLYING

Take your time learning how the Q500 responds to various control inputs while flying. In Smart Mode the Q500 will always move in the direction the right-hand control stick is pushed relative to the pilot and no matter which way the front/nose is pointed. In Angle (Pilot) Mode the Q500 will move in the direction the control stick is pushed relative to the front/nose of the aircraft (and the 'angle' of movement is determined by how far you push the stick away from the center position). And please see the corresponding sections of this instruction manual for more information on Smart Mode and Angle (Pilot) Mode.

IMPORTANT NOTE: If at any time during flight you feel like the Q500 is drifting out of/beyond your control, simply release both control sticks. The Q500 will automatically self-level and will even hold its position (with a suitable GPS signal/lock) when both control sticks are centered. You can also activate Home Mode so the Q500 automatically flies itself back to the home point and lands.

LANDING

There are two ways to land the Q500:

1) Position the Q500 above the area where you would like to land. Slowly lower the left-hand stick to below the center position. The Q500 will descend slowly and land. After the Q500 lands, press and hold the red START/STOP button for approximately two (2) seconds to stop the motors.

2) Activate Home Mode and the Q500 will automatically fly itself back to the home point and will land within a 10 foot (3 meter) diameter circle around it.

WARNING: Always land as soon as possible after the first level low voltage battery warning, or land immediately after the second level low voltage battery warning (as indicated by the vibrations and audible alerts from the ST10, and by the Below Motor LED Status Indicators flashing rapidly). And if at any time the Aircraft Battery Voltage shown on the screen is below 10.7V, land the Q500 immediately.

AFTER LANDING

ALWAYS turn off the Q500 BEFORE turning off the ST10. Then remove the battery from the Q500 and allow it to cool to ambient/room temperature before recharging.

WARNING: Do NOT leave the ST10 and Q500 powered on and do NOT leave the flight battery installed in the Q500 as doing so can over-discharge and damage the batteries. Over-discharging can cause damage to the batteries resulting in reduced performance or failure of the batteries entirely.

IMPORTANT NOTE: Battery damage, crash damage and 'fly aways' are NOT covered under warranty.

DISABLING GPS

WARNING: Smart Mode and Home Mode, along with their corresponding features, only work when GPS is active and the Q500 has a suitable GPS signal/lock. If you disable/turn off GPS the Q500 can only be flown in Angle (Pilot) Mode. And if you cannot properly control the Q500 in Angle (Pilot) Mode the aircraft may crash or even 'fly away'.

IMPORTANT NOTE: Crash damage and 'fly aways' are NOT covered under warranty.

We do not typically recommend disabling GPS for any reason, especially if you're a first-time or low-time pilot. However, if you're an experienced pilot that's able to properly control the Q500 in Angle (Pilot) Mode, and you do not exceed any altitude/distance limits or fly in any 'no fly zones' in your area, you can disable/turn off GPS. And do NOT disable/turn off GPS unless you accept ALL responsibility and liability for crashes or 'fly aways'.

IMPORTANT NOTE: Every time you turn the Q500 on it will default to having GPS active/on (even if you disabled GPS the last time is was powered on).

Step 1) While the ST10 and Q500 are powered on and linked (and the motors are NOT running), move the Proportional Control Rate Slider on the right side of the ST10 to the uppermost (rabbit) position.

Step 2) Move the right-hand stick all the way to the right and hold it there until step 3 is completed.

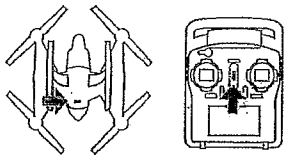
Step 3) Move the Flight Mode Selection Switch from Smart to Home and Home to Smart mode 4 times in 3 seconds.
When GPS has been disabled successfully the Q500 will emit an audible indication and the GPS status on the ST10 screen will show 'Disabled'. Also, the Main LED Status Indicator will flash purple and the Below Motor LED Status Indicators will flash three (3) times per second then will stay off for one (1) second.

GRAPHICAL USER INTERFACE (GUI)

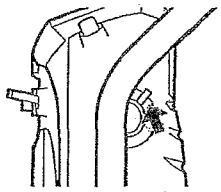
You can download the graphical user interface (GUI) software on the Q500 product page at www.Yuneec.com. Follow the on-screen instructions to install and operate the software which allows you to see the status of all sensors, to adjust various settings, check GPS accuracy, update firmware and more using the included USB Interface/Programmer.

COMPASS CALIBRATION

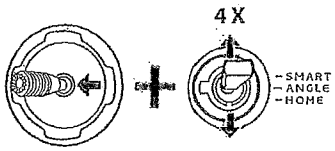
Step 1) Do not calibrate the compass inside parking structures, near buildings or surfaces with metal in them (like roads parking lots with rebar). Only calibrate the compass in open areas/fields far away from power lines and other metallic or concrete surfaces/structures.



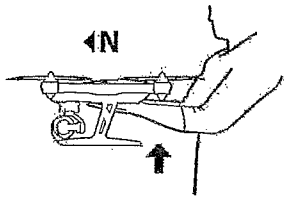
Step 2) Turn on the transmitter and allow it to boot up fully before turning on the aircraft. And when the transmitter and aircraft are powered on and linked proceed to the next step.



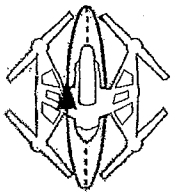
Step 3) Move the Proportional Control Rate Slider on the right side of the ST10 to the uppermost (rabbit) position.



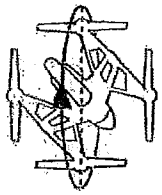
Step 4) Move the left-hand stick all the way to the left and hold it there. Then move the Flight Mode Selection Switch from Smart to Home and Home to Smart mode 4 times.



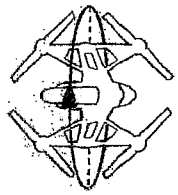
Step 5) When the main LED status indicator flashes red and green slowly (2 times per second) you have entered compass calibration mode. Pick up the aircraft and hold it flat with the nose pointed to the north. After 5 seconds the main LED status indicator should flash red and green rapidly (5 times per second).



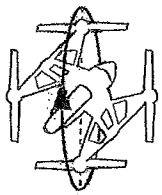
Step 6) Slowly rotate the aircraft 360 degrees toward the north (as illustrated) until it's flat and upright in your hands again.



Step 7) Rotate the aircraft 45 degrees to the left. Then slowly rotate the aircraft 360 degrees toward the north (as illustrated) until it's flat and upright in your hands again.

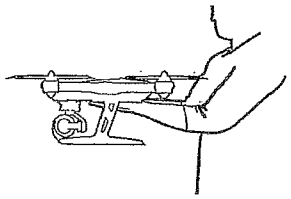


Step 8) Rotate the aircraft 45 degrees to the left. Then slowly rotate the aircraft 360 degrees toward the north (as illustrated) until it's flat and upright in your hands again.



Step 9) Rotate the aircraft 45 degrees to the left. Then slowly rotate the aircraft 360 degrees toward the north (as illustrated) until it's flat and upright in your hands again.

IMPORTANT NOTE: Steps 6 to 9 must be completed in less than 30 seconds in order to successfully complete compass calibration.



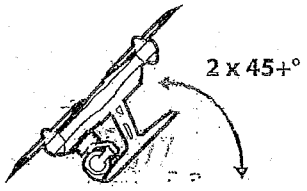
Step 10) The main LED status indicator should be flashing red and green rapidly (5 times per second). Hold the aircraft as still as possible until it main LED status indicator stops blinking rapidly.

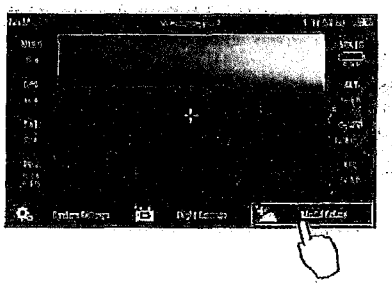
Step 11) If you hear an audible indication after the main LED status indicator stops blinking rapidly you have successfully completed compass calibration.

IMPORTANT NOTE: If compass calibration fails the main LED status indicator will glow solid white and you must restart the calibration process.

ST10 AND RECEIVER BINDING

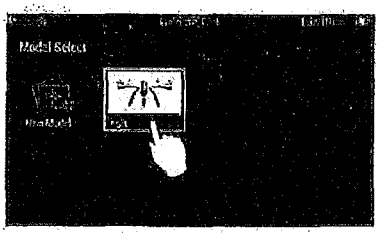
Step 1) Turn on the Q500, and after the Main LED Status Indicator begins to flash blue rapidly, lift the back end upward approximately 45° then back down to 'level' two (2) times to put the aircraft/receiver into bind mode. The Main LED Status Indicator will begin to the flash orange very rapidly when the aircraft/receiver are in bind mode.



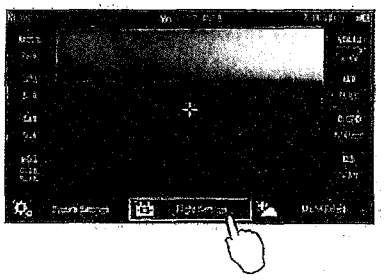


Step 2) Turn on the ST10, and if required tap the screen (outside of the pop up status window) to bypass the RC and WiFi connection process.

Step 3) Tap the 'Model Select' button, and if required press 'OK' to bypass any pop up warnings/alerts.

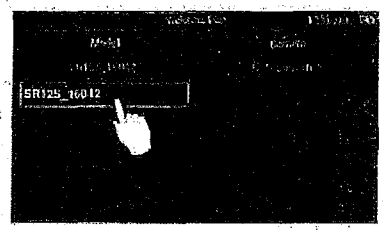


Step 4) Select the existing model (for example: 'Q500') you would like to bind to (or create a 'New Model'), and if required press 'OK' to bypass any pop up warnings/alerts.



Step 5) Tap the 'Flight Settings' button, and if required press 'OK' to bypass any pop up warnings/alerts.

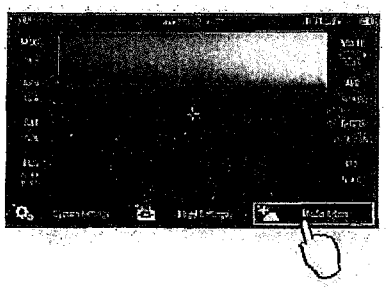
Step 6) Tap the 'Bind' button and select the 'SR12S_XXXXX' receiver listed in the column under 'Model', then tap 'OK' after the connection has been established.

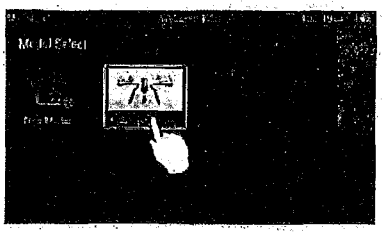


Step 7) Tap the 'Back' button two (2) times to return to the main screen and the model/receiver should automatically connect to the ST10.

ST10 AND CGO2-GB BINDING

Step 1) Turn on the ST10, and if required tap the screen (outside of the pop up status window) to bypass the RC and WiFi connection process.

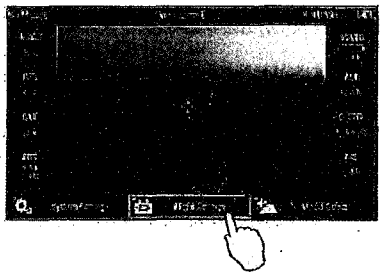


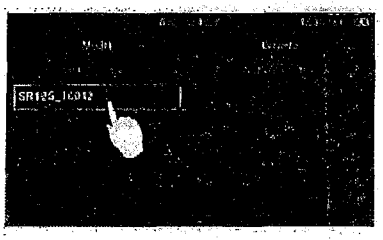


Step 2) Tap the 'Model Select' button, and if required press 'OK' to bypass any pop up warnings/alerts.

Step 3) Select the existing model (for example: 'Q500') you would like to bind to (or create a 'New Model'), and if required press 'OK' to bypass any pop up warnings/alerts.

Step 4) Turn on the Q500 and ensure that the CGO2-GB is powered on.





Step 5) if required tap the screen (outside of the pop up status window) to bypass the RC and WiFi connection process, then tap the 'Flight Settings' button and press 'OK' to bypass any pop up warnings/alerts.

Step 6) Tap the 'Bind' button and select the 'CGO2_XXXXXX' camera listed in the column under 'Camera', then enter the password '1234567890' when prompted and tap 'OK' after the connection has been established.

Step 7) Tap the 'Back' button two (2) times to return to the main screen and the camera should automatically connect to the ST10.

IMPORTANT NOTE: Streaming video from the CGO2-GB to the ST10 and to a separate phone/tablet (or another Yuneec transmitter/personal ground station) at the same time is NOT recommended as it will result in a very significant lag in the video downlink.

TROUBLESHOOTING

ISSUE	POSSIBLE CAUSE	SOLUTION
Q500 will not initialize	The Q500 was moved during initialization.	Turn the Q500 off then back on again, and ensure it does not move during the initialization process.
Flight battery will not charge (red LED on charger glows solid red).	The Q500 flight battery needs to be replaced.	Replace the Q500 flight battery.
Q500 GPS will not lock (ST10 indicates GPS Disabled)	Overcast, thick clouds blocking GPS reception.	Wait for lighter cloud cover or disable GPS*.
	Solar flares in progress.	Wait for disturbance to subside or disable GPS*.
	Q500 is indoors.	Move the Q500 outside or disable GPS*.
	Objects blocking 100 degrees of clear view of the sky.	Disable GPS. Flying indoors/disabling GPS NOT Recommended.
	(Possibly underneath a metallic or glass cover, inside a vehicle, near tall buildings, etc...)	Move Q500 to a clear and open area.
	Video transmitter nearby, such as an aftermarket video downlink system.	Reposition or remove the video transmitter.
	Raised threat level by the U.S. government.	Wait for the threat level to be reduced or disable GPS*.
Q500 GPS has reduced precision	The GPS module is possibly damaged.	Replace the GPS module.
	The compass has been exposed to a magnet.	Move the Q500 away from the magnetic source. If problem persists, calibrate compass.
Q500 GPS functions not operating properly	The GPS module is possibly damaged.	Replace the GPS module.
	GPS lock has not been acquired.	Ensure GPS antenna has clear view of sky and GPS lock has been acquired.

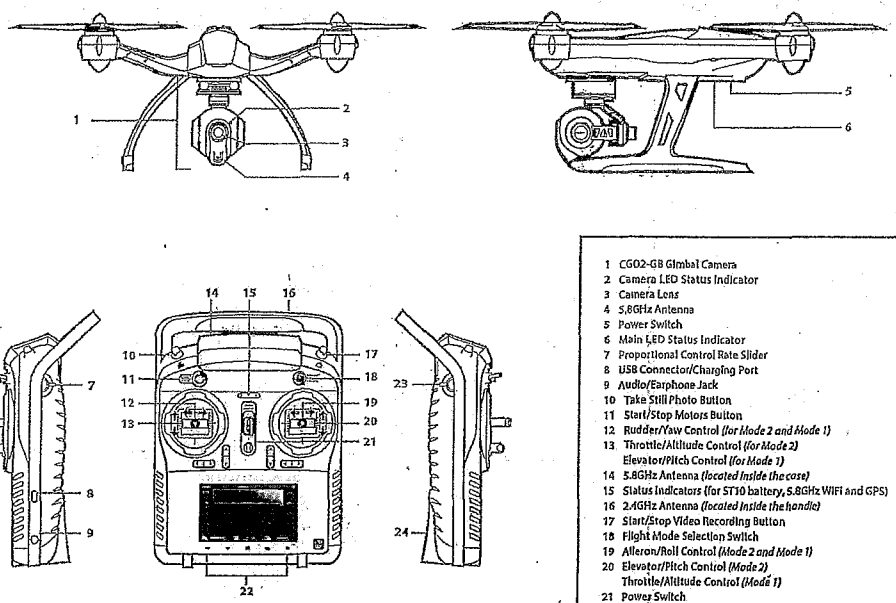
Q500
TYPHOON
QUICK START GUIDE

ISSUE	POSSIBLE CAUSE	SOLUTION
Q500 Motors won't start	'Compass error' is indicated by the LED.	See below for troubleshooting 'compass error'.
	Q500 is in No Fly Zone.	Move at least 4 miles away from no fly zone. Most major airports are no fly zone areas.
	Q500 is above 8,000 feet above MSL.	Move Q500 below 8,000 feet above MSL.
	Incorrect motor start up procedure.	Review Motor Starting/Stopping procedure in manual.
	Q500 is too close to a metal object or metal surface .	Move Q500 away from large metal objects or surfaces.
Q500 Flashes orange twice between indications	Compass needs to be calibrated .	Calibrate compass.
Q500 beeps constantly and motors won't start	EMERGENCY Mode. Possibly due to obstructed propeller during motor start up.	Check that nothing is obstructing any propeller/motor, turn the Q500 off then back on again.
Q500 Won't hold position in hover	Weak GPS signal.	Confirm that the flying area has 100 degrees of clear view of the sky.
	U.S. Government has raised threat level.	Wait for threat level to be reduced before flying.
	Vibration levels high, indicated by shaky landing gear.	Check to ensure propellers are not bent, nicked or damaged in any way. Replace damaged propellers.

WARRANTY INFORMATION

Yuneec products and accessories are guaranteed against manufacturing defects for six (6) months from the original date of purchase. Yuneec's sole obligation in the event of such defects during this period is to repair or replace the defective part or product with a comparable part or product at Yuneec's sole discretion. Except for such repair or replacement, the sale, processing or other handling of this product is without warranty, condition or other liability. Damage (including crash damage) resulting from use, accident, or normal wear and tear is not covered by this or any warranty. Yuneec assumes no liability for any accident, injury, death, loss, or other claim related to or resulting from the use of this product. In no event shall Yuneec be liable for incidental or consequential damages relating to or resulting from the use of this product or any of its parts. Please review the instructions carefully when using the products. Returns or replacements of parts and/or products may be subject to shipping, handling, replacement and/or restocking fees.

IMPORTANT NOTE: Crash damage is NOT covered under warranty.



1 CG02-GB Gimbal Camera
2 Camera LED Status Indicator
3 Camera Lens
4 5.8GHz Antenna
5 Power Switch
6 Main LED Status Indicator
7 Proportional Control Rate Slider
8 USB Connector/Charging Port
9 Audio/Earphone Jack
10 Take Still Photo Button
11 Start/Stop Motors Button
12 Rudder/Yaw Control *(for Mode 2 and Mode 1)*
13 Throttle/Altitude Control *(for Mode 2)*
Elevator/Pitch Control *(for Mode 1)*
14 5.8GHz Antenna *(located inside the case)*
15 Status Indicators (for ST10 battery, 5.8GHz WiFi and GPS)
16 2.4GHz Antenna *(located inside the handle)*
17 Start/Stop Video Recording Button
18 Flight Mode Selection Switch
19 Aileron/Roll Control *(Mode 2 and Mode 1)*
20 Elevator/Pitch Control *(Mode 2)*
Throttle/Altitude Control *(Mode 1)*
21 Power Switch
22 Volume and Navigation Touch-Activated Buttons
(Volume Down/Volume Up/Menu/Home/Back)
23 CG02-GB Pitch Angle/Position Control Slider
24 SD Card Slot *(located under the battery)*

Q500 TYPHOON

YUNEEC ELECTRIC AVIATION

WWW.YUNEEC.COM

NOTICES AND WARNINGS

IMPORTANT NOTE: All safety precautions and warnings, instructions, warranties and other collateral information is subject to change at the sole discretion of Yuneec. For the most up-to-date information please visit the corresponding product page at www.Yuneec.com or contact the nearest Yuneec office or authorized distributor.

The following special language terms are used throughout the product literature to indicate various levels of potential harm when operating this product:

NOTICE: Procedures, which if not properly followed, create a possibility of property damage and/or little to no possibility of injury.
CAUTION: Procedures, which if not properly followed, create the probability of property damage and/or a possibility of serious injury.
WARNING: Procedures, which if not properly followed, create the probability of property damage, collateral damage and/or serious injury or create a high probability of superficial injury.
WARNING: Read the ENTIRE quick start guide and instruction manual to become familiar with the features of the product before operating. Failure to operate the product correctly can result in damage to the product, property and/or cause serious injury.
WARNING: This is a sophisticated consumer product. It must be operated with caution and common sense, and requires some basic mechanical ability. Failure to operate this product in a safe and responsible manner could result in damage to the product, property and/or cause serious injury. This product is not intended for use by children without direct adult supervision. Do not use with incompatible components or alter this product in any way outside of the instructions provided by Yuneec. The quick start guide and instruction manual contain instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings prior to assembly, setup and/or use in order to operate the product correctly and avoid damage or serious injury.

AGE RECOMMENDATION: NOT FOR CHILDREN UNDER 14 YEARS. THIS IS NOT A TOY.

GENERAL SAFETY PRECAUTIONS AND WARNINGS

WARNING: Failure to use this product in the intended manner as described in the quick start guide and instruction manual can result in damage to the product, property and/or cause serious injury. A Radio Controlled (RC) multirotor aircraft, APV platform, drone, etc. is not a toy! If misused it can cause serious bodily harm and damage to property.
WARNING: As the user of this product you are solely and wholly responsible for operating it in a manner that does not endanger yourself and others or result in damage to the product or the property of others. Keep your hands, face and other parts of your body away from the spinning propellers/rotor blades and other moving parts at all times. Keep items that could impact or become entangled away from the propellers/rotor blades including debris, parts, tools, loose clothing, etc.
Always operate your aircraft in open areas that are free from people, vehicles and other obstructions. Never fly near or above crowds, airports or buildings.
To ensure proper operation and safe flight performance never attempt to operate your aircraft nearby buildings or other obstructions that do not offer a clear view of the sky and can restrict GPS reception.
Do not attempt to operate your aircraft in areas with potential magnetic and/or radio interference including areas nearby broadcast towers, power transmission stations, high voltage power lines, etc.
Always keep a safe distance in all directions around your aircraft to avoid collisions and/or injury. This aircraft is controlled by a radio signal subject to interference from many sources outside your control. Interference can cause momentary loss of control.
Do not attempt to operate your aircraft above 8000 feet (2438 meters) AMSL (Above Mean Sea Level).
Do not attempt to operate your aircraft in winds that exceed 8–12 miles per hour (13–19 kilometers per hour).
To ensure proper and safe operation of the automatic landing function in 'Home' mode you must turn your aircraft on in a position with at least 10 feet (approximately 3 meters) of clear and open space around it and achieve a proper GPS lock.
Do not attempt to operate your aircraft with any worn and/or damaged components, parts, etc. (including, but not limited to, damaged propellers/rotor blades, old batteries, etc.).
Never operate your aircraft in poor or severe weather conditions including heavy winds, precipitation, lightning, etc.
Always operate your aircraft starting with a fully charged battery. Always land as soon as possible after the first level low voltage battery warning or land immediately after the second level low voltage battery warning (as indicated by the vibrations and audible alerts from the transmitter/personal ground station).
Always operate your aircraft when the voltage of the battery in the transmitter/personal ground station is in a safe range (as indicated by the battery charge status icon on the screen of the transmitter/personal ground station).
Always keep the aircraft in clear line of sight and under control, and keep the transmitter/personal ground station powered on while the aircraft is powered on.
Always move the throttle control stick down fully and turn off the motors in the event the propellers/rotor blades come into contact with any objects.
Always allow components and parts to cool after use before touching them and before flying again.
Always remove batteries after use and store/transport them per the corresponding guidelines.
Avoid water exposure to all electronic components, parts, etc. not specifically designed and protected for use in water. Moisture causes damage to electronic components and parts.
Never place any portion of the aircraft or any related accessories, components or parts in your mouth as doing so could cause serious injury or even death.
Always keep chemicals, small parts and electronic components out of the reach of children.
Carefully follow the instructions and warnings included with this aircraft and any related accessories, components or parts (including, but not limited to, chargers, rechargeable batteries, etc.).
CAUTION: The electronic speed controls (ESCs) installed in the Q500 are not compatible with any other product, and the Q500 is not compatible with any other ESCs. Use of any other ESCs in the Q500 will cause a crash, which may result in damage to the product, property and/or cause serious injury.

BATTERY WARNINGS AND USAGE GUIDELINES

WARNING: Lithium Polymer (LiPo) batteries are significantly more volatile than alkaline, NiCd or NiMH batteries. All instructions and warnings must be followed exactly to prevent property damage and/or serious injury as the mishandling of LiPo batteries can result in fire. By handling, charging or using the included LiPo battery you assume all risks associated with LiPo batteries. If you do not agree with these conditions please return the complete product in new, unused condition to the place of purchase immediately.

You must always charge the LiPo battery in a safe, well-ventilated area away from flammable materials.
Never charge the LiPo battery unattended at any time. When charging the battery you must always remain in constant observation to monitor the charging process and react immediately to any potential problems that may occur.
After flying/discharging the LiPo battery you must allow it to cool to ambient/room temperature before recharging.
To charge the LiPo battery you must use only the included charger or a suitably compatible LiPo battery charger. Failure to do so may result in a fire causing property damage and/or serious injury.
If at any time the LiPo battery begins to balloon or swell, discontinue charging or discharging immediately. Quickly and safely disconnect the battery, then place it in a safe, open area away from flammable materials to observe it for at least 15 minutes. Continuing to charge or discharge a battery that has begun to balloon or swell can result in a fire. A battery that has ballooned or swollen even a small amount must be removed from service completely.
Do not over-discharge the LiPo battery. Discharging the battery too low can cause damage to the battery resulting in reduced power, flight duration or failure of the battery entirely. LiPo cells should not be discharged to below 3.0V each under load.
Store the LiPo battery at room temperature and in a dry area for best results.
When charging, transporting or temporarily storing the LiPo battery the temperature range should be from approximately 40–120° F (5–49° C). Do not store the battery or aircraft in a hot garage, car or direct sunlight. If stored in a hot garage or car the battery can be damaged or even catch fire.
Never leave batteries, chargers and power supplies unattended during use.
Never attempt to charge low voltage, ballooned/swollen, damaged or wet batteries.
Never allow children under 14 years of age to charge batteries.
Never charge a battery if any of the wire leads have been damaged or shorted.
Never attempt to disassemble the battery, charger or power supply.
Never drop batteries, chargers or power supplies.
Always inspect the battery, charger and power supply before charging.
Always ensure correct polarity before connecting batteries, chargers and power supplies.
Always disconnect the battery after charging.
Always terminate all processes if the battery, charger or power supply malfunctions.

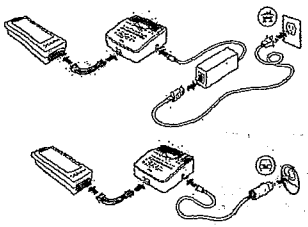
TYPHOON QUICK START GUIDE

IMPORTANT NOTE:

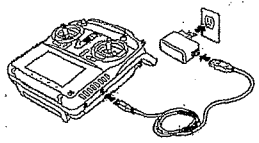
This Quick Start Guide is NOT intended to replace the content included in the instruction manual. You should read the instruction manual completely before proceeding.

1 Charge the Batteries

Power the SC3500-3 charger from a 100-240V AC outlet using the AC adapter/power supply, or from a 12V DC accessory socket/cigarette lighter receptacle in a vehicle using the included adapter.

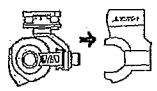


A green blinking LED indicates the charger is powered on and ready to charge, and a red blinking LED indicates the battery is charging. It will take approximately 2 hours to charge a fully discharged (not over-discharged) battery.

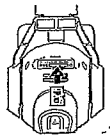


WARNING: All instructions and warnings must be followed exactly to prevent property damage and/or serious injury as the mishandling of LiIon/LiPo batteries can result in fire.

2 Prepare the CGO2-GB



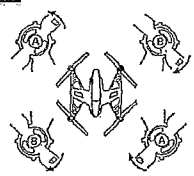
2.1 Remove the cover/lock from the rear of the CGO2-GB by carefully sliding it backward.



2.2 Insert the included 8GB card or any Class 10 microSD card from 4GB to 128GB.

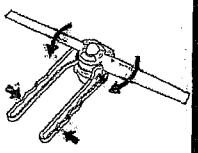
2.3 Carefully remove the protective material from the camera lens.

3 Install the Propellers



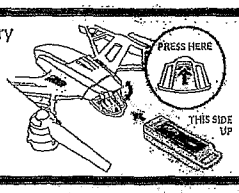
CAUTION: Do not over-tighten the propellers when using the tool.

Install the corresponding A and B propellers in the positions shown by rotating them per the illustration and until they're secure. It may also be helpful to use the included tool to hold the motors while installing the propellers.

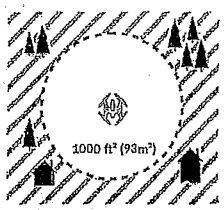


4 Install the Battery

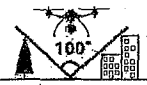
NOTE: If the door will not close the battery is not inserted far enough to engage the connector properly.



5 Placement before Takeoff

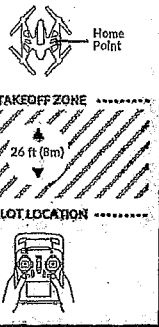


WARNING: Always operate the Q500 in open areas (approximately 1000 square feet/93 square meters or more) that are free from people, vehicles, trees and other obstructions. Never fly near or above crowds, airports or buildings.



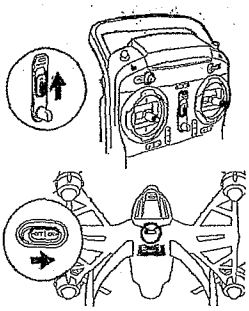
Never attempt to operate the Q500 nearby tall buildings/obstructions that do not offer a clear view of the sky (a minimum clearance of 100').

WARNING: The home point/position is set when the motors are started. When the home point is set the Q500 must be approximately 26 feet (8 meters) from where the pilot will stand AND the front of the aircraft MUST be pointed away from the pilot. If the Q500 is pointed in any other direction the controls will not function properly relative to your position when flying in Smart Mode which may result in personal injury or damage to property. Once the motors are started you must NOT change your position except to rotate in place so you are always facing the Q500.



6 Powering ON/OFF

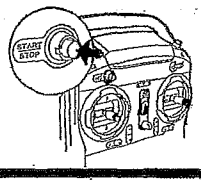
ALWAYS turn the ST10 on and allow it to boot up BEFORE turning the Q500 on (and ALWAYS turn the Q500 off BEFORE turning off the ST10).



Place the Q500 on a level and stable surface then slide the switch to the 'ON' position. DO NOT TOUCH OR MOVE THE Q500 UNTIL THE INITIALIZATION PROCESS IS COMPLETE. The main LED status indicator will glow solid green (Smart Mode) or solid purple (Angle/Pilot Mode) when initialization is complete.

7 Starting/Stopping the Motors

Step back approximately 26 feet (8 meters) behind the Q500. Press and hold the red START/STOP button for approximately three (3) seconds to start the motors. Press and hold the button for approximately two (2) seconds to stop the motors.



8 Flight Controls:

NOTE: The information in this and the following steps refers to the default 'Mode 2' control configuration of the ST10.

When the left-hand stick is in the middle position the Q500 will maintain the current altitude. The farther away from the middle position you move the stick the faster the Q500 will climb or descend. Moving the stick to the left/right will turn (yaw) the nose of the Q500 left/right about the vertical axis.

TAKEOFF

WARNING: Do not attempt to operate the Q500 in winds that exceed 8-12 miles per hour (13-19 kilometers per hour).

To takeoff, slowly raise the left-hand stick to slightly above the center position. The Q500 will takeoff and climb slowly (or raise the stick further until it does). Allow the stick to return to the center position when the Q500 reaches the desired altitude.

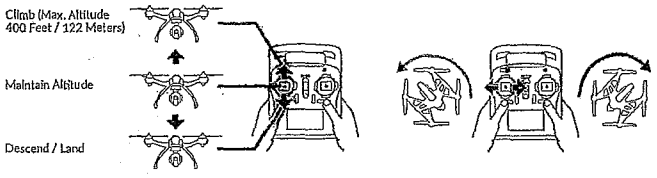
LANDING

There are two ways to land the Q500:

1) Position the Q500 above the area where you would like to land. Slowly lower the left-hand stick to below the center position. The Q500 will descend slowly and land. After the Q500 lands, press and hold the red START/STOP button for approximately one (1) second to stop the motors.

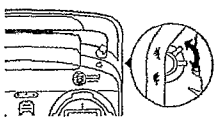
2) Activate Home Mode and the Q500 will automatically fly itself back to the home point and will land within a 10 foot (3 meter) diameter circle around it.

WARNING: Always land as soon as possible after the first level low voltage battery warning, or land immediately after the second level low voltage battery warning (as indicated by the vibrations and audible alerts from the ST10). And if at any time the Aircraft Battery Voltage shown on the screen is below 10.7V, land the Q500 immediately.



9 Proportional Control Rate Slider

Sets the overall climb/descend and directional control rates. Use the turtle position for the lowest control rates (best for first-time pilots and when flying between 5000 feet and 8000 feet Above Mean Sea Level). Use the rabbit position for the highest control rates (best for experienced pilots and only when flying below 5000 feet AMSL.



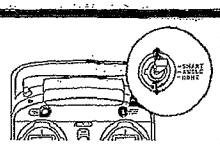
10 Selecting a Flight Mode

The Q500 is programmed with three (3) flight modes that can be selected via the Flight Mode Selection Switch located just above the right-hand control stick.

1) When the flight mode switch is in the top position the Q500 will be in Smart Mode.

2) When the flight mode switch is in the middle position the Q500 will be in Angle (also known as Pilot) Mode.

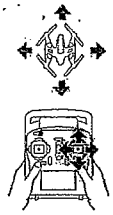
3) When the flight mode switch is in the lowest position the Q500 will be in Home Mode.



11 Flight Modes

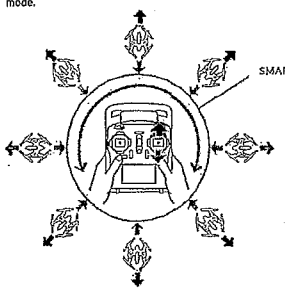
ANGLE (PILOT) MODE

When the main LED status indicator glows solid purple the Q500 is in Angle (Pilot) Mode which is intended for intermediate/experienced pilots. The Q500 will move in the direction the right-hand control stick is pushed relative to the front/nose of the aircraft (and the 'angle' of movement is determined by how far you move the stick away from the center position).



SMART MODE

When the main LED status indicator glows solid green the Q500 is in Smart Mode which is intended for beginner/first-time pilots. The Q500 will always move in the direction the right-hand control stick is pushed relative to the pilot and no matter which way the front/nose is pointed. And you should never change your position after takeoff but you should rotate in place so you are ALWAYS facing the Q500 (as indicated by the red arrows). Also, the Q500 cannot be flown more than 300 feet (91 meters) away from the home point in this mode.

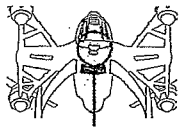


*Ø 52 feet / 16 meters

HOME MODE

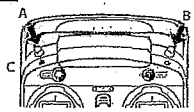
When the main LED status indicator flashes red the Q500 is in Home Mode. In this mode the Q500 will automatically fly itself back to the home point and will land within a 10 feet (3 meter) diameter circle around it.

WARNING: If the Q500 loses GPS signal/lock while flying the LEDs under the motors will flash three (3) times per second then will go off for one (1) second, the GPS status on the ST10 screen will be listed as 'Disabled' and the Q500 will switch to Angle (Pilot) Mode automatically. Smart Mode and Home Mode will not work and you must be able to properly control the Q500 in Angle (Pilot) Mode otherwise it may crash or even 'fly away'.

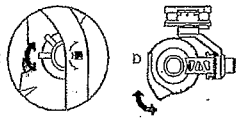


MAIN LED STATUS INDICATOR

12 Camera Controls



Take Still Photo = Button A
Start/Stop Recording Video = Button B



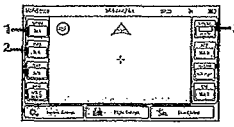
Use the slider (C) on the left side of the ST10 to set the pitch/tilt position (D) of the CGO2-GB.

CAUTION: You MUST stop recording video in order to take still photos. It will take approximately 5 seconds to capture a still photo and before you can take another.

CAUTION: ALWAYS stop recording video before turning off the Q500/CGO2-GB to avoid data loss. If you accidentally turn off the Q500/CGO2-GB before you stop recording, re-insert microSDcard (if removed) and turn the system on again. Wait approximately 20 seconds until the camera LED starts to glow solid green indicating the last video file was recovered.

IMPORTANT NOTE: You can choose to record video at 48, 50 or 60 frames per second by tapping the corresponding button near the upper left-hand corner on the screen of the ST10. And the delay in the live video stream will be lowest at 48 frames per second.

13 ST10 Display



Double tap the center of the screen to increase the size of the video viewing area.

WARNING: NEVER attempt to fly the Q500 via First-Person View (FPV). Attempting to fly via FPV can result in a crash that will cause damage to the product, property and/or cause serious injury.

1) Flight Mode of Aircraft 2) GPS Status for Aircraft 3) Aircraft Battery Voltage

IMPORTANT NOTE:

After flying, turn off the Q500 BEFORE turning off the ST10. Then remove the battery from the Q500 and allow it to cool to ambient/room temperature before recharging.

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