



U.S. Department  
of Transportation

**Federal Aviation  
Administration**

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

June 15, 2015

Exemption No. 11817  
Regulatory Docket No. FAA-2015-1095

Mr. Zachary Jacobs  
Waking Sky LLC  
16844 68th Street North  
Loxahatchee, FL 33470

Dear Mr. Jacobs:

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 15, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Waking Sky LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography for motion picture, television, and commercial video industry.

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

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

### Airworthiness Certification

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

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

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

## Conditions and Limitations

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

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

1. Operations authorized by this grant of exemption are limited to the DJI Phantom 2 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](http://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 June 30, 2017, unless sooner superseded or rescinded.

Sincerely,

/s/

John S. Duncan  
Director, Flight Standards Service

Enclosures

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April 15, 2015

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

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

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the Reform Act) and 14 C.F.R. Part 11, Waking Sky, developer and operator of Small Unmanned Aircraft Systems (“sUASs”) equipped to conduct aerial photography for the motion picture, television and commercial video industry, hereby applies for an exemption from the listed Federal Aviation Regulations (“FARs”) to allow commercial operation of its sUASs, so long as such operations are conducted within and under the conditions outlined herein or as may be established by the FAA as required by Section 333.

As described more fully below, the requested exemption would permit the operation of small, unmanned and relatively inexpensive sUAS under controlled conditions in airspace that is 1) limited 2) predetermined 3) controlled as to access and 4) would provide safety enhancements to the already safe operations in the film and television industry presently using conventional aircraft. Approval of this exemption would thereby enhance safety and fulfill the Secretary of Transportation’s (the FAA Administrator’s) responsibilities to “...establish requirements for the safe operation of such aircraft systems in the national airspace system.” Section 333(c) of the Reform Act.

The name and address of the applicant is:

Waking Sky LLC  
Attn: Zachary Jacobs  
Ph: 217-454-3755

Email: [Zach@wakingsky.com](mailto:Zach@wakingsky.com)

Address: 16844 68th st N, Loxahatchee, FL 33470

Regulations from which the exemption is requested:

- 14 CFR Part 21
- 14 C.F.R. 45.23(b)
- 14 CFR 61.113 (a) & (b)
- 14 C.F.R. 91.7 (a)
- 14 CFR 91.9 (b) (2)
- 14 C.F.R. 91.103
- 14 C.F.R. 91.109
- 14 C.F. R. 91.119
- 14 C.F.R. 91.121
- 14 CFR 91.151 (a)
- 14 CFR 91.203 (a) & (b)
- 14 CFR 91.405 (a)
- 14 CFR 407 (a) (1)
- 14 CFR 409 (a) (2)
- 14 CFR 417 (a) & (b)

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

- The UAS's size, weight, speed, and operational capability;
- Operation of the UAS in close proximity to airports and populated
- Operation of the UAS within visual line of sight of the operator.

Reform Act § 333 (a). Lastly, if the Secretary determines that such vehicles "may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft in the national airspace system." Id. §333(c) (emphasis added)<sup>A</sup>

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<sup>A</sup> Applicant interprets this provision to place the duty on the Administrator to not only process applications for exemptions under section 333, but for the Administrator to craft conditions for the safe operation of the UAS, if it should be determined that the conditions set forth herein do not fulfill the statutory requirements for approval.

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

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

Waking Sky LLC's sUASs are rotorcraft, weighting 55 or fewer lbs. including payload. They operate, under normal conditions at a speed of no more than 50 knots and have the capability to hover, and move in the vertical and horizontal plane simultaneously. They will operate only in line of sight and will operate only within the sterile area described in the Flight Safety Manual, attached as Exhibit B (hereinafter "the Manual"). Such operations will insure that the sUAS will "not create a hazard to users of the national airspace system or the public." <sup>B</sup>

Given the small size of the sUASs involved and the restricted sterile environment within which they will operate, the applicant falls squarely within that zone of safety (an equivalent level of safety) in which Congress envisioned that the FAA must, by exemption, allow commercial operations of UASs to commence immediately. Also due to the size of the UASs and the restricted areas in which the relevant sUASs will operate, approval of the application presents no national security issue. Given the clear direction in Section 333 of the Reform Act, the authority contained in the Federal Aviation Act, as amended; the strong equivalent level of safety surrounding the proposed operations, and the significant public benefit, including enhanced safety, reduction in environmental impacts, including reduced emissions associated with allowing UASs for movie and television operations, the grant of the requested exemptions is in the public interest. Accordingly, the applicant respectfully requests that the FAA grant the requested exemption without delay.

## AIRCRAFT AND EQUIVALENT LEVEL OF SAFETY

The applicant proposes that the exemption requested herein apply to civil aircraft that have the characteristics and that operate with the limitations listed herein. These limitations provide for at least an equivalent or even higher level of safety to operations under the current regulatory structure because the proposed operations represent a safety enhancement to the already safe movie and television filming operations conducted with conventional aircraft.

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<sup>B</sup> Reform Act Section 333 (b).

These limitations and conditions to which Waking Sky LLC agrees to be bound when conducting commercial operations under an FAA issued exemption include:

1. The sUAS will weigh less than 55 lbs.
2. Flights will be operated within line of sight of a pilot and/or observer.
3. Maximum total flight time for each operational flight will be 20 minutes. Flights will be terminated at 25% battery power reserve should that occur prior to the 25 minute limit.
4. Flights will be operated at an altitude of no more than 400 feet AGL or, not more than 200 feet above an elevated platform from which filming is planned.
5. Minimum crew for each operation will consist of the sUAS Pilot, the Visual Observer, and the Camera Operator.
6. sUAS pilot will be an FAA licensed airman with at least a private pilot's certificate and third class medical. The observer will hold at least a third class medical.
7. sUAS Pilot will be Pilot in Command (PIC).
8. The UAS will only operate within a confined "Sterile Area" as defined in the Manual. Section C of the Manual requires the establishment of a "Security Perimeter" for the flight operations area.
9. A briefing will be conducted in regard to the planned sUAS operations prior to each day's production activities. It will be mandatory that all personnel who will be performing duties within the boundaries of the safety perimeter be present for this briefing.
10. The operator will file a FAA Form 7711-1, or its equivalent, as modified in light of the requested exemption, with the appropriate Flight Standards District Office.
11. The operator will obtain the consent of all persons involved in the filming and ensure that only consenting persons will be allowed within 100 feet of the flight operation, and this radius may be reduced to 30 feet based upon an equivalent level of safety determination, as required by Section F of the Manual. With the advanced permission of the relevant FSDO, operations at closer range can be approved. (See Section B in the Manual Appendix B)
12. The operator will submit a written Plan of Activities to the FSDO three days before the proposed shoot as required in Section C of the Manual.
13. Pilot and observer will have been trained in operation of UAS generally and received up-to-date information on the particular UAS to be operated as required Sections G of the Manual.
14. Observer and pilot will at all times be able to communicate by voice.
15. Written and/or oral permission from the relevant property holders will be obtained.
16. 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.
17. If the sUAS loses communications or loses its GPS signal, the UAS will have capability to return to a pre-determined location within the Security Perimeter and land.
18. The sUAS will have the capability to abort a flight in case of unpredicted obstacles or emergencies.

## **14 C.F.R. Part 21, Subpart H: Airworthiness Certificates 14 C.F.R. §91.203 (a) (1)**

Subpart H, entitled Airworthiness Certificates, establishes the procedural requirements for the issuance of airworthiness certificates as required by FAR §91.203 (a) (1). Given the size and limited operating area associated with the aircraft to be utilized by the Applicant, an exemption from Part 21 Subpart H meets the requirements of an equivalent level of safety under Part 11 and Section 333 of the Reform Act. The Federal Aviation Act (49 U.S.C. §44701 (f)) and Section 333 of the Reform Act both authorize the FAA to exempt aircraft from the requirement for an airworthiness certificate, upon consideration of the size, weight, speed, operational capability, and proximity to airports and populated areas of the particular UAS. In all cases, an analysis of these criteria demonstrates that the UAS operated without an airworthiness certificate, in the restricted environment and under the conditions proposed will be at least as safe, or safer, than a conventional aircraft (fixed wing or rotorcraft) operating with an airworthiness certificate without the restrictions and conditions proposed.

The sUAS to be operated hereunder is less than 55 lbs. fully loaded, carries neither a pilot nor passenger, carries no explosive materials or flammable liquid fuels, and operates exclusively within a secured area as set out in the Manual. Unlike other civil aircraft, operations under this exemption will be tightly controlled and monitored by both the operator, pursuant to the Manual's requirements, and under the requirements and in compliance with local public safety requirements, to provide security for the area of operation as is now done with conventional filming. The FAA will have advance notice of all operations. These safety enhancements, which already apply to civil aircraft operated in connection with motion picture and television production, provide a greater degree of safety to the public and property owners than conventional operations conducted with airworthiness certificates issued under 14 C.F.R. Part 21, Subpart H. Lastly, application of these same criteria demonstrates that there is no credible threat to national security posed by the UAS, due to its size, speed of operation, location of operation, lack of explosive materials or flammable liquid fuels, and inability to carry a substantial external load.

## **14 C.F.R. § 45.23 (b). Marking of the Aircraft**

The regulation requires:

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

Even though the UAS will have no airworthiness certificate, an exemption may be needed as the UAS will have no entrance to the cabin, cockpit or pilot station on which the word “Experimental” can be placed. Given the size of the sUAV, two-inch lettering will be impossible. The word “Experimental” will be placed on the fuselage in compliance with §45.29 (f).

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

#### **14 C.F.R. § 61.113 (a) & (b): Private Pilot Privileges and Limitations: Pilot in Command.**

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

#### **14 C.F.R. §91.7(a): Civil aircraft airworthiness.**

The regulation requires that no person may operate a civil aircraft unless it is in airworthy condition. As there will be no airworthiness certificate issued for the aircraft, should this exemption be granted, no FAA regulatory standard will exist for determining airworthiness. Given the size of the aircraft and the requirements contained in the Manual for maintenance and use of safety check lists prior to each flight, as set forth in Sections C & D, an equivalent level of safety will be provided.

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

Section 91.9 (b) (2) provides:

No person may operate a U.S.-registered civil aircraft ...

(2) For which an Airplane or Rotorcraft Flight Manual is not required by §21.5 of this chapter, unless there is available in the aircraft a current approved airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof.

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

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

#### **14 C.F.R. § 91.103: Preflight action**

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

#### **14 C.F.R. §91.109: Flight instruction:**

Section 91.103 provides that no person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls.

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

Safe simulation and practice flight will be carried out in controlled environments. All simulations will be carried out on a computer using the drone controls. Any practice flying will take place in a safe environment, with no risk to human life below.

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

Section 91.119 establishes safe altitudes for operation of civil aircraft. Section 91.119 (d) allows helicopters to be operated at less than the minimums prescribed, provided the person operating the helicopter complies with any route or altitudes prescribed for helicopters by the FAA. As this exemption is for a sUAS that is a helicopter and the exemption requests authority to operate at altitudes up to 400 AGL, or not more than 200 above an elevated platform from which filming is planned, an exemption may be needed to allow such operations. As set forth herein, except for the limited conditions stated in the Manual, the UAS will never operate at higher than 400 AGL. It will however be operated in a restricted area with security perimeter, where buildings and people will not be exposed to operations without their pre-obtained consent.

The equivalent level of safety will be achieved given the size, weight, speed of the UAS as well as the location where it is operated. No flight will be taken without the permission of the property owner or local officials. Because of the advance notice to the property owner and participants in the filming activity, all affected individuals will be aware of the planned flight operations as set forth in Section C of the Manual. Compared to flight operations with aircraft or rotorcraft weighing far more than the maximum 55lbs. proposed herein and the lack of flammable fuel, any risk associated with these operations is far less than those presently presented with conventional aircraft operating at or below 500 AGL in the movie industry. In addition, the low-altitude operations of the sUAS will ensure separation between these small-UAS operations and the operations of conventional aircraft that must comply with Section 91.119.

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

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

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

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

The battery powering the sUAS provides approximately 40 minutes of powered flight. To meet the 30 minute reserve requirement in 14 CFR §91.151, sUAS flights would be limited to

approximately 10 minutes in length. Given the limitations on the UAS's proposed flight area and the location of its proposed operations within a predetermined area, a longer time frame for flight in daylight or night VFR conditions is reasonable.

Applicant believes that an exemption from 14 CFR §91.151(a) falls within the scope of prior exemptions. See Exemption 10673 (allowing Lockheed Martin Corporation to operate without compliance with FAR 91.151 (a)). Operating the small UAS, in a tightly controlled area where only people and property owners or official representatives who have signed waivers will be allowed, with less than 30 minutes of reserve fuel, does not engender the type of risks that Section 91.151(a) was intended to alleviate given the size and speed of the small UAS. Additionally, limiting sUAS flights to 10 minutes would greatly reduce the utility for which the exemption will be granted.

Applicant believes that an equivalent level of safety can be achieved by limiting flights to 25 minutes or 25% of battery power whichever happens first. This restriction would be more than adequate to return the sUAS to its planned landing zone from anywhere in its limited operating area.

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

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

The regulation provides in pertinent part:

- (a) Except as provided in § 91.715, no person may operate a civil aircraft unless it has within it the following:
  - (1) An appropriate and current airworthiness certificate. . . .
  - (b) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under §91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

The UAS fully loaded weighs no more than 55 lbs and is operated without an onboard pilot. As such, there is no ability or place to carry certification and registration documents or to display them on the sUAS.

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

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

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

Given that these section and Part 43 apply only to aircraft with an airworthiness certificate, these sections will not apply to the applicant. Maintenance will be accomplished by the operator pursuant to the flight manual and operating handbook as referenced in the Manual.(See Sections B, D and G) An equivalent level of safety will be achieved because these small UASs are very limited in size and will carry a small payload and operate only in restricted areas for limited periods of time. If mechanical issues arise the UAS can land immediately and will be operating from no higher than 400 feet AGL. As provided in the Manual, the operator will ensure that the UAS is in working order prior to initiating flight, perform required maintenance, and keep a log of any maintenance performed. Moreover, the operator is the person most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition to provide the equivalent level of safety.

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:

Applicant seeks an exemption from the following rules:

14 C.F.R. §21, subpart H; 14 C.F.R 45.23(b);14 C.F.R. §§ 61.113(a) & (b);91.7 (a); 91.9 (b) (2);91.103(b);91.109; 91.119; 91.121; 91.151(a);91.203(a) and (b); 91.405 (a); 91.407 (a) (1); 91.409 (a) (2); 91.409 (a) (2) and 91.417 (a) & (b) to operate commercially a small unmanned vehicle (55lbs or less) in motion picture and television operations.

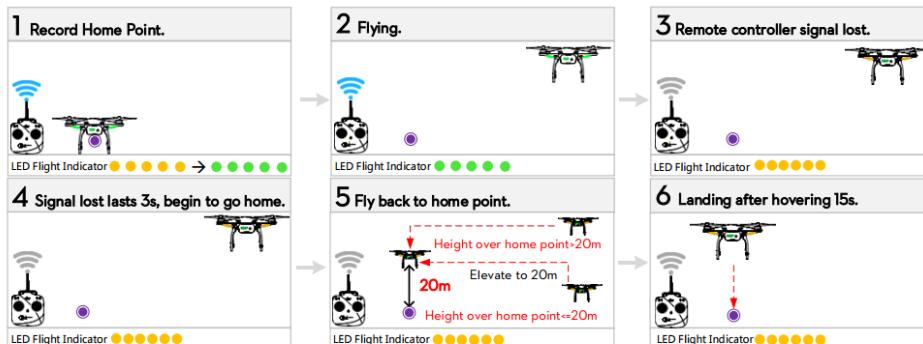
Approval of exemptions allowing commercial operations of sUASs in the film industry will enhance safety by reducing risk. Conventional film operations, using jet or piston power aircraft, operate at extremely low altitudes just feet from the subject being filmed and in extreme proximity to people and structures; and present the risks associated with vehicles that weigh in the neighborhood of 4,000lbs., carrying large amounts of jet A or other fuel (140 gallons for jet helicopters shown below). Such aircraft must fly to and from the film location. In contrast, a sUAS weighing fewer than 55 lbs. and powered by batteries eliminates virtually all of that risk given the reduced mass and lack of combustible fuel carried on board. The sUAS is carried to the film set and not flown. The sUAS will carry no passengers or crew and, therefore, will not expose them to the risks associated with manned aircraft flights.

The operation of small UASs, weighting less than 55 lbs., conducted in the strict conditions outlined above, will provide an equivalent level of safety supporting the grant of the exemptions requested herein, including exempting the applicant from the requirements of Part 21 and allowing commercial operations. These lightweight aircraft operate at slow speeds, close to the ground, and in a sterile environment and, as a result, are far safer than conventional operations conducted with turbine helicopters operating in close proximity to the ground and people.

### **UASs Details: See Appendix B**

#### Safety Features:

- Emergency “Return-To-Home” / One-Key Go-Home
  - At the beginning of each flight a home point is set. This home point is set in accordance with the manual to allow for a safe take-off and return. Should the pilot’s control lose signal with the UAS or manually request a return, the UAS will return to the starting point. (See section 6.4 of the device manual)



- Built in No Fly Zone Database, with no-fly perimeters around all airports.(See Appendix A)

### **Privacy**

All flights will occur over private or controlled access property with the property owner’s prior consent and knowledge. Filming will be of people who have also consented to being filmed or otherwise have agreed to be in the area where filming will take place.

Satisfaction of the criteria provided in Section 333 of the Reform Act of 2012--size, weight, speed, operating capabilities, proximity to airports and populated areas and operation within visual line of sight and national security – provide more than adequate justification for the grant of the requested exemptions allowing commercial operation of applicant’s UAS in the motion picture and television industry pursuant to the Manual appended hereto.

Sincerely



Zachary Jacobs  
Waking Sky LLC  
Co-Founder

## Appendix A: Florida No-Fly Zones

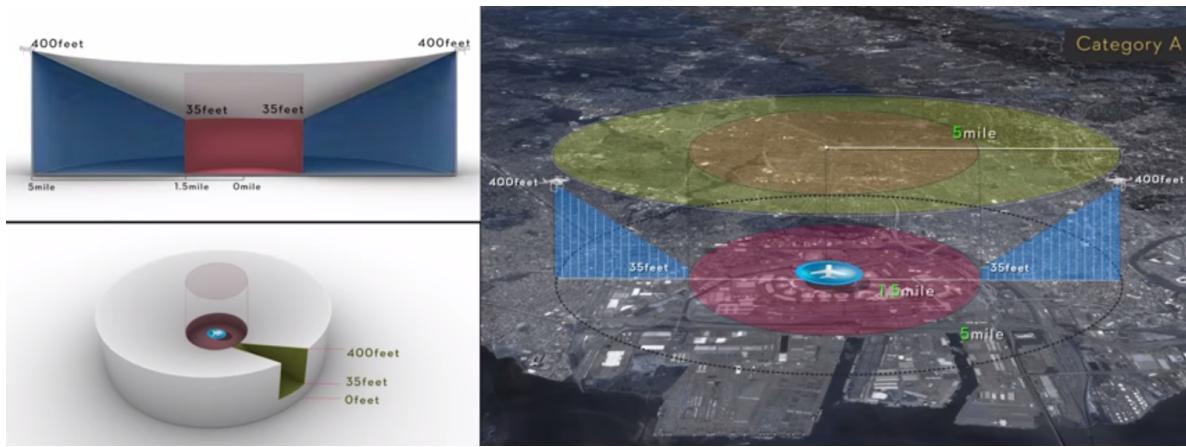
The below no-fly zones are built into the crafts firmware. The No-Fly zones are broken down into 2 categories: red and blue. The red zones are around larger airports and as an added layer of security the UAS cannot take off from within the Red zone (1.5 miles radius). With smaller airports(blue), the UAS will be unable to fly or take off within 0.6mi for the restricted area. Although these zones show areas where the UAS is unable to fly, Waking Sky's Pilots will not operating within 5 nautical miles of any airport.

As a safety precaution, Waking Sky LLC's pilots will not operating within 5 nautical miles of any airport similar to the permission granted in Exemption No. 11153 - Regulatory Docket No. FAA20140519, page 25, "20. *The UA may not operate within 5 nautical miles of an airport reference point as denoted on a current FAA-published aeronautical chart unless a letter of agreement with that airports management is obtained, and the operation is conducted in accordance with a NOTAM as required by the operators COA. The letter of agreement with the airport management must be made available to the Administrator upon request.*"

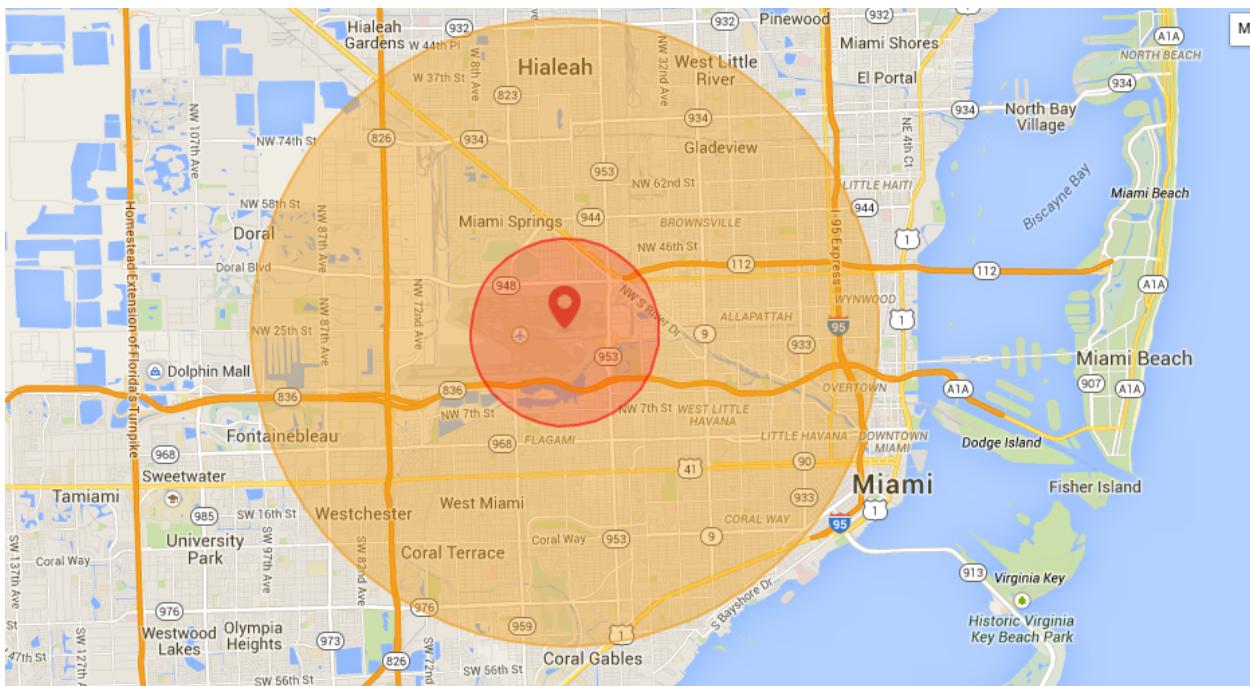
As well as in Exemption No. 11195 - Regulatory Docket No. FAA20140884, page 12, "19. The UA may not operate within 5 nautical miles of an airport reference point as denoted on a current FAA-published aeronautical chart unless a letter of agreement with that airports management is obtained, and the operation is conducted in accordance with a Notice to Airmen (NOTAM), as required by the operators Certificate of Waiver or Authorization (COA). The letter of agreement with the airport management must be made available to the Administrator upon request."

Waking Sky LLC requests the same flexibility as exemptions 11153 and 11195 for acquiring agreement with the airports' management should operations fall within 5 nautical miles of an airport.

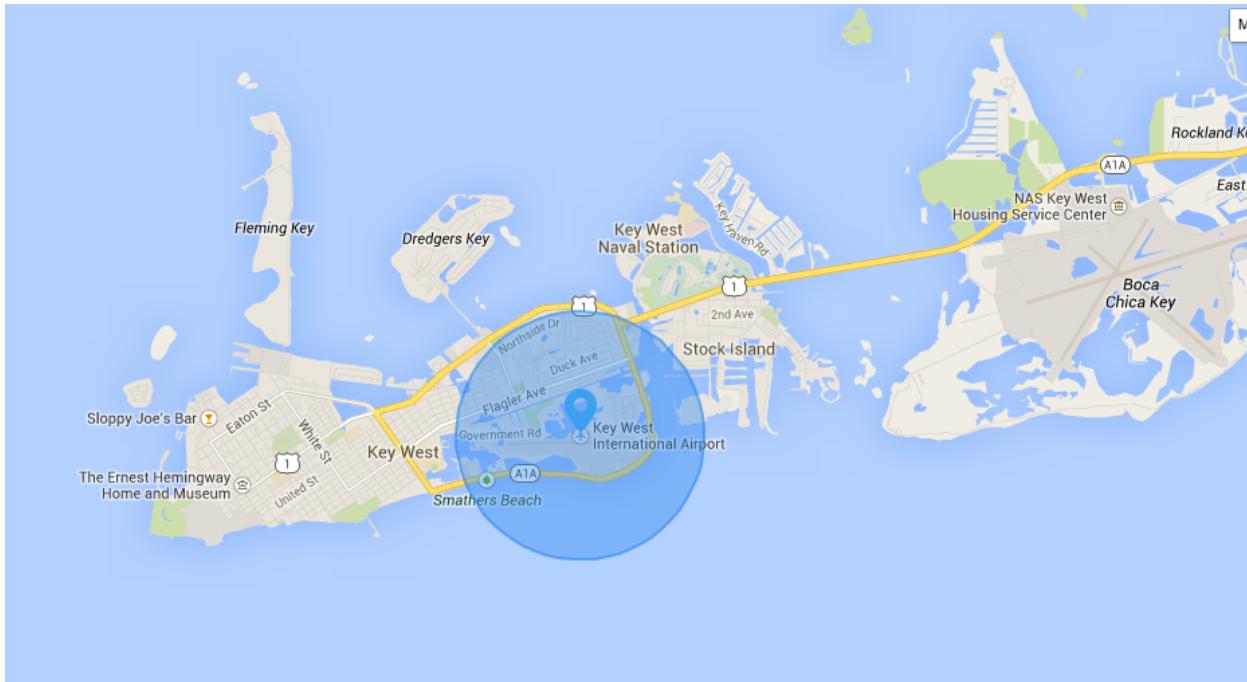
Firmware Restricted Zones



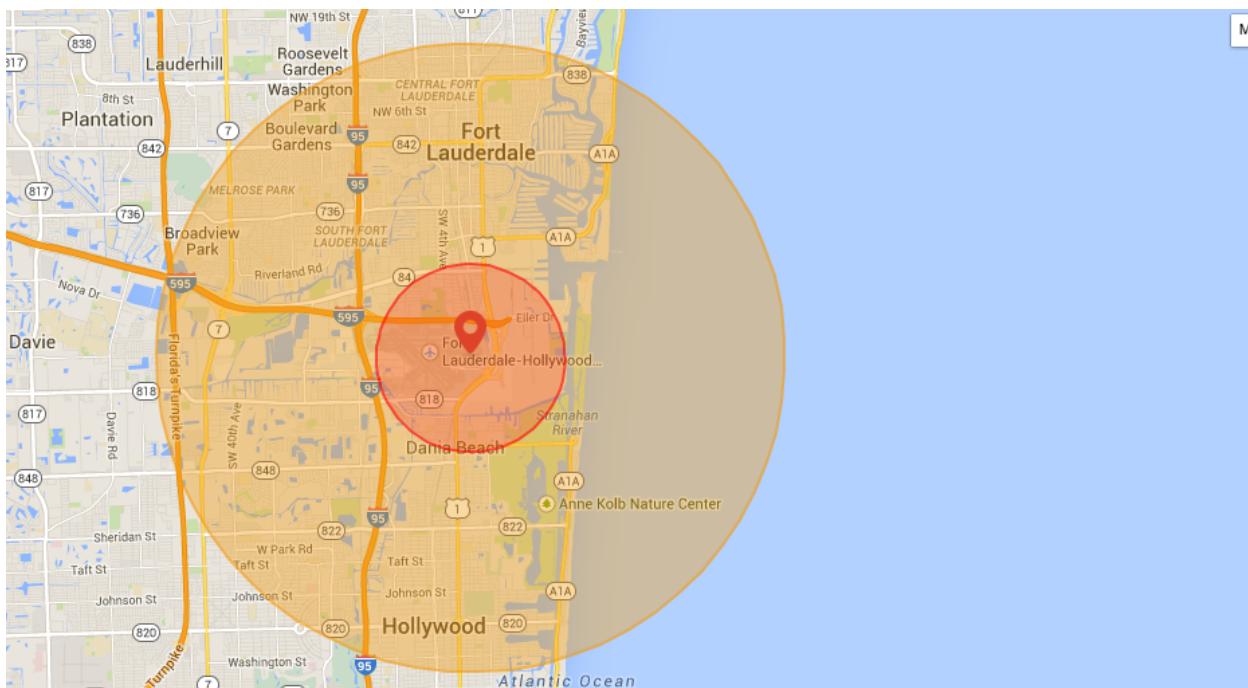
Miami



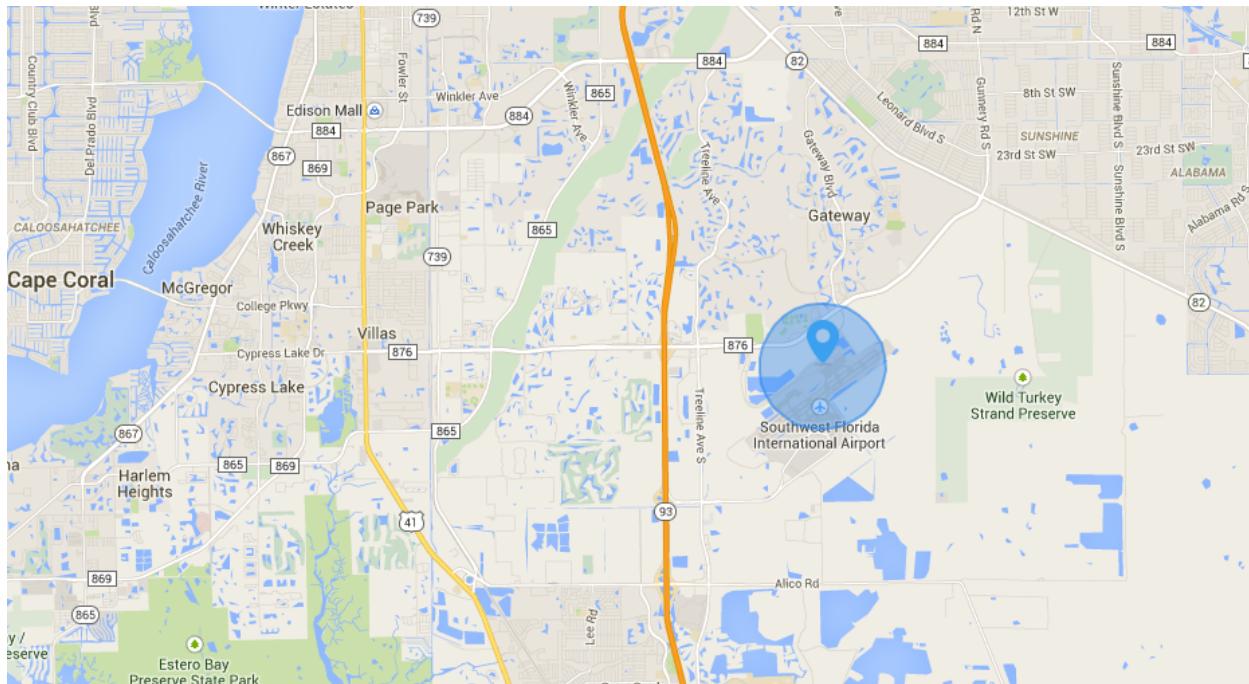
Key West



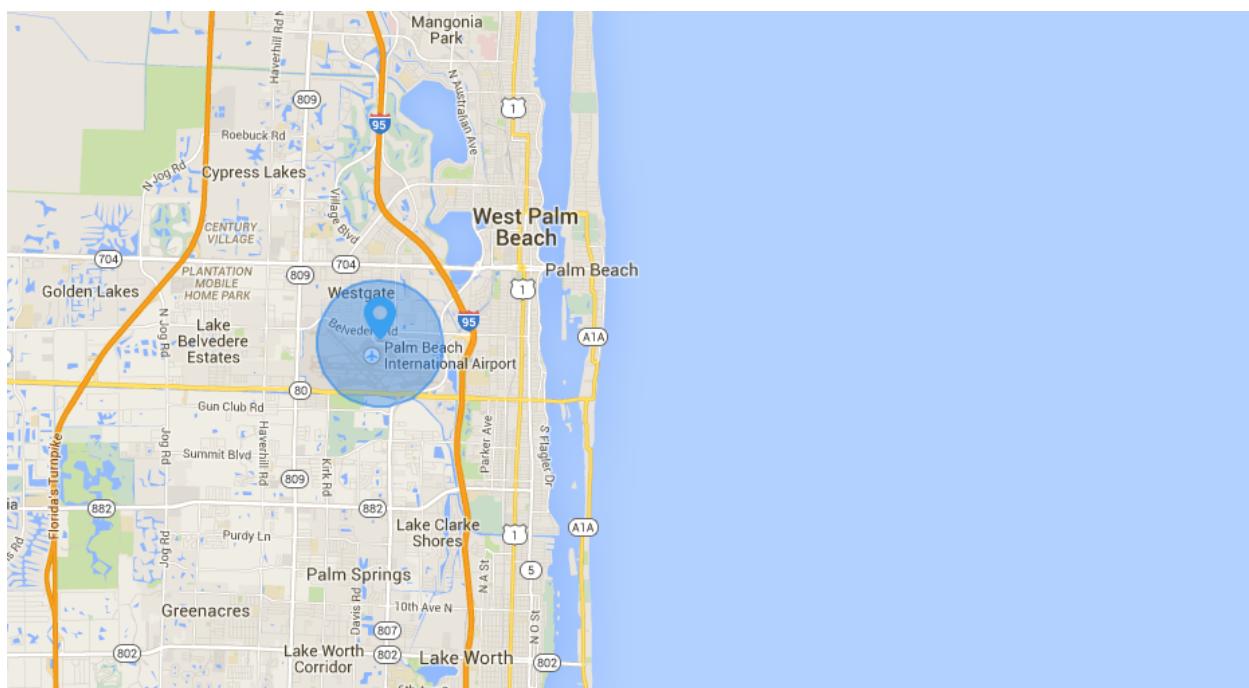
Ft. Lauderdale



Cape Coral

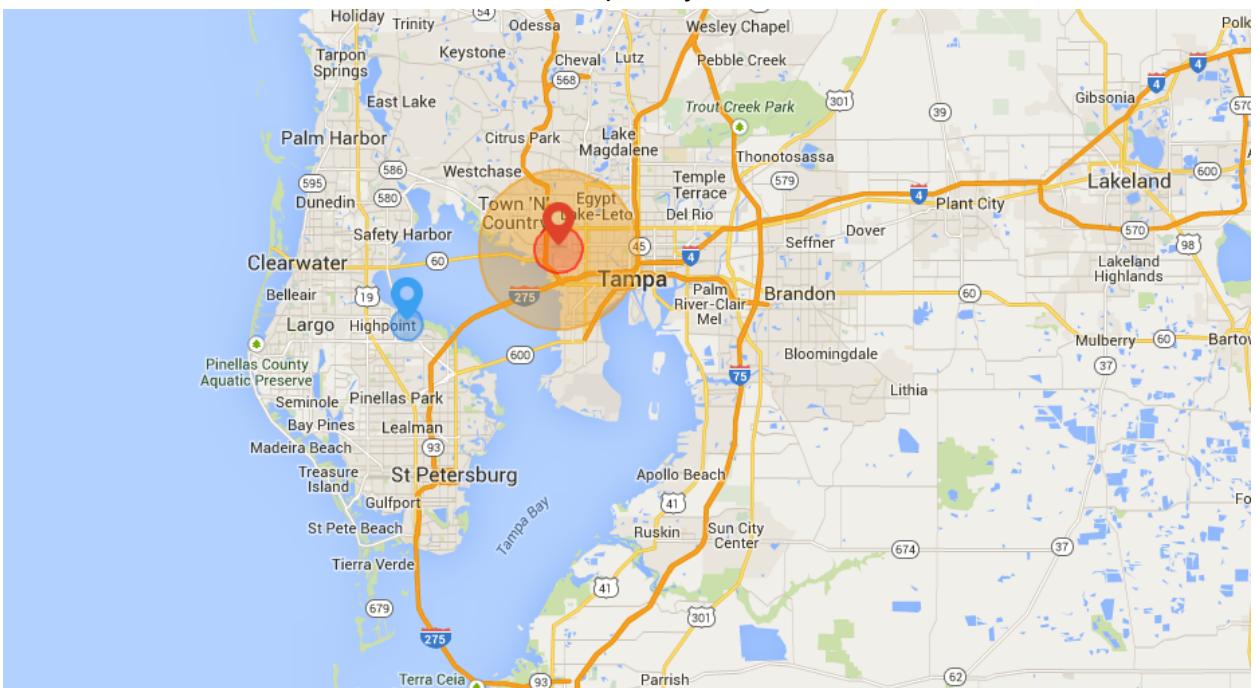


## West Palm Beach

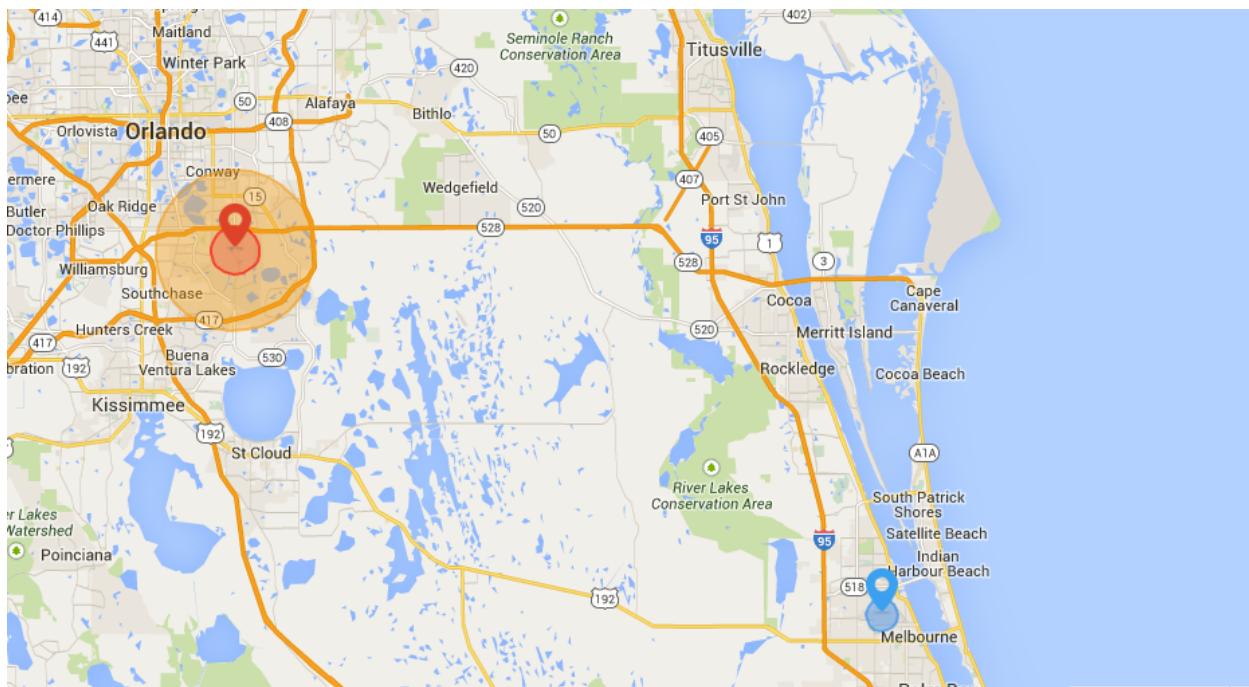


## Sarasota

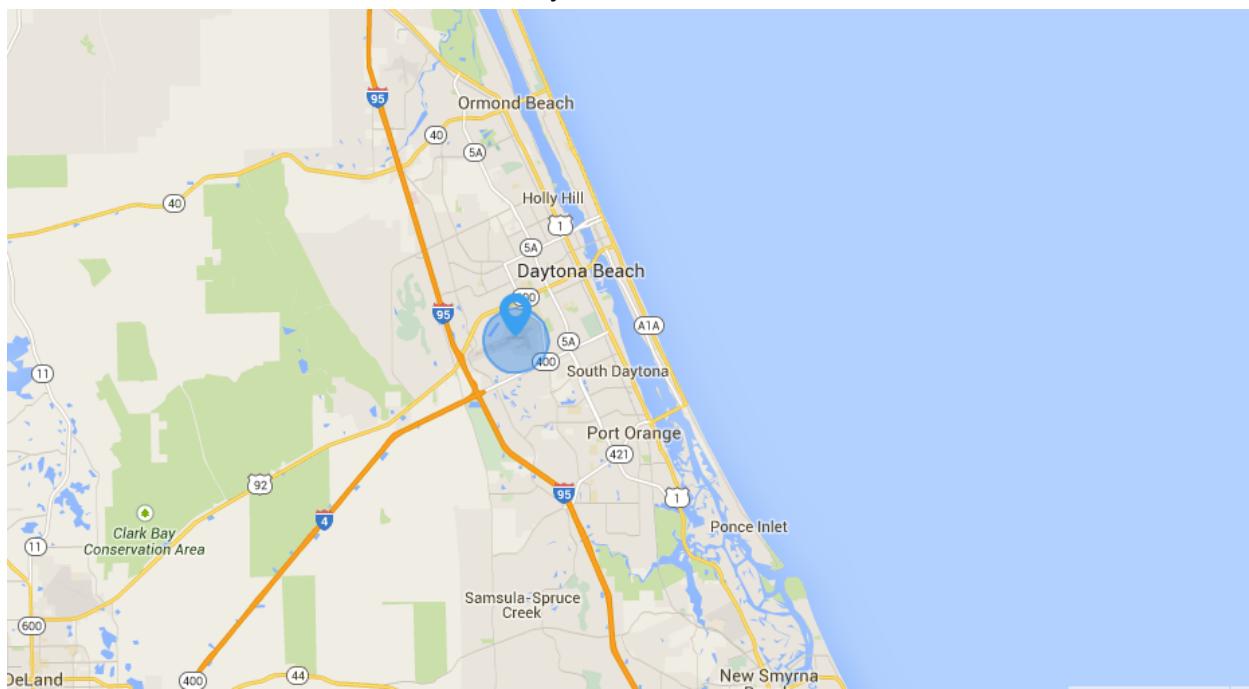
## Tampa Bay



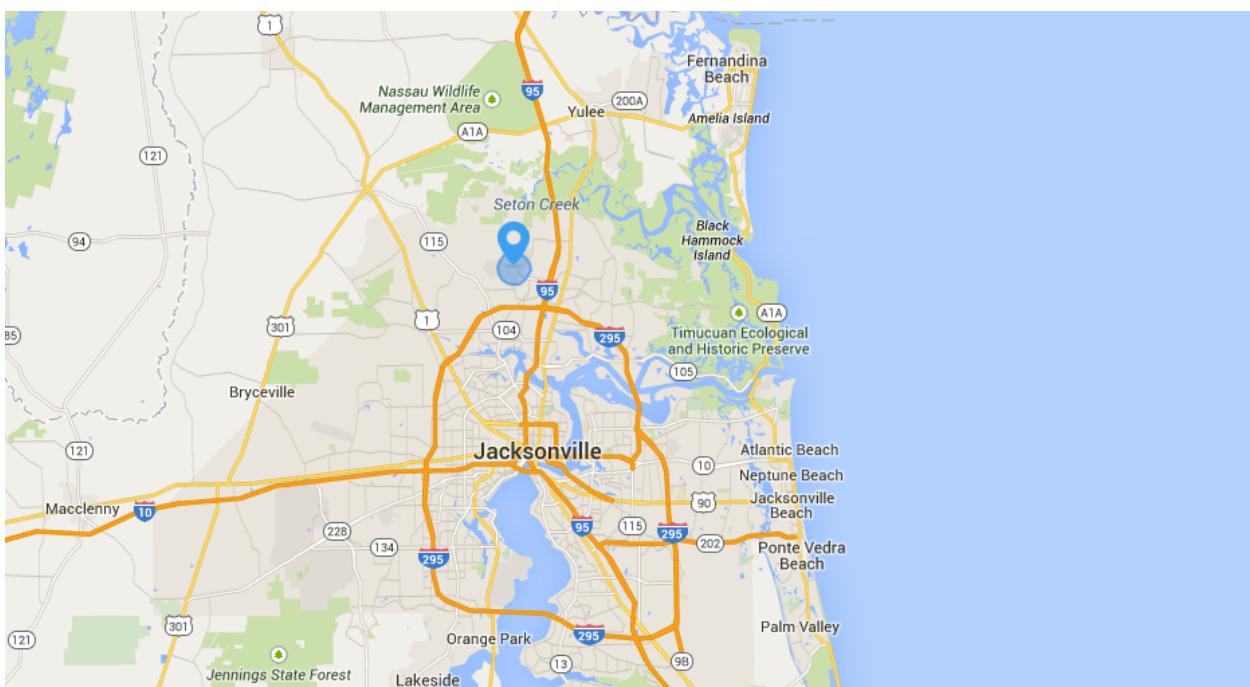
## Orlando/Melbourne



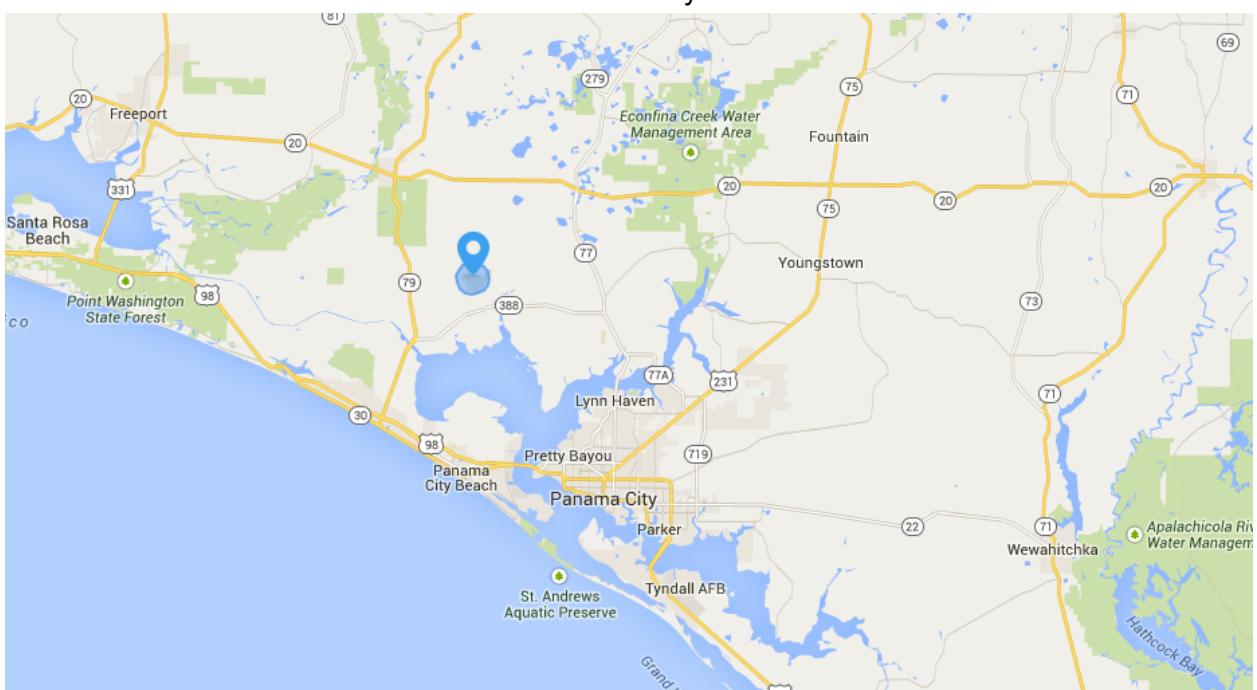
## Daytona Beach



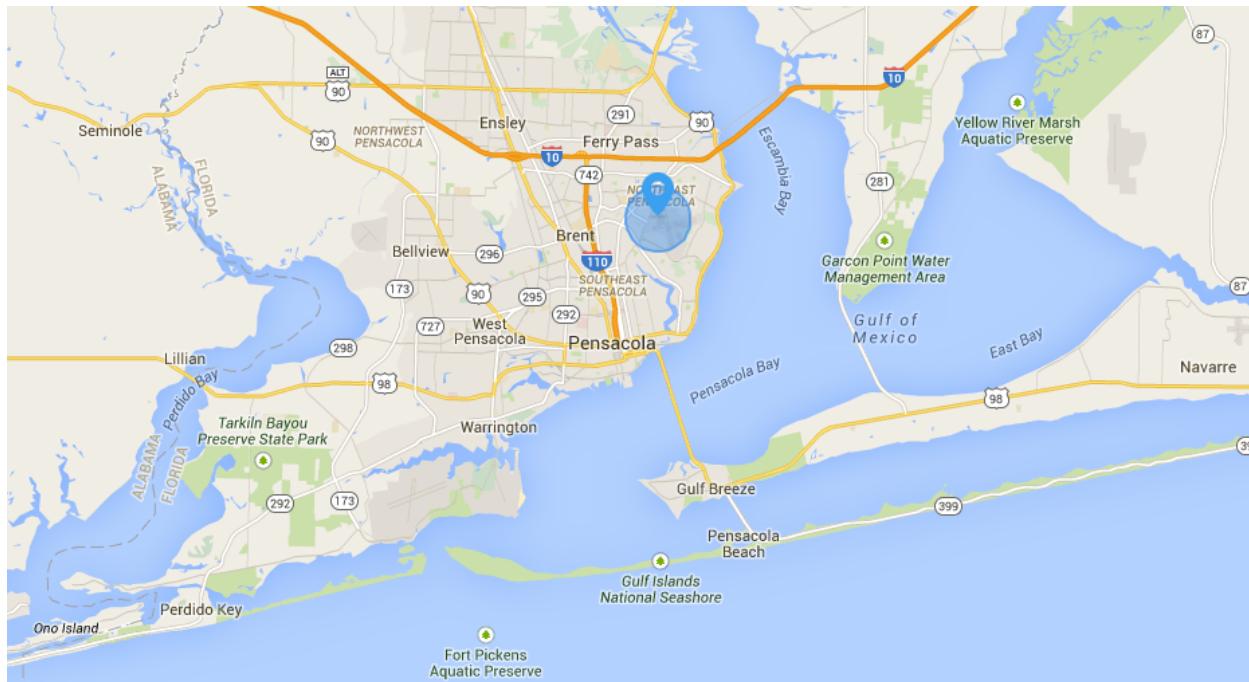
## Jacksonville



## Panama City



## Pensacola



## Appendix B: Safety Manual

### A. Maintenance

- a. The UAS must be inspected by a factory trained technician every 10 flight hours. All maintenance records will be maintained for inspection as set forth in Section B.
- b. If any maintenance is undergone, the UAS must pass a flight test with both a pilot and a manufacturer trained technician before flight.

### B. Record Keeping

- a. A digital record will be kept for all flights, flight times, and maintenance records.

### C. Securing Flight Site

#### a. FSDO Submissions

- i. The UAS operator will file a FAA Form 7711-1, or its equivalent, as modified in light of the requested exemption, with the appropriate Flight Standards District Office.

#### b. Safety Parameter

- i. Before filming occurs, a 100 yard perimeter from the planned flight path will be identified in order to set a “sterile” environment for the operation.
  - 1. Waking Sky LLC must obtain written or oral permission from all landowners in sterile environment.
  - 2. 48 hours before filming, all residents or businesses within 100 yards of the filming will be notified with printed flyers.
    - a. Flyers will contain date of flight, time of flight, and contact information.
  - 3. Streets and sidewalks that cross into the sterile environment will be marked with “Warning Low flying Aircraft - Stay Back 150ft” signs to warn the public.
  - 4. At all times Waking Sky LLC will carry \$1mm in general liability insurance in case of any damage to property or persons within the safety parameter

c. **Identify potential obstacles**

- i. Before each flight, an inventory will be taken for all potential obstacles that must be avoided while in flight. Including:
  - 1. Powerlines
  - 2. Cell Phone Towers
  - 3. Trees
  - 4. Flocks of birds that may take flight
  - 5. Heavily traveled roadways
  - 6. Utility wires
  - 7. Elevated structures
  - 8. At least 5 nautical miles from the nearest airport or helipad.

**D. Pre-Flight Checklist**

a. **Take Off Location/ “Home”**

- i. The UAS will mark its take off location as a safe area to return to should the UAS lose signal with the control or if the pilot signals the craft to return to its “home” location.
  - 1. Take off location will be in an area with a 25ft radius with no obstructions, maintaining said radius vertically 200ft.
  - 2. The UAS will take off and land in the same location.
  - 3. GPS Altimeter will be marked as 0’ elevation

b. **Flight Canceling Events**

- i. All flights will be cancelled for a minimum of 2 hours if any of the below occur:
  - 1. Police activity in the area
  - 2. Low flying aircraft in the area
  - 3. Medical/News Helicopters active in the area
  - 4. Wind exceeding 10 mph
  - 5. Any emergency requiring emergency services occurs within the sterile environment

6. PIC is unable to complete flight without losing visual of the UAS
7. Any precipitation
8. Heavy bird presence in the area that could cause a mid-air collision.
9. Any defects or damage found during preflight exam

**c. Physical Inspection**

- i. Before each flight the UAS will be checked to ensure that it is safe for flight.
  1. Battery voltage will be checked to ensure it is >75%
  2. Blades will be inspected to ensure they are tightened and free of damage
  3. Camera mount and gimbal will be inspected to ensure it is fully attached and operating.
  4. UAS will be checked for any damage that may have taken place in transit.
  5. The UAS will be tested at a low altitude to ensure all controls are responding correctly.
  6. Battery checked for damage that could affect its charge
- ii. If any part of the inspecting shows a damaged part or parts, the UAS is deemed non-useable and must be inspected by a factory trained technician./

**d. Post Flight Inspections/Checklist**

- i. After each flight, the the UAS will be thoroughly inspected for any damage that occurred in flight.
  1. Body inspected for any damage
  2. Blades visually checked for any damage at all
  3. Battery checked for damage

**E. Mid-Air Safety Protocol**

**a. Max Speed**

- i. Accent
  1. 6m/s
- ii. Decent
  1. 2m/s
- iii. Flight Speed
  1. The UAS is never to exceed 10m/s

**b. Altitude**

- i. The UAS is never to exceed 400ft

**c. Emergency**

- i. If it appears that the UAS, any property or humans are at risk, the UAS will be grounded immediately to a safe location.

**d. Sight**

- i. The pilot must keep the UAS within eyesight at all times unassisted by any technology.

**F. Participation by non-pilot staff**

- a. All staff involved in the production or filming using the UAS will consent to maintain a safe distance of at least 30 ft during the filming.

**G. Pilot/Spotter Training**

- a. Before flying, both the Pilot and spotter will receive updated information on the UAS and its firmware.
  - i. The controller allows for a simulator training, both the pilot and spotter are allowed to run through the simulator training

**Appendix B : UAS Information**

**DJI Phantom 2**



**Model:P330Z**  
**Serial: PH64605635**

**Camera: GoPro 4 Black**

***See Appendix C for user manual***

**Appendix C: User Manual**

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# PHANTOM Quick Start Manual v1.7

2013.09.25 Revision

For NAZA-M Firmware V3.12

& Assistant Software V2.12

Thank you for purchasing our product. Please visit the DJI website, PHANTOM section to confirm if the printed manual is the latest one according to the manual version. If not, please download and refer to the latest manual.

Please read the entire manual strictly and follow these steps to use your product. The manual will get you ready to fly by doing simple operations. You can get an advanced manual from DJI website to learn more about PHANTOM, for example, configuring parameters by connecting to assistant software, changing the transmitter to Model, matching frequency between the transmitter and the receiver, etc.

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

Note: The built-in autopilot system is NAZA-M; you can obtain the current NAZA-M Firmware Version according to the Assistant Software. If you ever upgrade your NAZA-M Firmware, please carefully read the corresponding NAZA-M release note and NAZA-M quick start guide.

[www.dji.com](http://www.dji.com)

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## **Disclaimer & Warning**

Please read this disclaimer carefully before using the PHANTOM. By using this product, you hereby agree to this disclaimer and signify that you have read them fully. **THIS PRODUCT IS NOT SUITABLE FOR PEOPLE UNDER THE AGE OF 18.**

PHANTOM is an excellent flight platform offering an excellent flight experience, only if it is powered normally and in a good working condition. Despite the PHANTOM having a built-in autopilot system and our efforts in making the operation of the controller as safe as possible when the main power battery is connected, we strongly recommend users to remove all propellers when calibrating and setting parameters. Make sure all connections are good, and keep children and animals away during firmware upgrade, system calibration and parameter setup. DJI Innovations accepts no liability for damage(s) or injuries incurred directly or indirectly from the use of this product in the following conditions:

1. Damage(s) or injuries incurred when users are drunk, taking drugs, drug anesthesia, dizziness, fatigue, nausea and any other conditions no matter physically or mentally that could impair your ability.
2. Damage(s) or injuries caused by subjective intentional operations.
3. Any mental damage compensation caused by accident.
4. Failure to follow the guidance of the manual to assemble or operate.
5. Malfunctions caused by refit or replacement with non-DJI accessories and parts.
6. Damage(s) or injuries caused by using third party products or fake DJI products.
7. Damage(s) or injuries caused by mis-operation or subjective mis-judgment.
8. Damage(s) or injuries caused by mechanical failures due to erosion, aging.
9. Damage(s) or injuries caused by continued flying after low-voltage protection alert is triggered.
10. Damage(s) or injuries caused by knowingly flying the aircraft in abnormal condition (such as water, oil, soil, sand and other unknown material ingress into the aircraft or the assembly is not completed, the main components have obvious faults, obvious defect or missing accessories).
11. Damage(s) or injuries caused by flying in the following situations such as the aircraft in magnetic interference area, radio interference area, government regulated no-fly zones or the pilot is in backlight, blocked, fuzzy sight, and poor eyesight is not suitable for operating and other conditions not suitable for operating.
12. Damage(s) or injuries caused by using in bad weather, such as a rainy day or windy (more than moderate breeze), snow, hail, lightning, tornadoes, hurricanes etc.
13. Damage(s) or injuries caused when the aircraft is in the following situations: collision, fire, explosion, floods, tsunamis, subsidence, ice trapped, avalanche, debris flow, landslide, earthquake, etc.
14. Damage(s) or injuries caused by infringement such as any data, audio or video material recorded by the use of aircraft.
15. Damage(s) or injuries caused by the misuse of the battery, protection circuit, RC model and battery chargers.
16. Other losses that are not covered by the scope of DJI Innovations liability.

## Cautions for Product Use

**Please check the following steps carefully every time before flight.**

1. Before use of the product, please accept some flight training (Using a simulator to practice flying, getting instruction from a professional person, etc.).
2. Check that all parts of the multi-rotor are in good condition before flight. Do not fly with aging or broken parts.
3. Check that the propellers and the motors are installed correctly and firmly before flight. Make sure the rotation direction of each propeller is correct. Do not get close to or even touch the working motors and propellers to avoid serious injury.
4. Do not over load the multi-rotor (should be less than 1200g).
5. Make sure that the transmitter battery and flight battery are fully charged.
6. Try to avoid interference between the remote control transmitter and other wireless equipment.
7. Make sure to switch on the transmitter first, then power on the multi-rotor before takeoff! Power off the multi-rotor first, then switch off the transmitter after landing!
8. The fast rotating propellers of PHANTOM will cause serious damage and injury. Always fly the multi-rotor 3m or above away from you and unsafe conditions, such as obstacles, crowds, high-voltage lines, etc. **FLY RESPONSIBLY.**
9. All parts must be kept out of the reach of children to avoid CHOKING HAZARD; if a child accidentally swallows any part you should immediately seek medical assistance.
10. Please always keep the compass module away from the magnet. Otherwise it may damage the compass module and lead the aircraft to work abnormally or even be out of control.
11. DO NOT use the PHANTOM transmitter (receiver) with the other third party remote control equipment.
12. Make sure to use the NAZA-M assistant software of 2.0 version (or above 2.0) to carry out firmware upgrade and parameter configuration. DO NOT use the NAZA-M assistant software below 2.0 version.
13. The built-in ESCs of PHANTOM ONLY support 3S (LiPo) power supply.
14. ONLY use the DJI original motor and 8-inch propeller.
15. If you want to put the PHANTOM in a car, please keep it away from the speaker, since the compass module may be magnetized.
16. DO NOT use the magnetic screwdriver. Otherwise, keep the screwdriver at least 10cm away from the compass module, to avoid magnetic interference.
17. If you use your own equipment(for example: GoPro3), please make sure the WiFi function is disabled, to avoid the interference on the transmitter, which may cause the PHANTOM to FailSafe, crack and/or even to fly away.
18. For Mac user, please install Windows Parallel to run assistant software.

If you have any problem you cannot solve during installation, please contact a DJI Authorized Dealer.

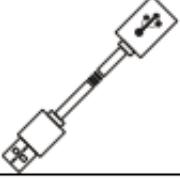
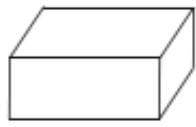
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## Battery Usage & Charging Cautions

1. Do not put the battery into water; store the battery in a cool and dry environment.
2. Only use the correctly specified batteries
3. Batteries must be kept out of the reach of children; if a child accidentally swallows the battery you should immediately seek medical assistance.
4. Do not use or store the battery near fire.
5. Battery should be charged with proper standard charger.
6. Do not connect the battery reversed in positive and negative terminals in the charger or equipment.
7. Do not connect the battery directly to the wall plugs or vehicle-mounted socket.
8. Do not put the battery into a fire or heat the battery.
9. Do not let the battery terminals (+and-) touch together to cause short-circuit.
10. Do not transport or store the battery together with metal objects.
11. Do not hit or throw the battery.
12. Do not weld the battery terminals together.
13. Do not drive a nail in, hit with a hammer, or stomp on the battery.
14. Do not disassemble or alter the battery.
15. Do not use or store the battery in extreme heat environments, such as direct sunlight or in the car in hot weather. Otherwise, the battery will overheat, may cause fire (or self-ignite), this will affect the performance of the battery, shorten the service life of the battery.
16. Do not use the battery in strong electrostatic areas, otherwise the electronic protection may be damaged which may cause a hazard.
17. If you get the battery electrolyte leakage into your eyes, don't rub, first wash your eyes with clean water then seek medical assistance immediately. If not handled in a timely manner, eyes could be damaged.
18. Do not use the battery when it emits an odour, high temperature, deformation, change in colour or other abnormal phenomena; if the battery is in use or charging, you should stop charging or using immediately.
19. If the battery terminal gets dirty, please clean it with a dry cloth before using. Otherwise it will cause a poor contact, thus causing energy loss or inability to charge.
20. Discarded battery could lead to a fire; you should completely discharge the battery and wrap the output terminal with insulating tape before discarding.
21. DO NOT drain the battery of phantom or leave the battery plugged into the PHANTOM when unused. When there is low voltage alert please landing timely to avoid damages to the battery or others.

## In the Box

Aircraft	Transmitter	Landing Gear (with Compass Module)
		
Frame for Camera	Propellers	Assistant Wrench
		
USB Cable	Screw Package (M3x6)	Accessory
		

## Required Items

Phillips Screwdriver	5# AA Batteries
	

## Introduction

The PHANTOM is an all-in-one small Quad Copter designed for multi-rotor enthusiasts. Before shipping from the factory, it has been configured and fully tested, which means you have no configuration to do.

### ● Built-in

- ✓ NAZA-M Autopilot System

(Refer to NAZA-M manual for details)

- ✓ GPS & Compass Module

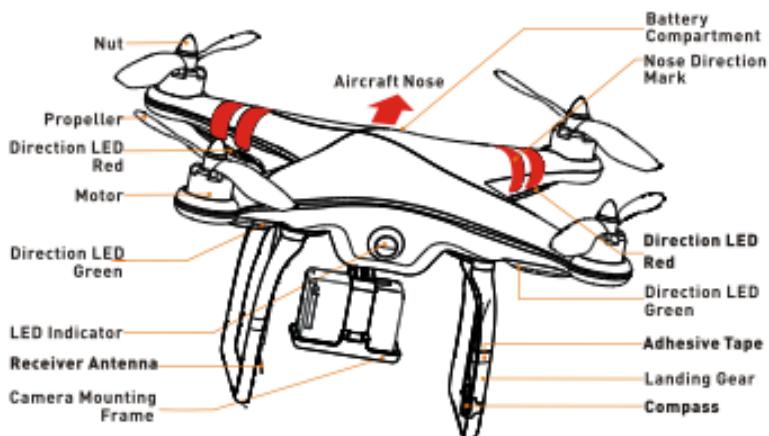
- ✓ R/C Receiver

- ✓ Power System for Flight

- ✓ LED Indicator

- ✓ USB Interface

(in the Battery Compartment)



### ● Function

- ✓ ATTI./GPS ATTI. Mode

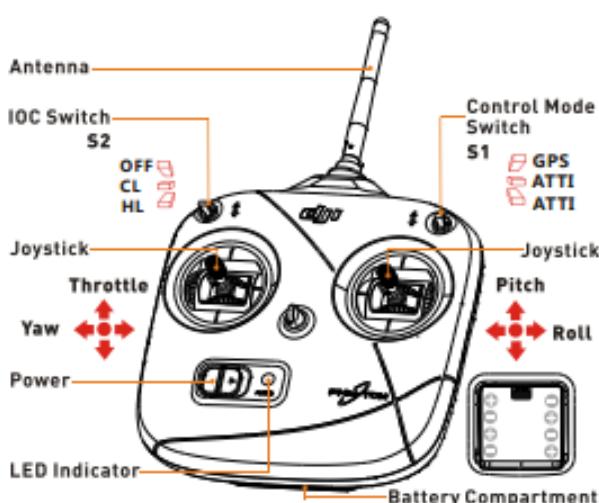
- ✓ Intelligent Orientation Control

- ✓ Enhanced Fail-Safe

- ✓ Low-Voltage Alert

### ● Camera Frame (For GoPro)

### ● Takeoff Weight:<1200g



- ✓ Working Frequency: 2.4GHz ISM
- ✓ Control Channel Numbers of Transmitter: 7
- ✓ Communication Distance: 1000m
- ✓ Receiver Sensitivity(1%PER): > -100dBm
- ✓ Power Consumption of Transmitter: < 20dBm
- ✓ Working Current/Voltage: 52 mA@6V
- ✓ AA Battery (5#): 4 Required



## Aircraft & Transmitter Basic Operation

### Definitions

- **Stick neutral position and stick released** means the stick of Transmitter is pushed to the central position.
- **Command Stick** means the stick of Transmitter is pushed away from the central position.

Transmitter	Aircraft (← is the nose direction )	GPS ATTI. Mode/ATTI. Mode
		Throttle stick is for aircraft up& down control. The aircraft will hold the height automatically if the stick is centered. You should Push the throttle stick to the neutral position to take-off the multi-rotor. Note that the stick returns to the central position when released for the transmitter V3.5. For the version below 3.5, the stick cannot hold the central position when released.
		Yaw stick is for aircraft rudder control. Command stick controls the angular velocity of the aircraft, with the maximum rudder angular velocity of 200°/s. Left stick command gives counter clock-wise rotation of the aircraft, & vice versa.
		Roll stick is for aircraft left/right control and Pitch stick is for front/back control. Command stick controls the angle of the aircraft. Stick neutral position is for 0°, its endpoint is 35°. The roll and pitch sticks return to the central position when released. <ul style="list-style-type: none"> <li>• In GPS Mode, the aircraft will hover (hold horizontal position) when sticks released.</li> <li>• In ATTI. Mode, the aircraft will keep attitude stabilizing without horizontal position (different from hover in GPS Mode).</li> </ul>
	GPS ATTI.    ATTl.    ATTl.  (Manual or Failsafe is selectable in software.)	3-position switch (S1) on the Transmitter for mode control. Only after Compass Module connection and Compass calibration, GPS ATTI. Mode is available. Otherwise, all switch positions are for ATTl. Mode. Pay attention because the GPS ATTI Mode is dependent on the number of GPS satellites acquired by the main controller. Refer to the LED Indicator. When GPS signal has been lost for 3s, system enters ATTl Mode automatically. You can enable the Manual Mode or FailSafe (also known as One-key Go-home) in the assistant software->Basic->R/C->Control Mode.
	OFF    Course Lock    Home Lock	3-position switch (S2) on the Transmitter for Intelligent Orientation Control (IOC). Set the switch to OFF in basic flight.  <b>This function is defaulted to off.</b> If you want to use this function refer to the advanced manual, and enable it in the assistant software. Use IOC when you are familiar with basic flight.

You can change the operation mode of the Transmitter according to the advanced manual if necessary.

## Before Flying

### 1. Installing the Transmitter Batteries

1. Open the battery compartment cover of the Transmitter.
2. Install 4x AA battery (5#) in accordance with the + / - pole.
3. Close the battery compartment cover of the Transmitter.

- DO NOT use the PHANTOM transmitter (receiver) with the other third party remote control equipment.
- Risk of explosion if replaced by an incorrect type.
- Dispose of used batteries according to the instructions.
- Remove the batteries after use.
- When the voltage is lower than 4V, the transmitter will alarm with sound of "BB.....", please change the batteries.

### 2. Battery Charging - LiPo Battery

Please use the full charged battery of 3S LiPo.

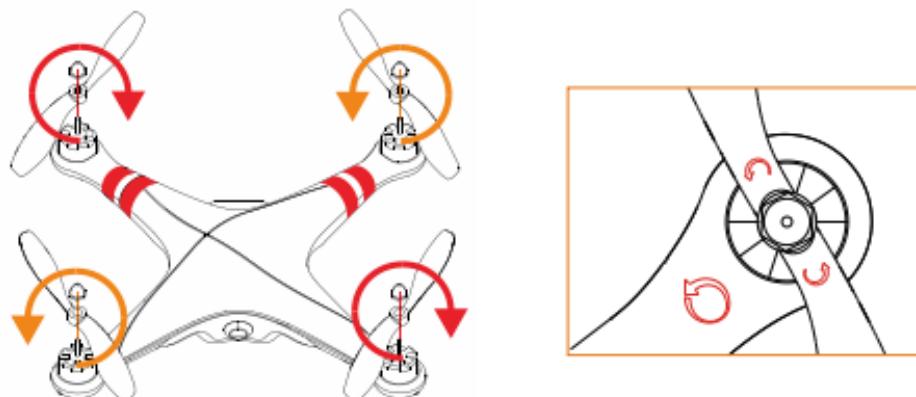
(Recommended parameters: 733496 - 2200MAH-20C - 11.1V.)

The built-in ESCs of PHANTOM ONLY support 3S (11.1V) power supply. DO NOT use the battery of higher voltage.

### 3. Fitting the Propeller

1. First prepare the aircraft and the propellers (original 8-inch).
2. Assemble the propellers (the side with rotary mark facing up) to the aircraft. Make sure the rotary mark on the propeller is the same as the mark on the frame arm. The arrow's direction stands for the rotating direction of the motors.
3. Finally fit the propeller nuts.

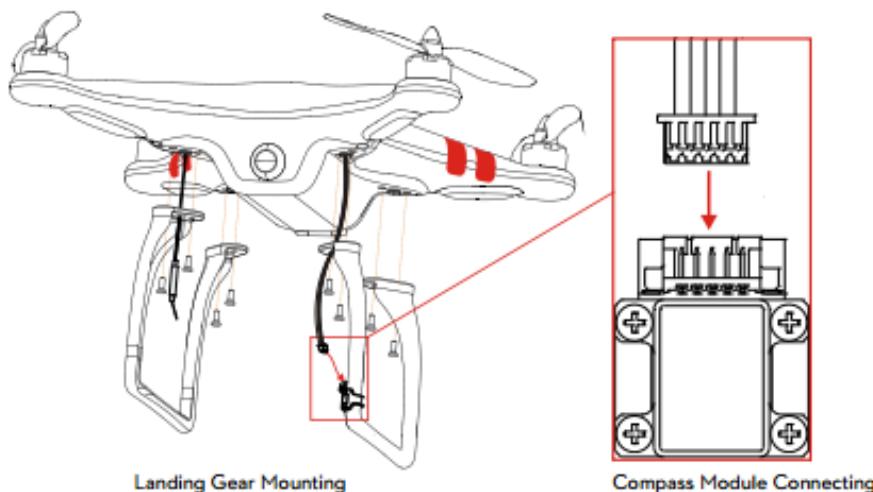
DO NOT use thread locker when mounting the propellers, just tighten the screws is enough.



#### **4. Mount the Landing Gear with the Compass Module if Required**

If the GPS ATTI. Mode is desired, you must first mount the landing gear which contains the Compass Module.

1. Prepare the aircraft and the landing gear.
2. Mount the landing gear with the Compass Module to the right part (shown as the following chart); make sure the 5-pin cable is through the hole of the landing gear. Fix the landing gear with screws (M3x6), and then connect the 5-pin cable to the Compass Module.
3. Mount the other landing gear to the left part.
4. Fix the antenna and the 5-pin cable on both landing gear by using the white adhesive tape.



- When flying, please make sure the compass module is stationary and firm.
- If the Landing Gear with the compass module mount on has been deformed, please replace it with a new one and mount it as the procedures above.
- The compass module is not waterproof, and not anti-oil.
- **DO NOT** use the magnetic screwdriver. Otherwise, keep the screwdriver at least 10cm away from the compass module, to avoid magnetic interference.

#### **5. Turn on the Transmitter**

1. Set the IOC and Control Mode switch to the top position.
2. Turn on the power switch of the Transmitter

## 7. GPS & Compass Calibration

If the Compass Module is not used, you can skip this step.

The GPS module has a built-in magnetic field sensor for measuring the geomagnetic field, which is not the same in different areas. The GPS module will not work unless the Compass Module has been connected. Make sure the Compass Module connections are correct.

Please always keep the compass module away from the magnet. If this situation occurs please change the compass module before flying. Otherwise it may damage the compass module and lead the aircraft to work abnormally or even be out of control.

Calibrate the compass before the first flight or when flying in a different area. Make sure to keep away from ferromagnetic substance and other electronic equipment when calibrating or flying. If you keep having calibration failure, it might suggest that there is magnetic interference or other ferromagnetic substance, please avoid flying in this area.

If you have calibration failure or the LED blinks red and yellow alternately (  ), please connect to the Assistant Software, select the "Tools" tab and follow the tips of the "IMU Calibration" to do operation.

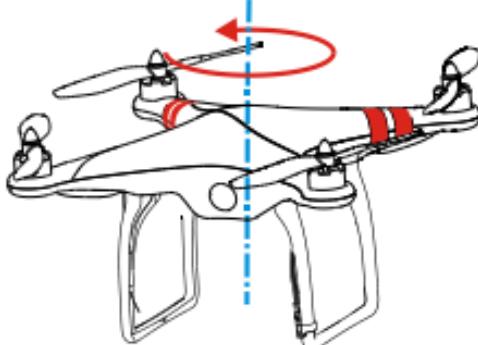
1. Quickly switch the control mode switch from **ATTI Mode** to **GPS ATTI Mode** and back to **ATTI Mode** for 6 to 10 times. The LED indicator will turn to constantly yellow.
2. Rotate your aircraft around the horizontal axis (about 360°) until the LED changes to constant green, and then go to the next step.
3. Hold your aircraft vertically and rotate it (its nose is downward) around the vertical axis (about 360°) until the LED turns off, meaning the calibration is finished.
4. If the calibration was successful, calibration mode will exit automatically. If the calibration has failed, the LED keeps flashing quickly Red. Switch the control mode switch one time to cancel the calibration, and then re-start from step 1.

GPS ATTI. Mode

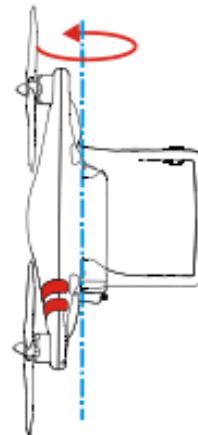


ATTI. Mode

ATTI. Mode->GPS ATTI. Mode ->  
ATTI. Mode is one time , quickly  
switch 6 to 10 times



Horizontal Rotation



Vertical Rotation

## Flight Test

1. If in GPS ATTI. Mode, place the aircraft in an open space without buildings or trees. Take off the aircraft after 6 or more GPS satellites are found (Red LED blinks once or no blinking). If in ATTI. Mode, you can skip this step.
2. Place the aircraft 3 meters away from you and others, to avoid accidental injury.
3. Start-up
  - ✓ Switch on the transmitter first, then power on multi-rotor! Keep the aircraft stationary until the system start and self-check has finished.
  - ✓ Please wait for the system to warm up gradually with the LED blinks Yellow 4 times quickly (●●●●). You should not start the motors until the blinking disappears.
  - ✓ Keep the aircraft stationary, and execute the CSC to start the motors.
  - ✓ Release the yaw, roll and pitch sticks and keep them at the neutral position, at the same time raise the throttle stick from the bottom. The motors will stop if you do not push the throttle stick from the bottom within 3 sec and you will need to re-start the motors.
  - ✓ Keep raising the throttle stick until all the rotors are working, push the throttle stick to the mid position and then take-off your multi-rotor gently, pay attention not to push the stick excessively.
  - ✓ Pay attention to the aircraft movement at any time, and use the sticks to adjust the aircraft's position. Keep the yaw, roll, pitch and throttle sticks at the mid position to hover the aircraft at desired height.
4. Lower the aircraft slowly until touch down is achieved. The motors will stop automatically after 3 seconds, or you can repeat the start-up stick command to stop the motors sooner.
5. Please always power off the aircraft first, and then switch off the transmitter after landing.

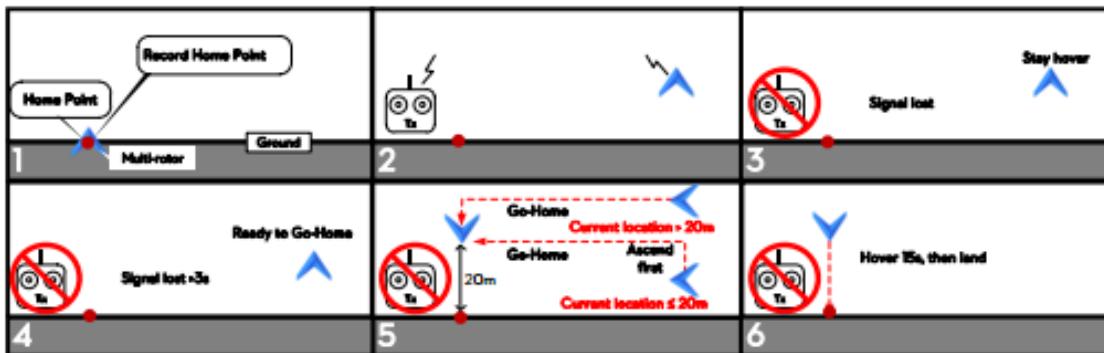
## FLYING NOTES !!!

- ✓ At the first motors start, the system will check the sensors Bias and you are asked to keep the aircraft stationary (no need of horizontal level). If you cannot start the motors and the LED blinks Green 6 times quickly (●●●●●●), it means that the sensor error is too big. Please connect the assistant software, enter the "Tools" -> IMU calibration, carry out basic calibration.  
Note: after the first successful motors start, this checking will be disabled and it is no need any more to keep the aircraft stationary during starting motors.
- ✓ If in GPS ATTI. Mode, keep the aircraft flying in the open space without obstruction. Pay attention to the GPS satellite status indicator LED. When GPS signal has been lost for 3s (red LED blink twice or three times), system enters ATTI. Mode automatically.
- ✓ If the battery voltage is too low for flying, the aircraft enters the first level protection with LED flashing quickly Red, please land ASAP. Once the aircraft enters the second level protection, the aircraft will drop height automatically.
- ✓ If you want to put the PHANTOM in a car, please keep it away from the speaker, since the compass module may be magnetized.
- ✓ DO NOT fly near to ferromagnetic substances, to avoid strong magnetic interference with the GPS.
- ✓ It is recommended to land the aircraft slowly, to prevent the aircraft from damage when landing.
- ✓ If the Transmitter indicates low-battery alert, please land ASAP. In this condition the Transmitter may cause the aircraft to go out of control or even crash.



## The flowchart of failsafe and how to regain control

### An introduction of Go-Home and Landing.



**Home-point:** Every time you power on, after first motors start, and if 6 or more GPS satellites are found (Red light blinks once or no blinking) for 10 seconds, the current position of multi-rotor will be saved as home-point by MC automatically.



1. Please make sure to record the home-point during flight, and clearly know where it is.

Note

2. During go-home the nose direction of the aircraft is facing toward the home-point, and the aircraft is flying directly from the current position to the home-point.

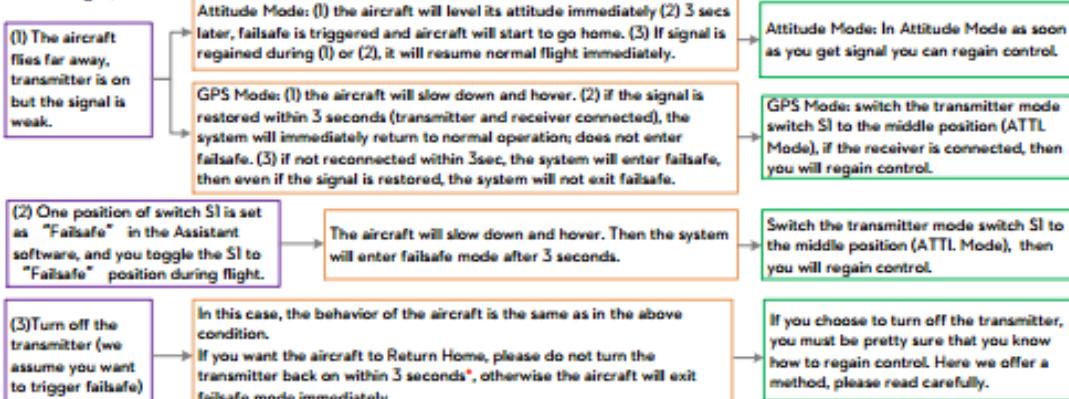
The flowchart of failsafe and how to regain control(the following content is for the firmware v3.12)

This section will demonstrate the working logic of failsafe and how to regain control.

The following description is effective only when:

1. The aircraft is in flight.
2. The GPS works normally and **signal is GOOD** ( $\geq 6$  satellite, the LED blinks a single red light or no red light).

— What triggered failsafe  
— The aircraft behavior after failsafe  
— How to regain control  
— Precautions



We strongly recommend you DO NOT try "Turn off the transmitter", because there are three types of risk:

- (1) You must be pretty clear whether the Home-point is OK for landing or not. (You have to understand the definition of Home point well and the working process of failsafe)
- (2) If there are tall buildings around, the aircraft may be obstructed on the way.
- (3) When GPS signal is bad or GPS is not working, failsafe will not work.

Note: If you start the motors, but do not push the throttle to take-off the aircraft, in this case it is very dangerous to turn off the transmitter, because the aircraft will take off automatically, so do not try this.

\* If signal lost for more than 3 seconds failsafe will be triggered, if signal regained within 3 seconds it will exit failsafe immediately.

When you turn off the transmitter, use the following method to regain control:

- (1) Switch the transmitter S1 switch to GPS, position.
- (2) and then put the throttle stick to lowest position, you can now turn the transmitter back on (greater than 5secs after switching off, important), then put throttle stick to the center position immediately. If you hear the transmitter alarm, make sure the throttle stick is at the bottom position before moving to the center position.
- (3) then you can switch the transmitter S1 switch to the middle position (ATTL Mode) to regain control.

#### **Low-Voltage Alert**

Low-Voltage Alert is to indicate that the battery cannot provide enough power for the aircraft, in order to warn you to land the aircraft ASAP. There are both first level and second level protections. It is not for fun, you should land your aircraft ASAP to prevent your aircraft from crashing or other harmful consequences!!!

In ATT. Mode & GPS ATT. Mode.

- ✓ The first level protection has LED warning.
  - ✓ During second level protection the aircraft will land automatically with LED warning. Meanwhile the center point of throttle stick will move up slowly to 90% of endpoint, you should land ASAP to prevent your aircraft from crashing! When the center point is at 90% of endpoint, aircraft will still ascend slowly if you continue to pull the throttle stick, and the control of Pitch, Roll and Yaw are the same as before.

- (1) Configure the FailSafe function in the **assistant software** → "Advanced" → "F/S" and read the instruction thoroughly and carefully.
  - (2) Configure the Low-Voltage Alert function in the **assistant software** → "Advanced" → "Voltage" and read the instruction thoroughly and carefully.

## LED Description

System Status	LED Flashing
System start and self-check	
IMU abnormal data	
Warm up after power on	
Bias of Sensors too Big	
Compass Error too Big	
Tx signal lost	
Low Voltage Alert	
Record forward direction or home point	
Control Mode Indictor	Manual Mode: None
	ATTI. Mode:
	GPS Mode:
	IOC Mode:
GPS Signal State Indicator ( GPS/Compass Module is necessary )	GPS Signal is Best(GPS Satellite number > 6):
	GPS Signal is Well(GPS Satellite number = 6):
	GPS Signal is Bad (GPS Satellite number = 5) :
	GPS Signal is Worst (GPS Satellite number < 5):

Compass Calibration	LED Flashing
Begin horizontal calibration	
Begin vertical calibration	
Calibration or others error	

### ESC Sound Introduction

ESC State	Sound
Ready	J1234567
Throttle stick is not at bottom	BBBBBBB...
Input signal abnormal	B-----B-----B...
Input voltage abnormal	BB---BB---BB---BB...

### Transmitter State Introduction

Transmitter State	Introduction
The throttle stick isn't at the lowest position after turning on may alarm.	B—BB
Linking between the Transmitter and the Receiver	●●●●●
Normal Operation	■■■■■
Low-battery Alert (Need to change the battery)	BB.....

### Specifications of the Aircraft

Parameters	Range
Operating Temperature	-10°C - 50°C
Power Consumption	3.12W
Supported Battery	ONLY 3S LiPo
Take-off Weight	<1200g
Hovering Accuracy (GPS Mode)	Vertical: 0.8m. Horizontal: 2.5m
Max Yaw Angular Velocity	200°/s
Max Tilt Angle	35°
Max Ascent / Descent Speed	6m/s
Max Flight Velocity	10m/s
Diagonal distance (motor center to motor center)	350mm
Weight	670g
Weight(with Battery)	800g

## **CE Statement**

Due to the used enclosure material, the device shall only be connected to a USB Interface of version 2.0 or higher. The connection to so called power USB is prohibited.

**CAUTION RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.**

Hereby, DJI Innovations Corporation declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

**CE 0700**

## **FCC Statement**

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.

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.

**NOTE:** The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes could void the user's authority to operate the equipment.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
**CERTIFICATE OF WAIVER OR AUTHORIZATION**

**ISSUED TO**

Waking Sky LLC

16844 68th Street North  
Loxahatchee, FL 33470

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

**OPERATIONS AUTHORIZED**

Operation of DJI Phantom 2 Unmanned Aircraft Systems at or below 200 feet Above Ground Level (AGL) for the purpose of aerial data collection.

**LIST OF WAIVED REGULATIONS BY SECTION AND TITLE**

N/A

**STANDARD PROVISIONS**

1. A copy of the application made for this certificate shall be attached and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

**SPECIAL PROVISIONS**

Special Provisions are set forth and attached.

This certificate FAA-2015-1095-333E is effective from June 23, 2015 to June 30, 2017 and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.

**BY DIRECTION OF THE ADMINISTRATOR**

/S/

FAA Headquarters, AJV-115  
(Region)

Jacqueline R. Jackson  
(Signature)

June 15, 2015  
(Date)

Manager, UAS Tactical Operations Section  
(Title)

**FAA Form 7711-1 (7-74)**

## STANDARD PROVISIONS

### A. General.

1. The approval of this COA is effective only with an approved FAA Grant of Exemption.
2. A copy of the COA including the special limitations must be immediately available to all operational personnel at each operating location whenever UAS operations are being conducted.
3. This authorization may be canceled at any time by the Administrator, the person authorized to grant the authorization, or the representative designated to monitor a specific operation. As a general rule, this authorization may be canceled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with the authorization is cause for cancellation. The operator will receive written notice of cancellation.

### B. Safety of Flight.

1. The operator or pilot in command (PIC) is responsible for halting or canceling activity in the COA area if, at any time, the safety of persons or property on the ground or in the air is in jeopardy, or if there is a failure to comply with the terms or conditions of this authorization.

#### See-and-Avoid

Unmanned aircraft have no on-board pilot to perform see-and-avoid responsibilities; therefore, when operating outside of active restricted and warning areas approved for aviation activities, provisions must be made to ensure an equivalent level of safety exists for unmanned operations consistent with 14 CFR Part 91 §91.111, §91.113 and §91.115.

- a. The pilot in command (PIC) is responsible:

- To remain clear and give way to all manned aviation operations and activities at all times,
- For the safety of persons or property on the surface with respect to the UAS, and
- For compliance with CFR Parts 91.111, 91.113 and 91.115

- b. UAS pilots will ensure there is a safe operating distance between aviation activities and unmanned aircraft (UA) at all times.

- c. Visual observers must be used at all times and maintain instantaneous communication with the PIC.

- d. The PIC is responsible to ensure visual observer(s) are:

- Able to see the UA and the surrounding airspace throughout the entire flight, and
  - Able to provide the PIC with the UA's flight path, and proximity to all aviation activities and other hazards (e.g., terrain, weather, structures) sufficiently for the PIC to exercise effective control of the UA to prevent the UA from creating a collision hazard.
- e. Visual observer(s) must be able to communicate clearly to the pilot any instructions required to remain clear of conflicting traffic.
2. Pilots are reminded to follow all federal regulations e.g. remain clear of all Temporary Flight Restrictions, as well as following the exemption granted for their operation.
  3. The operator or delegated representative must not operate in Prohibited Areas, Special Flight Rule Areas or, the Washington National Capital Region Flight Restricted Zone. Such areas are depicted on charts available at [http://www.faa.gov/air\\_traffic/flight\\_info/aeronav/](http://www.faa.gov/air_traffic/flight_info/aeronav/). Additionally, aircraft operators should beware of and avoid other areas identified in Notices to Airmen (NOTAMS) which restricts operations in proximity to Power Plants, Electric Substations, Dams, Wind Farms, Oil Refineries, Industrial Complexes, National Parks, The Disney Resorts, Stadiums, Emergency Services, the Washington DC Metro Flight Restricted Zone, Military or other Federal Facilities.
  4. All aircraft operated in accordance with this Certificate of Waiver/Authorization 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.

### C. Reporting Requirements

1. Documentation of all operations associated with UAS activities is required regardless of the airspace in which the UAS operates. NOTE: Negative (zero flights) reports are required.
2. The operator must submit the following information through <mailto:9-AJV-115-UASOrganization@faa.gov> on a monthly basis:
  - a. Name of Operator, Exemption number and Aircraft registration number
  - b. UAS type and model
  - c. All operating locations, to include location city/name and latitude/longitude
  - d. Number of flights (per location, per aircraft)
  - e. Total aircraft operational hours
  - f. Takeoff or Landing damage

- g. Equipment malfunctions. Reportable malfunctions include, but are not limited to the following:
  - (1) On-board flight control system
  - (2) Navigation system
  - (3) Powerplant failure in flight
  - (4) Fuel system failure
  - (5) Electrical system failure
  - (6) Control station failure
- 3. The number and duration of lost link events (control, performance and health monitoring, or communications) per UA per flight.

**D. Notice to Airmen (NOTAM).**

A distant (D) NOTAM must be issued when unmanned aircraft operations are being conducted. This requirement may be accomplished:

- a. Through the operator's local base operations or NOTAM issuing authority, or
- b. By contacting the NOTAM Flight Service Station at 1-877-4-US-NTMS (1-877-487-6867) not more than 72 hours in advance, but not less than 24 hours prior to the operation, unless otherwise authorized as a special provision. The issuing agency will require the:
  - (1) Name and address of the pilot filing the NOTAM request
  - (2) Location, altitude, or operating area
  - (3) Time and nature of the activity.
  - (4) Number of UAS flying in the operating area.

**AIR TRAFFIC CONTROL SPECIAL PROVISIONS**

**A. Coordination Requirements.**

- 1. Operators and UAS equipment must meet the requirements (communication, equipment and clearance) of the class of airspace they will operate in.
- 2. Operator filing and the issuance of required distance (D) NOTAM, will serve as advance ATC facility notification of UAS operations in an area.
- 3. Operator must cancel NOTAMs when UAS operations are completed or will not be conducted.
- 4. Coordination and deconfliction between Military Training Routes (MTRs) is the operator's responsibility. When identifying an operational area the operator must

evaluate whether an MTR will be affected. In the event the UAS operational area overlaps (5 miles either side of centerline) an MTR, the operator will contact the scheduling agency 24 hours in advance to coordinate and deconflict. Approval from the scheduling agency is not required. Scheduling agencies are listed in the Area Planning AP/1B Military Planning Routes North and South America, if unable to gain access to AP/1B contact the FAA at email address <mailto:9-AJV-115-UASOrganization@faa.gov> with the IR/VR routes affected and the FAA will provide the scheduling agency information. If prior coordination and deconfliction does not take place 24 hours in advance, the operator must remain clear of all MTRs.

**B. Communication Requirements.**

1. When operating in the vicinity of an airport without an operating control tower, announce your operations in accordance with the FAA Aeronautical Information Manual (AIM) 4-1-9 Traffic Advisory Practices at Airports without Operating Control Towers.

**C. Flight Planning Requirements.**

Note: For all UAS requests not covered by the conditions listed below, the exemption holder may apply for a new Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA) at <https://oeaaa.faa.gov/oeaaa/external/uas/portal.jsp>

This COA will allow small UAS (55 pounds or less) operations during daytime VFR conditions under the following conditions and limitations:

- (1) At or below 200 feet AGL; and
- (2) Beyond the following distances from the airport reference point (ARP) of a public use airport, heliport, gliderport, seaplane base and military airports listed in the Airport/Facility Directory, Alaska Supplement, or Pacific Chart Supplement of the U.S. Government Flight Information Publications.
  - a) 5 nautical miles (NM) from an airport having an operational control tower; or
  - b) 3 NM from an airport having a published instrument flight procedure, but not having an operational control tower; or
  - c) 2 NM from an airport not having a published instrument flight procedure or an operational control tower; or
  - d) 2 NM from a heliport, gliderport or seaplane base

**D. Emergency/Contingency Procedures.**

1. Lost Link/Lost Communications Procedures:

- 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 and land.
  - The PIC must abort the flight in the event of unpredicted obstacles or emergencies.
2. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries defined in this COA must be reported to the FAA via email at <mailto:9-AJV-115-UASOrganization@faa.gov> 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](http://www.ntsb.gov)

## AUTHORIZATION

This Certificate of Waiver or Authorization does not, in itself, waive any Title 14 Code of Federal Regulations, nor any state law or local ordinance. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the responsibility of the operator to resolve the matter. This COA does not authorize flight within Special Use airspace without approval from the scheduling agency. The operator is hereby authorized to operate the small Unmanned Aircraft System in the National Airspace System.