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

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

July 31, 2015

Exemption No. 12249
Regulatory Docket No. FAA–2015–2028

Mr. Jordan Keeney
Consulting Services Incorporated LLC
858 Contract Street
Lexington, KY 40505

Dear Mr. Keeney:

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 May 15, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Consulting Services Inc. LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial imaging and videography.

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

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

Airworthiness Certification

The UAS proposed by the petitioner are the DJI Phantom 2 Vision+, DJI Phantom 3 Vision, and DJI Inspire 1.

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

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

The Basis for Our Decision

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

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

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

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, Consulting Services Inc. 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.

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

Conditions and Limitations

In this grant of exemption, Consulting Services Inc. 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 Vision+, DJI Phantom 3 Vision, and DJI Inspire 1when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

This exemption terminates on July 31, 2017, unless sooner superseded or rescinded.

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

Enclosures

Consulting Services Incorporated
Lexington 859.309.6021 | Cincinnati 513.252.2059 | Louisville 502.532.8269
Geotechnical & Materials Engineering | IBC Special Inspection | Material Testing

May 15, 2015

U.S. Department of Transportation
Docket Operations, M-30
1200 New Jersey Avenue, SE
Room W12-140, West Building Ground Floor
Washington, DC 20590-0001

Re: Petition of **Consulting Services Incorporated of Kentucky (CSI)** for an Exemption Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 to Operate an Unmanned Aircraft System

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 and 14 C.F.R. Part 11, Consulting Services Inc. LLC, hereafter referred to as "CSI", would like to apply for an exemption from the following Code of Federal Regulations (C.F.R) to be allowed commercial operation of lightweight Unmanned Aircraft Systems (UAS) for aerial imaging and video in the immediate and surrounding areas of Lexington, Kentucky.

DJI Phantom 3 Vision Professional ("Vision") and DJI Inspire 1, seeks an exemption from the Federal Aviation Regulations ("FARs") listed below:

14 CFR 21; 14 CFR 45.23 (b); 14 CFR 61.113 (a) & (b); 14 CFR 407 (a)(1); 14 CFR 409 (a)(2); 14 CFR 417 (a) & (b).; 14 CFR 45.23(b); 14 CFR Part 21; 14 CFR 61.113(a)&(b); 14 CFR 91, 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).

CSI is consulting engineering firm comprised of professional engineers and staff professionals that specialize in geotechnical exploration and geotechnical engineering. Our staff professionals have had experience with flying the DJI Phantom and the DJI Inspire 1 for recreational and research purposes as well as the use of DJI's Pilot software without incident.

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DJI Flight Limits and Restricted Areas
DJI Pilot App and Pix4D Flight Path Examples

The UAS: DJI Phantom and DJI Inspire 1

The requested exemption will permit the operation of small, unmanned multirotor aircraft, namely the DJI Phantom 2 Vision+, DJI Phantom 3 Professional/Advanced, and the DJI Inspire 1. Users all over the world have proven these UAS's effective and safe and DJI also continues to develop software and hardware to increase the safety of flying UAS's.

These systems are produced completely assembled and ready to fly straight from DJI. CSI plans to not make any modifications to the UAS except for the addition of OEM propeller guards for enhanced safety purposes.

The four main characteristics of the Vision series UASs by DJI are:

1. Very Light Weight

The Vision series by DJI are light enough so that the operator can launch them by hand and land them on most surfaces without requiring a parachute or landing net. The low potential energy of the UAS also reduces the risk of hazardous situations in case that a emergency landing is necessary. The rotor arms of the Vision series UAS are rounded with no sharp edges and we will also be utilizing DJI's recommended propeller guard system to increase the safety of our personnel when launching and landing the UAS.

2. Electric Powered

The Vision series UAS by DJI are electric powered and employ removable smart batteries. The "Intelligent Flight Battery" developed by DJI is a LiPo 4S battery that is capable of producing a flight time of up to 23 minutes. This flight time would allow us to complete our flight plans with ease and without the worry of our batteries running out of charge.

If our batteries do get low during a flight, the intelligent flight battery will warn us by a series of beeps and on screen notifications so that we will have ample time to find a safe area to land the UAS.

3. Semi-Automatic Flight

The artificial intelligence incorporated within the Vision series UASs continuously analyzes data from the Initial Measurement Unit, the onboard GPS, and the newly available (Phantom 3 Vision models only) visioning positioning system. These systems allow for the user to focus more on the data that they are trying to capture and less on the actual flying of the drone.

The new visioning positioning system uses visual and ultrasonic sensors to scan the ground beneath the Phantom 3 for patterns, enabling it to identify it's position and move accurately while avoiding obstacles automatically.

4. Enhanced Autopilot Functionality

a. Auto-Takeoff

With one tap within the DJI Pilot application, the Phantom 3 will turn on its motors and rise to a pre-set height. It will then hover perfectly in place until our personnel directs it where to go.

b. Auto-Return Home

When GPS is available, the Phantom 3 remembers the exact spot that it took off from. Whenever the aircraft is flying, our personnel can tap a button within the DJI Pilot application to have it return to the place that it took off from.

c. Failsafe

If the Intelligent Flight Battery is running low, or if the Phantom 3 loses the connection with the remote controller for any reason, the aircraft will automatically return to the takeoff point and land safely.

Flight Applications

The UAS will be flown in airspace under 400ft above ground level. CSI will only fly the UAS under controlled conditions on restricted, rural, or private property. The UAS will be used to monitor geotechnical situations like active landslides, waste landfills, coal ash landfills, construction-related studies, and karst topography.

1. Landslides

CSI proposes exemption under Section 333 to operate commercially in public and private secured-entry landslide investigation sites. These landslides can be either currently active or have already failed. In either case, traversing the terrain physically can be dangerous to our staff and engineering personnel. By utilizing the high definition camera on the DJI Vision UASs the staff at CSI engineering can gain new perspectives of landslides from safe areas, while still in the line of site of the UAS.

The benefit of not putting our personnel on the failure surface can greatly enhance our ability to analyze landslides while at the same time increase the safety of our employees.

2. Karst Topography

CSI proposes to use UAS's to capture digital images of karst areas. From these images CSI will be able to better locate areas that could potentially be sink holes quickly and safely.

Regulations for which Exemption is Requested

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 UAS's, an exemption from Part 21 Subpart H meets the requirements of an equivalent level of safety under Part 11 and §333 of the Reform Act. The Federal Aviation Act (49 U.S.C.§44701 (f)) and §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 and without the restrictions and conditions proposed.

The UAS's to be operated by CSI are less than 5lbs. at maximal payload capacity that consists of remote sensing instrumentation. The UAS will not carry any persons, explosives or flammable materials including combustible fuels, and the UAS will operate exclusively within a secured area. Unlike other civil aircraft, operations under this exemption will be tightly controlled and monitored by both the pilot (PIC) and the Spotter. These enhancements to current safety practices and regulations, which already apply to civil aircraft, provide a greater degree of safety to the public and property owners than conventional aircraft operations conducted with airworthiness certificates issued under 14 C.P.R. Part 21, Subpart H. Lastly, application of these same criteria demonstrates that there is no intrinsic 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.P.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 UAS, two- inch lettering will be impossible. CSI understands the need for markings and will mark our UAS in the largest possible lettering by placing the word “Experimental” or assigned number or name (based on a request or ruling by the FAA) on its fuselage as required by §45.29(f) so that anyone assisting the spotter will see the markings. Further markings include the use of flashing green & red LED illumination on the underside of the UAS frame, which adds contrast against a blue or white sky.

14 C.P.R. §61.113 (a) & (b): Private Pilot Privileges and Limitations: Pilot in Command (PIC)

§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 a ground crew member to have a private pilot's license rather than a commercial pilot's license to operate this UAS. Unlike a conventional aircraft that carries the pilot and passengers, the UAS is remotely controlled with no persons on board. The area of operation is controlled and restricted, and all flights are planned and coordinated in advance. The risks associated with the operation of the UAS are so diminished from the level of risk associated with commercial operations contemplated by Part 61 when drafted, that allowing operations as requested with a private pilot in the ground crew exceeds the present level of safety achieved by 14 C.P.R. §61.113 (a) & (b). CSI’s staff professionals have experience flying numerous practice flights in remote areas as a hobbyist simulating flights to increase the experience and skills needed for flying a UAS. CSI also owns and practice on a computerized simulated flight software to increase skill levels and gain knowledge of how to maneuver the UAS safely at all times.

14 C.P.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 checklists prior to each flight, which are provided in the appendix, an equivalent level of safety will be provided.

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

§91.9 (b) (2) provides: No person may operate a U.S. -registered civil aircraft ... (2) For which an Airplane or Rotorcraft Flight Manual is not required by §21.5 of this chapter, unless there is available in the aircraft a current approved airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof. The UAS, given its size and configuration has no ability to carry a physical flight manual 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 UAS 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.P.R. §91.1 03: Preflight Action

This regulation requires each Pilot in Command (PIC) 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. The PIC will take all actions including reviewing weather, flight battery requirements, landing and takeoff distances and aircraft performance data before initiation of flight. Further, CSI will employ manufacturer (DJI) preflight recommendations to guarantee that best practices are implemented.

Phantom 3 Professional- Preflight Checklist

Preflight Checklist

1. Remote controller, Intelligent Flight Battery, and mobile device are fully charged.
2. Propellers are mounted correctly and firmly.
3. Micro-SD card has been inserted, if necessary.
4. Gimbal is functioning normally.
5. Motors can start and are functioning normally.
6. The DJI Pilot app is successfully connected to the aircraft.

DJI has implemented Firmware updates that limit flight around airports, along with distance and elevation limits

14 C.P.R. §91.109: Flight Instruction

§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. UAS's 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. Enhancing this safety is the technology inherent in the remote controls utilizing digital communications, which is paired to the UAS making it nearly impossible to unintentionally or intentionally have the control communications interrupted.

14 C.P.R. §91.119: Minimum Safe Altitudes

§91.119 establishes safe altitudes for operation of civil aircraft. §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 UAS that closely mimics the behavior of a helicopter, and the exemption requests authority to operate at altitudes up to 400 feet AGL, an exemption may be needed to allow such operations. As set forth herein, the UAS will never operate at higher than 400 feet AGL or beyond unaided visual line of sight, whichever is closer. It will however be operated in a restricted area with individuals tasked with ensuring public safety, and where buildings and people will not be exposed to operations without their pre-obtained consent and training. 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 operation will be taken without the permission of the property owner. Because of the advance notice to the property owner and participants in the remote sensing activity, all affected individuals will be aware of the planned flight operations. Compared to flight operations with aircraft or rotor craft weighting far more than the maximum 5 lbs. of CSI's UAS's 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 addition, the low-altitude operations of the UAS will ensure separation between these small- UAS operations and the operations of conventional aircraft that must comply with §91.119.

14 C.P.R. §91.121 Altimeter Settings

§91.121 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 UAS may not have a barometric altimeter, but instead a GPS altitude read out, an exemption may be needed. An equivalent level of safety will be achieved by the operator, confirming the altitude of the launch site shown on the GPS altitude indicator before flight. The operator (PIC) will also ensure effective pairing with multiple GPS sources to guarantee accurate detection of height.

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

§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 batteries powering the UAS's provide approximately 23 minutes of powered flight in hover mode without payload. CSI's UAS's will not be able to meet the 30-minute reserve requirement in 14 CPR §91.151. Operating the small UAS's, 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 power, 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's.

CSI believes that an equivalent level of safety can be achieved by limiting flights to 10-15 minutes or 25% of battery power whichever happens first. This restriction would be more than adequate to return the UAS 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) & (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's fully loaded weigh no more than 5lbs. and are 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 UAS's. An equivalent level of safety will be achieved by keeping these documents at the ground control point where the pilot flying the UAS will have immediate access to them, to the extent they are applicable to the UAS's. The FAA has issued numerous exemptions to this regulation. A representative sample of other exceptions includes Exemption Nos. 9565, 9665, 9789, 9789A, 9797, 9797 A, 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. The operator, pursuant to the flight manual, will provide maintenance. An equivalent level of safety will be achieved because these small UAS's 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. CSI will ensure that the UAS is in working order prior to initiating flight and keep a log of any maintenance performed. Moreover, CSI's trained staff professionals are familiar with the aircraft and are best suited to maintain the aircraft in an airworthy condition to provide the equivalent level of safety.

Conditions and Limitations

CSI has reviewed the conditions and limitations given below from one of the recent Section 333 exemptions granted and we are willing to abide by the rules outlined below. New rules that are not listed below will also be followed if required for an exemption.

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

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

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

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

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

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

7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operating documents, 4 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. 5

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 UAS 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. 6

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.

Summary

Satisfaction of the criteria provided in Section 333 of the Reform Act - size, weight, speed, operating capabilities, proximity to airports and populated areas, operation within visual line of sight, and national security considerations - provides more than adequate justification for the grant of the requested exemptions to permit CSI to operate DJI Phantom 3 Professional and DJI Inspire 1 for commercial purposes.

Granting the requested exemption will benefit the public interest as a whole in many ways, including (1) significantly improving safety and reducing risk by alleviating human exposure to danger; (2) improving the quality of services CSI can provide to its customers; and (3) decreasing operating costs related to site investigation and inspection activities.

Jordan Keeney, EIT
Staff Professional

Bruce L. Hatcher, PE, SI
Chief Engineer

Consulting Services Incorporated of Kentucky,

Phantom 3 Professional-Aircraft

From DJI Wiki

Aircraft

Flight Controller

The Phantom 3 Professional's flight controller features several important upgrades, including a new flight mode. Safety modes include Failsafe and Return-to-Home. These features ensure the safe return of your aircraft if the control signal is lost. The flight controller can also save critical flight data from each flight to the on-board storage device. The new flight controller also provides increased stability and a new air braking feature.

Flight Mode

Three flight modes are available. The details of each flight mode are found below:

P-mode (Positioning) : P-mode works best when GPS signal is strong. There are three different states of P-mode, which will be automatically selected by the Phantom 3 Professional depending on signal strength of GPS and Vision Positioning sensors :

P-GPS: GPS and Vision Positioning both are available. The aircraft is using GPS for positioning.

P-OPTI: Vision Positioning is available but the GPS signal strength is not sufficient. The aircraft is using only the Vision Positioning System for positioning.

P-ATTI: Neither GPS nor Vision Positioning is available. The aircraft is using only its barometer for positioning, so only altitude can be stabilized.

A-mode (Attitude): GPS and Vision Positioning System are not used for stabilization. The aircraft only uses its barometer. The aircraft can still automatically return to the home point if the control signal is lost and the Home Point was recorded successfully.

F-mode (Function): Intelligent Orientation Control (IOC) is activated in this mode. For more information about IOC, refer to the IOC section in the Appendix.

Tips:

Use the Flight Controller mode switch to change the flight mode of the aircraft, refer to the "Flight Mode Switch" for more information.

Flight Status Indicator

The Phantom 3 Professional has Front LEDs and Aircraft Status Indicators. The positions of these LEDs are shown in the figure below:

The Front LEDs show the orientation of the aircraft. The Front LEDs glow solid red when the aircraft is turned on to indicate the front (or nose) of the aircraft. The Aircraft Status Indicators communicate the system status of the flight controller. Refer to the table below for more information about the Aircraft Status Indicators:

Aircraft Status Indicator Description

Normal	
(R)(G)(Y) ····· Red, Green and Yellow Flash Alternatively	Turning On and Self Diagnostic Testing
(G)(Y) ····· Green and Yellow Flash Alternatively	Warming Up
(G) ····· Green Flashes Slowly	Safe to Fly (P-mode with GPS and Vision Positioning)
(G) X2 ····· Green Flashes Twice	Safe to Fly (P-mode with Vision Positioning but without GPS)
(Y) ····· Yellow Flashes Slowly	Safe to Fly (A-mode but No GPS and Vision Positioning)
Warning	
(Y) ····· Fast Yellow Flashing	Remote Controller's Signal Lost
(R) ····· Slow Red Flashing	Low Battery Warning
(R) ····· Fast Red Flashing	Critical Battery Warning
(R) ····· Red Flashing Alternatively	IMU Error
(R) —— Solid Red	Critical Error
(R)(Y) ····· Red and Yellow Flash Alternatively	Compass Calibration Required

Return-to-Home (RTH)

The Return-to-Home (RTH) function brings the aircraft back to the last recorded Home Point. There are three types of RTH procedures: Smart RTH, Low Battery RTH, and Failsafe RTH. This section describes these three scenarios in detail.

	GPS	Description
Home Point		If a strong GPS signal was acquired before takeoff, the Home Point is the location from which the aircraft was launched. The GPS signal strength is indicated by the GPS icon ( ). The aircraft status indicator will blink rapidly when the home point is recorded.

Smart RTH

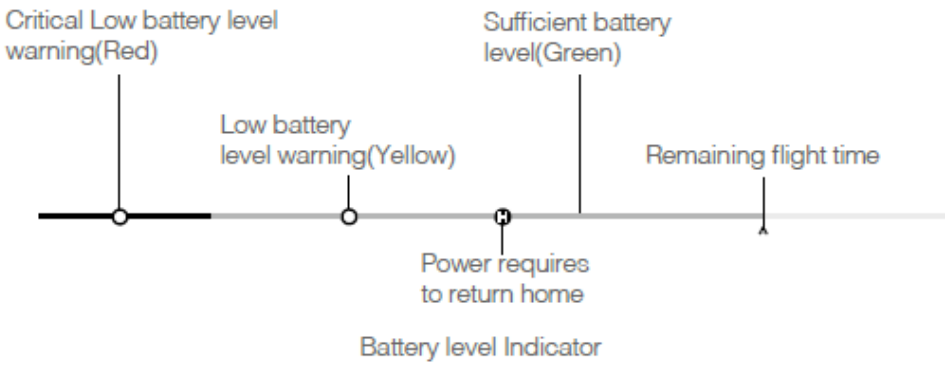
Use the RTH button on the remote controller or tap the RTH button in the DJI Pilot app and follow the on-screen instructions when GPS is available to initiate Smart RTH. The aircraft will then automatically return to the last recorded Home Point. You may use the remote controller's control sticks to control the aircraft's position to avoid a collision during the Smart RTH process. Press and hold the Smart RTH button once to start the process, and press the Smart RTH button again to terminate the procedure and regain full control of the aircraft.

Low Battery RTH

The low battery level failsafe is triggered when the DJI Intelligent Flight Battery is depleted to a point that may affect the safe return of the aircraft. Users are advised to return home or land the aircraft immediately when prompted. The DJI Pilot app will display a notice when a low battery warning is triggered. The aircraft will automatically return to the Home Point if no action is taken after a ten-second countdown. The user can cancel the RTH procedure by pressing the RTH button on the remote controller. The thresholds for these warnings are automatically determined based on the aircraft's current altitude and distance from the Home Point.

The aircraft will land automatically if the current battery level can only support the aircraft long enough to descend from its current altitude. The user can still use the remote controller to alter the aircraft's orientation during the landing process.

The Battery Level Indicator is displayed in the DJI Pilot app, and is described below:



Battery Level Warning	Remark	Aircraft Status Indicator	DJI Pilot app	Flight Instructions
Low battery level warning	The battery power is low. Please land the aircraft.	Aircraft status indicator blinks RED slowly.	Tap "Go-home" to have the aircraft return to the Home point and land automatically, or "Cancel" to resume normal flight. If no action is taken, the aircraft will automatically go home and land after 10 seconds. Remote controller will sound an alarm.	Fly the aircraft back and land it as soon as possible, then stop the motors and replace the battery.
Critical Low battery level warning	The aircraft must land immediately.	Aircraft status indicator blinks RED quickly.	The DJI Pilot app display will flash red and the aircraft will start to descend. The remote controller will sound an alarm.	Allow the aircraft to descend and land automatically.
Estimated remaining flight time	Estimated remaining flight based on current battery level.	N/A	N/A	N/A

Tips:

- When the Critical battery level warning is triggered and the aircraft begins to land automatically, you may push the throttle upward to make the aircraft hover at its current altitude, giving you an

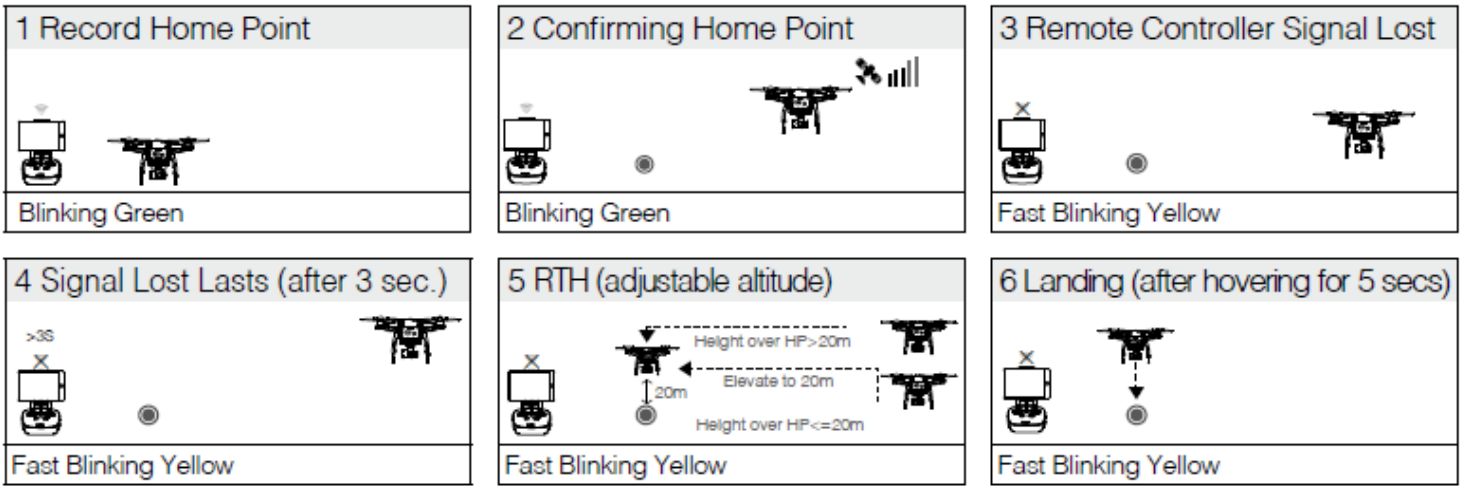
opportunity to navigate to a more appropriate landing location.

- The colored zones and markers on the battery level indicator bar reflect the estimated remaining flight time. They are automatically adjusted according to the aircraft's current location and status.

Failsafe RTH

If the Home Point was successfully recorded and the compass is functioning normally, Failsafe RTH will be automatically activated if the remote controller signal is lost for more than three seconds. The Returnto- Home process may be interrupted and the operator may regain control of the aircraft if the remote controller signal connection is re-established.

Failsafe Illustration

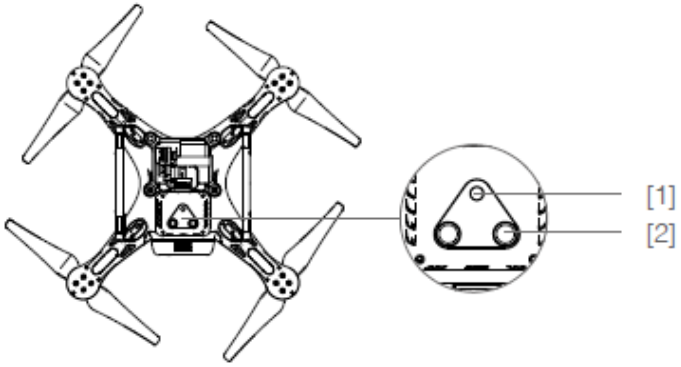


Notes:

- The aircraft cannot avoid obstruction during the Failsafe RTH, therefore, it is important to set an suitable Failsafe altitude before each flight. Launch the DJI Pilot app and enter “Camera” and select “MODE > Advanced Settings > Failsafe mode” to set the Failsafe altitude.
- The aircraft will stop its ascent and return to the Home Point immediately if the throttle stick is moved during the Failsafe RTH procedure.

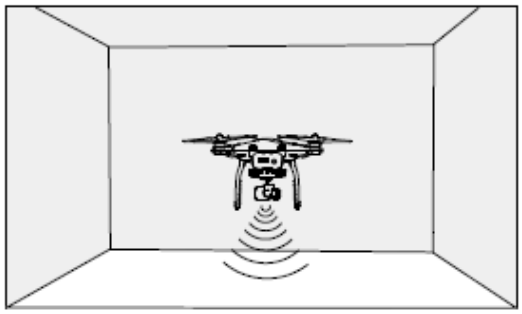
Vision Positioning System

The DJI Vision Positioning System uses ultrasound and image data to help the aircraft maintain its current position. With the help of Vision Positioning, your Phantom 3 Professional can hover in place more precisely and fly indoors or in other environments where a GPS signal is not available. The main components of the Vision Positioning System are located on the bottom of your Phantom 3 Professional; they include [2] two ultrasonic sensors and [1] one monocular camera.



Using Vision Positioning

Vision Positioning is activated automatically when the Phantom 3 Professional is turned on. No further action is required. Vision Positioning is typically used in indoor environments, where GPS is unavailable. Using the sensors that are built into the Vision Positioning system, the Phantom 3 Professional can hover precisely even without GPS.



Follow the steps below to use Vision Positioning:

1. Toggle the flight mode switch to P-mode. 

2. Place the aircraft on a flat surface. Note that the Vision Positioning system cannot work properly on surfaces without clear pattern variations.

3. Turn on the aircraft. The aircraft status indicator will flash green two times, which indicates the Vision Positioning system is ready. Gently push the throttle up to lift off and the aircraft will hover in place.

Notes:

The performance of your Vision Positioning System is affected by the surface over which it is flying. The ultrasonic sensors may not be able to accurately measure distances when operating above sound-absorbing materials. In addition, the camera may not function correctly in suboptimal environments. The aircraft will switch from P-mode to A-mode automatically if neither GPS nor Vision Positioning System are available. Operate the aircraft with great caution in the following situations:

- Flying over monochrome surfaces (e.g. pure black, pure white, pure red, pure green).
- Flying over a highly reflective surfaces.
- Flying at high speeds(over 8 m/s at 2 meters or over 4 m/s at 1 meter).
- Flying over water or transparent surfaces.
- Flying over moving surfaces or objects.
- Flying in an area where the lighting changes frequently or drastically.
- Flying over extremely dark (lux < 10) or bright (lux > 100,000) surfaces.
- Flying over surfaces that can absorb sound waves (e.g. thick carpet).
- Flying over surfaces without clear patterns or texture.
- Flying over surfaces with identical repeating patterns or textures (e.g. tiles with the same design).
- Flying over inclined surfaces that will deflect sound waves away from the aircraft.

Tips:

- Keep the sensors clean at all times. Dirt or other debris may adversely affect the effectiveness of the sensors.
- Vision Positioning is only effective when the aircraft is at altitudes of 0.3 to 3 meters.
- The Vision Positioning System may not function properly when the aircraft is flying over water.
- The Vision Positioning System may not be able to recognize pattern on the ground in low light conditions (less than 100 lux).
- Do not use other ultrasonic devices with frequency of 40 KHz when Vision Positioning system is in operation.
- Vision Positioning System may not be able to stabilize the aircraft when flying close to the ground (below 0.5 meters) at fast speeds.

Warning:

Keep animals away from the aircraft when Vision Positioning system is activated. The sonar sensor emits high frequency sounds that are only audible to some animals.

Flight Recorder

Flight data is automatically recorded to the internal storage of the aircraft. This includes flight telemetry, aircraft status information, and other parameters. To access these data, connect the aircraft to the PC through the Micro-USB port and launch the DJI Pilot app.

Attaching and Detaching the Propellers

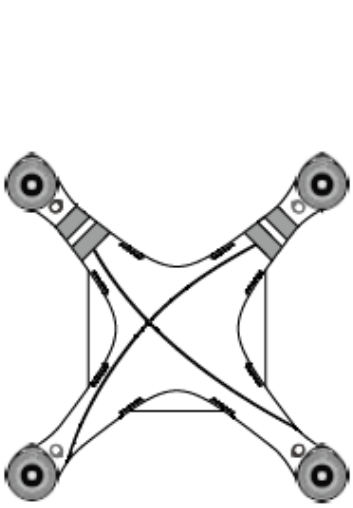
Use only DJI approved propellers with your Phantom 3 Professional. The grey and black nuts on the propeller indicate where they should be attached and in which direction whey should spin. To attach the propellers properly, match the nut color with the motor axis color.

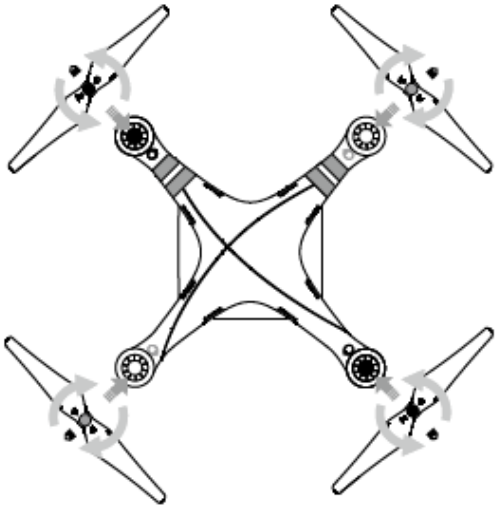
Propellers	Silver Dot	Black Dot
Figure		
Attach On	Motors with a grey axes	Motors with a black axes
Legends	Lock : Turn the propellers in the indicated direction to mount and tighten. Unlock : Turn the propellers in the indicated direction to loosen and remove.	

Attaching the Propellers

1. Be sure to remove the warning stickers from the motors before attaching the propellers.

2. Attach the propellers with silver dots onto the motors with silver axes and spin the propellers clockwise to secure them in place. Attach the propellers with black dots onto the motors with black axes and spin the propellers counter-clockwise to secure them in place. Be sure to tighten each propeller by hand before flight.





Notes:

- Ensure propellers are attached to its corresponding motors, otherwise the aircraft cannot take off.
- Wear gloves when handling propellers.
- Hand tighten each of the propellers on the corresponding motors to ensure it is attached firmly.

Detaching the Propellers

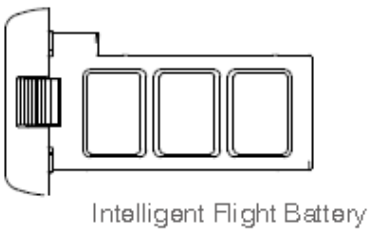
Hold the motor in place with one hand, then spin the propeller in the indicated unlock direction.

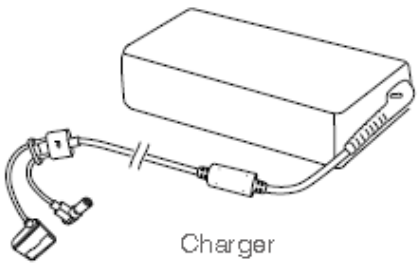
Notes:

- Check that the propellers and motors are installed correctly and firmly before every flight.
- Ensure that all propellers are in good condition before each flight. DO NOT use aged, chipped, or broken propellers.
- To avoid injury, STAND CLEAR of and DO NOT touch propellers or motors when they are spinning.
- ONLY use original DJI propellers for a better and safer flight experience.

DJI Intelligent Flight Battery

The DJI Intelligent Flight Battery has a capacity of 4480 mAh, a voltage of 15.2 V, and a smart charge/ discharge functionality. It should only be charged using an appropriate charger that has been approved by DJI..





Note:

The Intelligent Flight Battery must be fully charged before using it for the first time. Refer to "Charging the Intelligent Flight Battery" for more information.

Tips:

Be aware that the output power of the supplied Phantom 3 Professional charger is 100 W.

DJI Intelligent Flight Battery Functions

1. Battery Level Display: the LED indicators display the current battery level.

2. Battery Life Display: the LEDs display the current battery power cycle.

3. Auto-Discharging Function: To prevent swelling, the battery automatically discharges to below 65% of total power when it is idle for more than ten days. It takes around two days to discharge the battery to 65%. It is normal to feel moderate heat being emitted from the battery during the discharge process. Discharge thresholds can be set in the DJI Pilot app.

4. Balanced Charging: Automatically balances the voltage of each battery cell when charging.

5. Overcharge Protection: Charging automatically stops when the battery is fully charged.

6. Temperature Detection: The battery will only charge when the temperature is between 0°C (32°F) and 40°C (104°F).

7. Over Current Protection: The battery stops charging when high amperage (more than 8 A) is detected.

8. Over Discharge Protection: To prevent over-discharge damage, discharging automatically stops when the battery voltage reaches 12 V.

9. Short Circuit Protection: Automatically cuts the power supply when a short circuit is detected.

10. Battery Cell Damage Protection: The DJI Pilot app displays a warning message when a damaged battery cell is detected.

11. Battery Error History: Browse the battery error history in the DJI Pilot app.

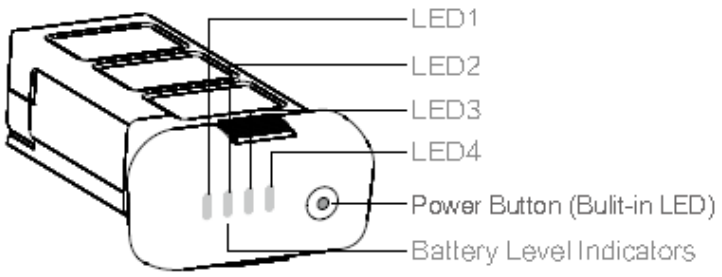
12. Sleep mode: To save power, the battery enters sleep mode after 20 minutes of inactivity.

13. Communication: Information pertaining to the battery's voltage, capacity, current, etc. is transmitted to the aircraft's main controller.

Notes:

Refer to Phantom 3 Professional / Advanced Intelligent Flight Battery Safety Guidelines before use. Users take full responsibility for all operations and usage.

Using the Battery



Turning ON/OFF

Turning On: Press the Power Button once, then press again and hold for 2 seconds to turn on. The Power LED will turn red and the Battery Level Indicators will display the current battery level.

Turning Off: Press the Power Button once, then press again and hold for 2 seconds to turn off. The battery power LED will flash when powering off the Phantom to allow automatically stopping of a recording during the event recording wasn't stopped.

Low Temperature Notice:

1. Battery capacity is significantly reduced when flying in low temperature (< 0°C) environments.

2. It is not recommended that the battery be used in extremely low temperature (< -10°C) environments. Battery voltage should reach the appropriate level when operating environment with temperatures between -10°C and 5°C.

3. End the flight as soon as the DJI Pilot app displays the "Low Battery Level Warning" in low temperature environments.

4. Keep the battery indoors to warm it before flying in low temperature environments.

5. To ensure optimal performance of the battery, keep the battery temperature above 20°C.

6. The charger will stop charging the battery if the battery cell's temperature is not within the operating range (0°C ~ 40°C).

Notes:

In cold environments, insert the battery into the battery compartment and allow the aircraft for approximately 1-2 minutes to warm up before taking off.

Checking the Battery Level

The Battery Level Indicators display how much power remains. When the battery is turned off, press the Power Button once. The Battery Level Indicators will light up to display the current battery level. See below for details.

Refference:

The Battery Level Indicators will also show the current battery level during charging and discharging. The indicators are defined below.

: LED is on. : LED is flashing.
: LED is off.

Battery Level				
LED1	LED2	LED3	LED4	Battery Level
▯	▯	▯	▯	87.5%~100%
▯	▯	▯	▮	75%~87.5%
▯	▯	▯	▯	62.5%~75%
▯	▯	▮	▯	50%~62.5%
▯	▯	▯	▯	37.5%~50%
▯	▮	▯	▯	25%~37.5%
▯	▯	▯	▯	12.5%~25%
▮	▯	▯	▯	0%~12.5%
▯	▯	▯	▯	=0%

Battery life

Battery life refers to how many more times the battery can be discharged and recharged before it must be replaced. When the battery is turned off, press and hold the Power Button for 5 seconds to check the battery life. The Battery Level Indicators will light up and/or blink for two seconds, as shown below:

Battery Life				
LED1	LED2	LED3	LED4	Battery Life
▯	▯	▯	▯	90%~100%
▯	▯	▯	▮	80%~90%
▯	▯	▯	▯	70%~80%
▯	▯	▮	▯	60%~70%
▯	▯	▯	▯	50%~60%
▯	▮	▯	▯	40%~50%
▯	▯	▯	▯	30%~40%
▮	▯	▯	▯	20%~30%
▯	▯	▯	▯	below 20%

Notes:

When battery life reaches 0%, it can no longer be used.

Refference:

For more information about the battery, launch the DJI Pilot app and check the information that is listed under the battery tab.

Charging the Intelligent Flight Battery

1. Connect the Battery Charger to a power source (100-240 V 50/60 Hz).

2. Open the Protection Cap and connect the Intelligent Flight Battery to the Battery Charger. If the battery level is above 95%, turn on the battery before charging.

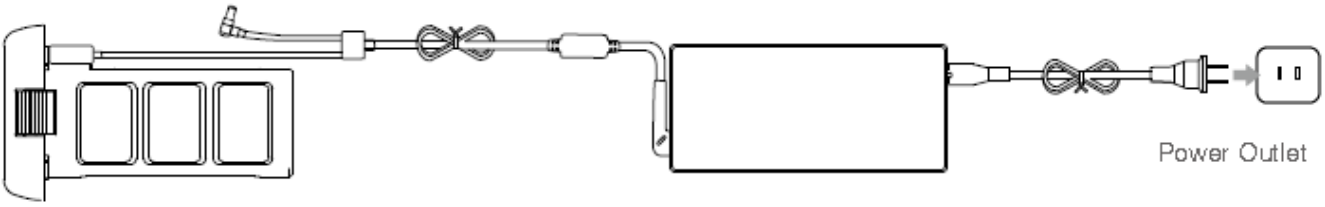
3. The Battery Level Indicator will display the current battery level as it is charging.

4. The Intelligent Flight Battery is fully charged when the Battery Level Indicators are all off.

5. Air-cool the Intelligent Flight Battery after each flight. Allow its temperature to drop to room temperature before storing it for an extended period.

Notes:

- We do not recommend charging the Intelligent Flight Battery and remote controller with the standard charger at the same time, otherwise the charger may overheat.
- Always turn off the battery before inserting it or removing it from the Phantom 3 Professional. Never insert or remove a battery when it is turned on.



Battery Level Indicators While Charging				
LED1	LED2	LED3	LED4	Battery Level
☼	○	○	○	0%~25%
☼	☼	○	○	25%~50%
☼	☼	☼	○	50%~75%
☼	☼	☼	☼	75%~100%
○	○	○	○	Fully Charged

Battery Protection LED Display

The table below shows battery protection mechanisms and corresponding LED patterns.

Battery Level Indicators while Charging					
LED1	LED2	LED3	LED4	Blinking Pattern	Battery Protection Item
○	◎	○	○	LED2 blinks twice per second	Over current detected
○	◎	○	○	LED2 blinks three times per second	Short circuit detected
○	○	◎	○	LED3 blinks twice per second	Over charge detected
○	○	◎	○	LED3 blinks three times per second	Over-voltage charger detected
○	○	○	◎	LED4 blinks twice per second	Charging temperature is too low
○	○	○	◎	LED4 blinks three times per second	Charging temperature is too high

After these issues are resolved, press the Power Button to turn off the Battery Level Indicator. Unplug the Intelligent Flight Battery from the charger and plug it back in to resume charging. Note that you do not need to unplug and plug in the charger in the event of a room temperature error; the charger will resume charging when the temperature is within the allowable range.

Notes:

DJI does not take any responsibility for damage caused by third-party chargers.

Tips:

How to discharge your Intelligent Flight Battery:

Slow : Place the Intelligent Flight Battery into the Phantom 3 Professional's Battery Compartment and turn it on. Leave it on until there is less than 8% of power left, or until the battery can no longer be turned on. Launch the DJI Pilot app to check battery levels.

Rapid : Fly the Phantom 3 Professional outdoors until there is less than 8% of power left, or until the battery can no longer be turned on.

Phantom 3 Professional-Remote Controller

From DJI Wiki

Remote Controller

Remote Controller Profile

The Phantom 3 Professional remote controller is a multi-function wireless communication device that integrates the video downlink system and aircraft remote control system. The video downlink and aircraft remote control system operate at 2.4 GHz. The remote controller features a number of camera control functions, such as taking and previewing photos and videos, as well as controlling gimbal motion. The remote controller is powered by a 2S rechargeable battery. The battery level is displayed via LED indicators on the front panel of the remote controller.

Refferences:

- Compliance Version: The remote controller is compliant with both CE and FCC regulations.
- Operating Mode: Control can be set to Mode 1 or Mode 2, or to a custom mode.
- Mode 1: The right stick serves as the throttle.
- Mode 2: The left stick serves as the throttle.

Note: To prevent transmission interference, do not operate more than three aircrafts.

Using the Remote Controller

Turning the Remote Controller On and Off

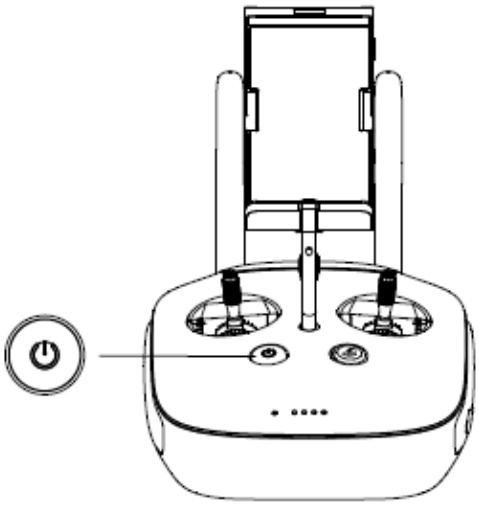
The Phantom 3 Professional remote controller is powered by a 2S rechargeable battery that has a capacity of 6000 mAh. The battery level is indicated via the Battery Level LEDs on the front panel. Follow the steps below to turn on your remote controller:

1. When the remote controller is turned off, press the Power Button once. The Battery Level LEDs will display the current battery level.

2. Press and hold the Power Button to turn on the remote controller.

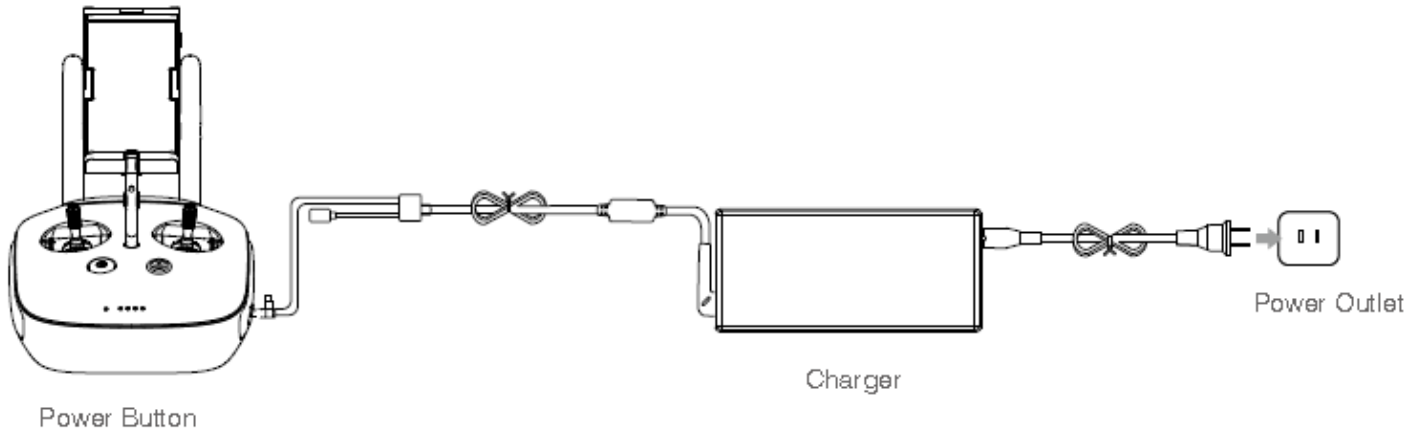
3. The remote controller will beep when it is turned on. The Status LED will rapidly blink green, indicating that the remote controller is linking to the aircraft. The Status LEDs will glow solid green when linking is complete.

4. Repeat Step 2 to turn off the remote controller.



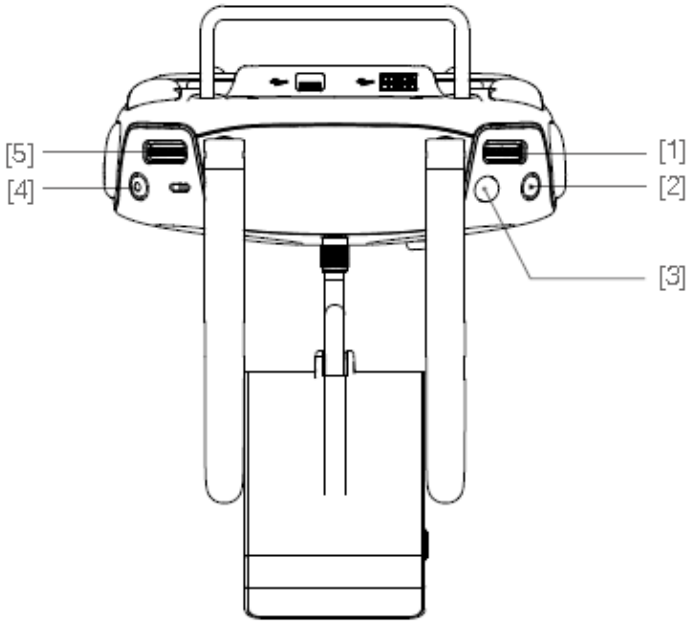
Charging the Remote Controller

Charge the remote controller using the included charger. Refer to the figure on next page below for more details.



Controlling the Camera

Shoot videos/pictures, view recorded images, and adjust camera settings via the Shutter Button, Camera Settings Dial, Playback Button, and Video Recording Button on the remote controller.



[1] Camera Settings Dial

Turn the dial to adjust camera settings such as ISO, shutter speed, and aperture without letting go of the remote controller. Move the dial to left or right to scroll through pictures and videos in playback mode. Press down on the dial to toggle between these settings.

[2] Playback Button

Press to view images and videos that have already been captured.

[3] Shutter Button Press to take a photo. If burst mode is activated, multiple photos will be taken with a single press.

[4] Video Recoding Button

Press once to start recording video, then press again to stop recording.

[5] Gimbal Dial

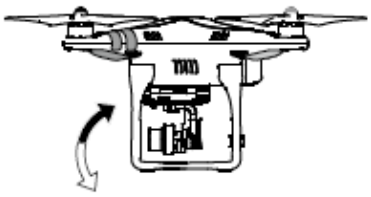
Use this dial to control the tilt of the gimbal.

Controlling Aircraft

This section explains how to control the orientation of the aircraft through the remote controller. The Remote Control is set to Mode 2 by default.

Refference:

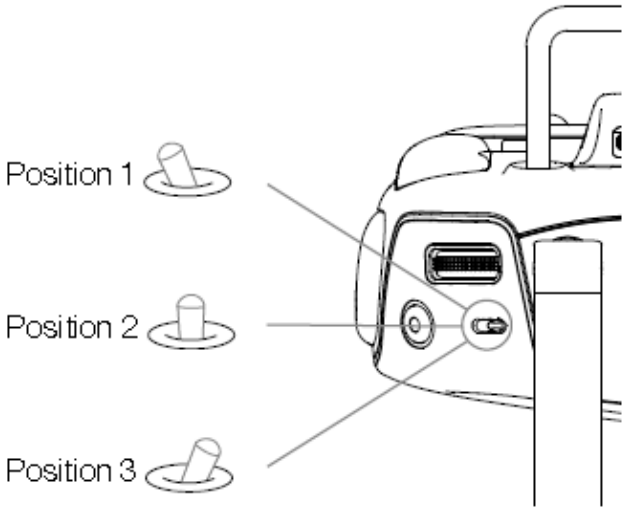
Stick Neutral/Mid-Point: Control sticks are in the center position. Moving the Control Stick: The control stick is pushed away from the center position.

Remote Controller (Mode 2)	Aircraft (● Indicates Nose Direction)	Remarks
		Moving the left stick up and down changes the aircraft's elevation. Push the stick up to ascend and down to descend. When both sticks are centered, the Phantom 3 Advanced will hover in place. The more the stick is pushed away from the center position, the faster the Phantom 3 Advanced will change elevation. Always push the stick gently to prevent sudden and unexpected elevation changes.
		Moving the left stick to the left or right controls the rudder and rotation of the aircraft. Push the sick left to rotate the aircraft counter-clockwise, push the stick right to rotate the aircraft clockwise. If the stick is centered, the Phantom 3 Advanced will maintain its current orientation. The more the stick is pushed away from the center position, the faster the Phantom 3 Advanced will rotate.
		Moving the right stick up and down changes the aircraft's forward and backward pitch. Push the stick up to fly forward and down to fly backward. Phantom 3 Advanced will hover in place if the stick is centered. Push the stick further away from the center position for a larger pitch angle (maximum 30°) and faster flight.
		Moving the right stick control left and right changes the aircraft's left and right pitch. Push left to fly left and right to fly right. The Phantom 3 Advanced will hover in place if the stick is centered.
		Gimbal Dial: Turn the dial to the right, and the camera will shift to point upwards. Turn the dial to the left, and the camera will shift to point downwards. The camera will remain in its current position when dial is static.

Flight Mode Switch

Toggle the switch to select the desired flight mode.You may choose between; P-mode, F-mode and Amode.

Position	Figure	Flight Mode
Position 1		F-mode
Position 2		A-mode
Position 3		P-mode



P-mode (Positioning): P-mode works best when the GPS signal is strong. There are three different versions of P-mode, which will be automatically selected by the Phantom 3 Professional depending on GPS signal strength and the Vision Positioning sensors:

P-GPS: GPS and Vision Positioning both are available; the aircraft is using GPS for positioning.

P-OPTI: Vision Positioning is available but a sufficient GPS signal is not available. Aircraft is using only Vision Positioning for position holding.

P-ATTI: Neither GPS nor Vision Positioning is available, the aircraft is using only its barometer for positioning, so only altitude is maintained.

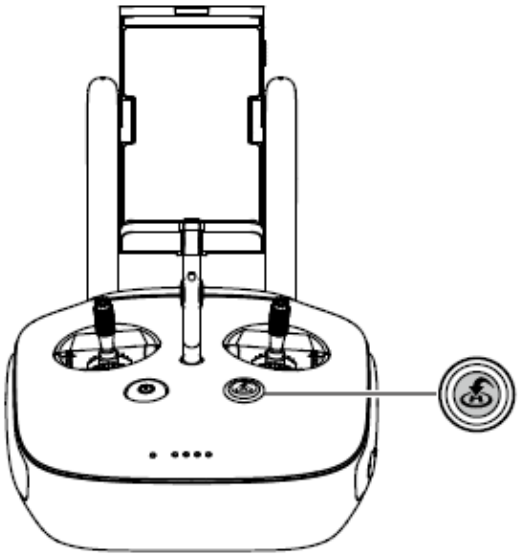
A-mode (Attitude): GPS and Vision Positioning System are not used for stabilization. The aircraft uses only its barometer to stabilize. The aircraft can automatically return to the Home Point if remote controller signal is lost and the Home Point was recorded successfully.

F-mode (Function): Intelligent Orientation Control (IOC) is activated in this mode. For more information about IOC, refer to the IOC section in the Appendix.

By default, the Flight Mode Switch is locked to P-mode. To unlock other flight modes, launch the DJI Pilot app, enter the “Camera” page, and tap “Mode”, then activate “Multiple Flight Mode”.

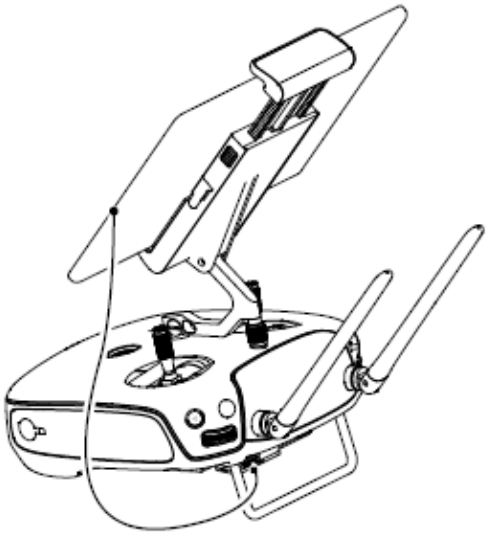
RTH Button

Press and hold the RTH button to start the Return-to-Home (RTH) procedure. The LED ring around the RTH Button will blink white to indicate that the aircraft is entering RTH mode. The aircraft will then return to the last recorded Home Point. Press this button again to cancel the RTH procedure and regain control of the aircraft.



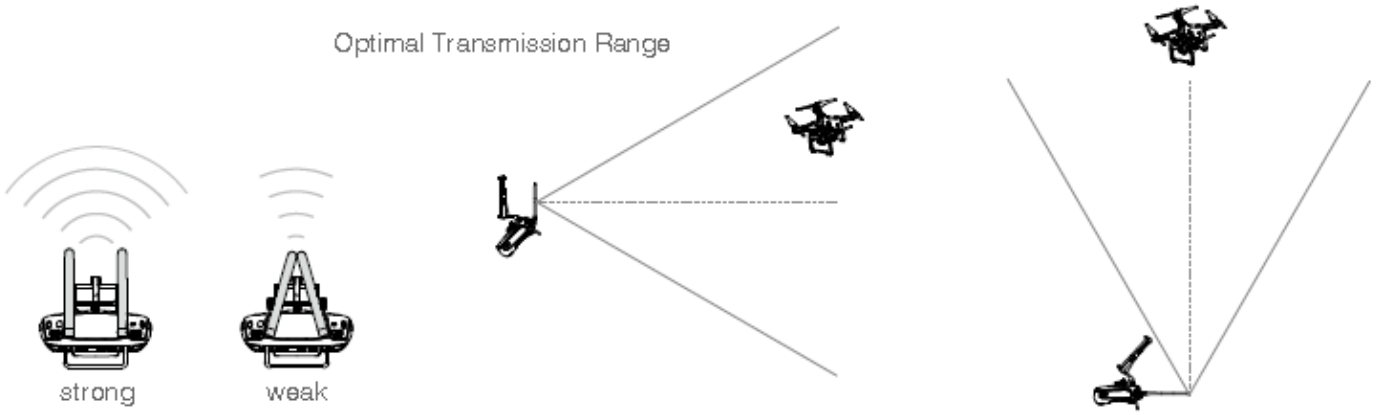
Connecting Your Mobile Device

Tilt the mobile device holder to the desired position. Press the button on the side of the mobile device holder to release the clamp, and then place your mobile device into the cradle. Adjust the clamp down to secure the mobile device. To connect your mobile device to the remote controller using a USB cable, plug one end of the cable into your mobile device and the other end into the USB port on the back of the remote controller.



Optimal Transmission Range

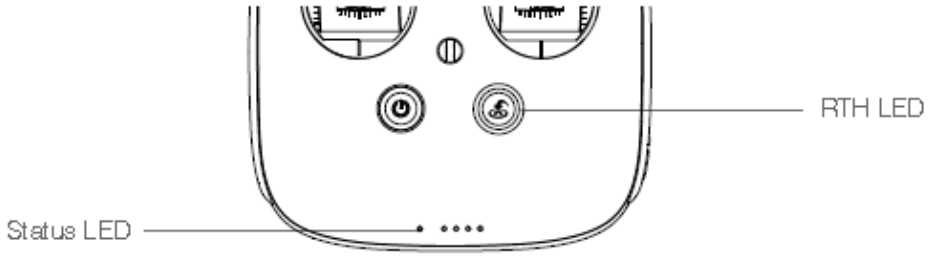
The transmission signal between the aircraft and the remote controller is most reliable within the area that is depicted in the image below:



Ensure that the aircraft is flying within the optimal transmission zone. To achieve the best transmission performance, maintain the appropriate relationship between the operator and the aircraft.

Remote Controller Status LED

The Status LED reflects the strength of the connection between the remote controller and the aircraft. The RTH LED indicates the Return-to-Home status of the aircraft. The table below contains more information about these indicators.



Status LED	Alarm	Remote Controller Status
Ⓡ —— Solid Red	♪ Chime	The remote controller is disconnected from the aircraft.
Ⓖ —— Solid Green	♪ Chime	The remote controller is connected to the aircraft.
Ⓡ ····· Slow Blinking Red	D-D-D·····	Remote controller error.
ⓇⒼ/ⓇⓎ ····· Red and Green/ Red and Yellow Alternate Blinks	None	HD downlink is disrupted.
RTH LED	**Sound**	**Remote Controller Status**
Ⓦ —— Solid White	♪ Chime	Aircraft is returning home.
Ⓦ ····· Blinking White	D · · ·	Sending Return-to-Home command to the aircraft.
Ⓦ ····· Blinking White	DD ·· ·· ··	Return-to-Home procedure in progress.

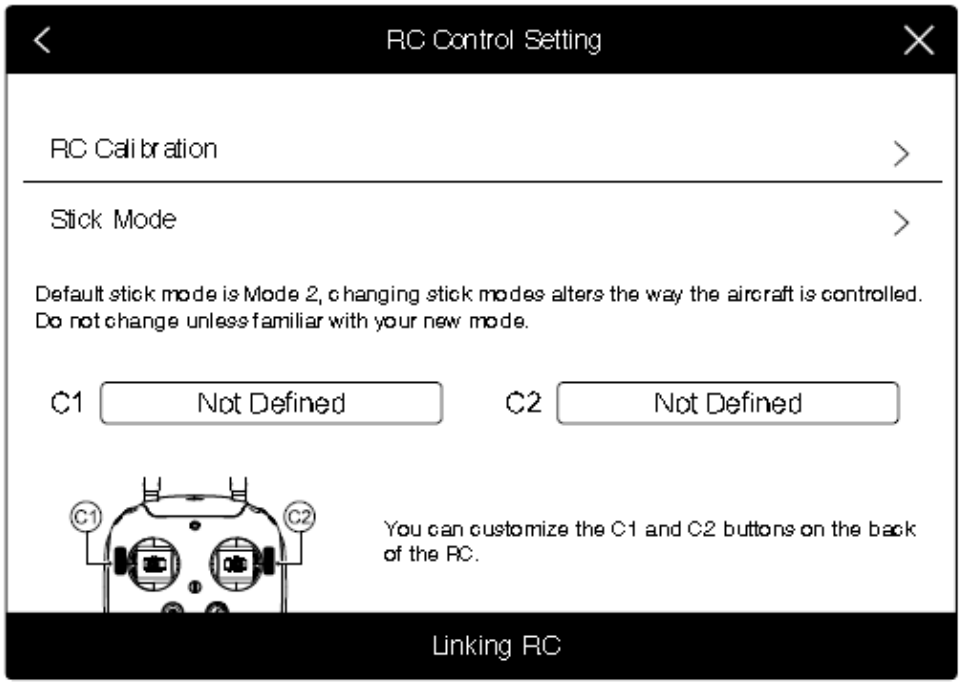
⚠ The Remote Status Indicator will blink red and sound an alert, when the battery level is critically low.

Linking the Remote Controller

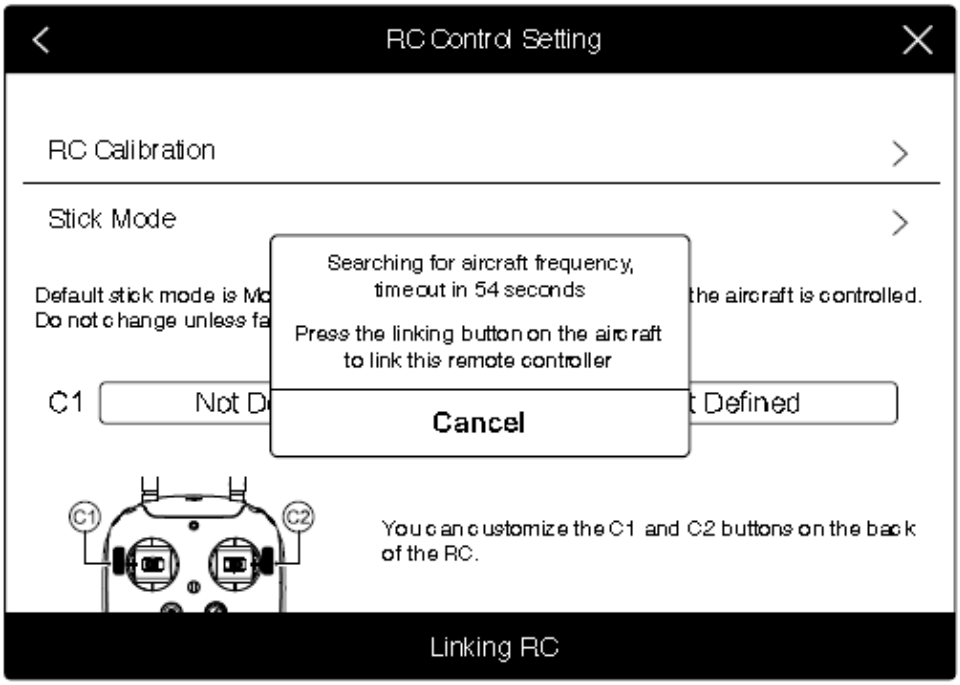
The remote controller is linked to your aircraft before delivery. Linking is only required when using a new remote controller for the first time. Follow these steps to link a new remote controller: 1. Turn on the remote controller and connect to the mobile device. Launch the DJI Pilot app.

2. Turn on the Intelligent Flight Battery.

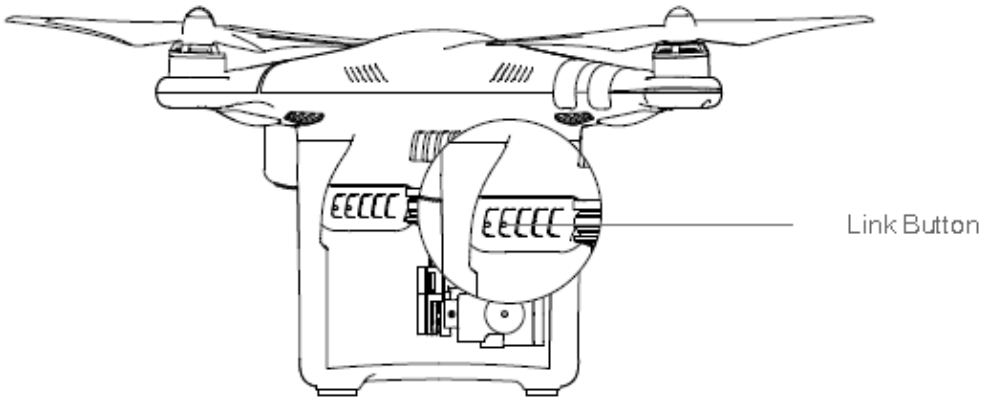
3. Enter “Camera” and tap on  and then tap “Linking RC” button as shown below.



4. The remote controller is ready to link. The Remote Controller Status Indicator blinks blue and a beep is emitted.



5. Locate the linking button on the side of the aircraft, as shown in the figure below. Press the link button to start linking. The Remote Controller Status Indicator LED will display a solid green once the remote controller is successfully linked to the aircraft.



Note:

- The remote controller will un-link itself from an aircraft if a new remote controller is linked to the same aircraft.

Remote Controller Compliance Version

The remote controller is compliant with both CE and FCC requirements.

Phantom 3 Professional- Flight Test

From DJI Wiki

Flight Test

Takeoff/Landing Procedures

1. Place the aircraft in an open, flat area with the battery level indicators facing towards you.

2. Turn on the remote controller and your mobile device, then turn on the Intelligent Flight Battery.

3. Launch the DJI Pilot app and enter the Camera page.

4. Wait until the Aircraft Indicators blink green. This means the Home Point is recorded and it is now safe to fly. If they flash yellow, the Home Point has not been recorded.

5. Push the throttle up slowly to take off or use Auto Takeoff.

6. Shoot photos and videos using the DJI Pilot app.

7. To land, hover over a level surface and gently pull down on the throttle to descend.

8. After landing, execute the CSC command or hold the throttle at its lowest position until the motors stop.

9. Turn off the Intelligent Flight Battery first, then the Remote Controller.

Notes:

- When the Aircraft Status Indicators blink yellow rapidly during flight, the aircraft has entered Failsafe mode.
- A low battery level warning is indicated by the Aircraft Status Indicators blinking red slowly or rapidly during flight.
- Watch our video tutorials for more flight information.

Video Suggestions and Tips

1. Go through the full pre-flight checklist before each flight.

2. Select the desired gimbal operation mode in the DJI Pilot app.

3. Only shoot video when flying in P-mode.

4. Always fly in good weather and avoid flying in rain or heavy wind.

5. Choose the camera settings that suit your needs. Settings include photo format and exposure compensation.

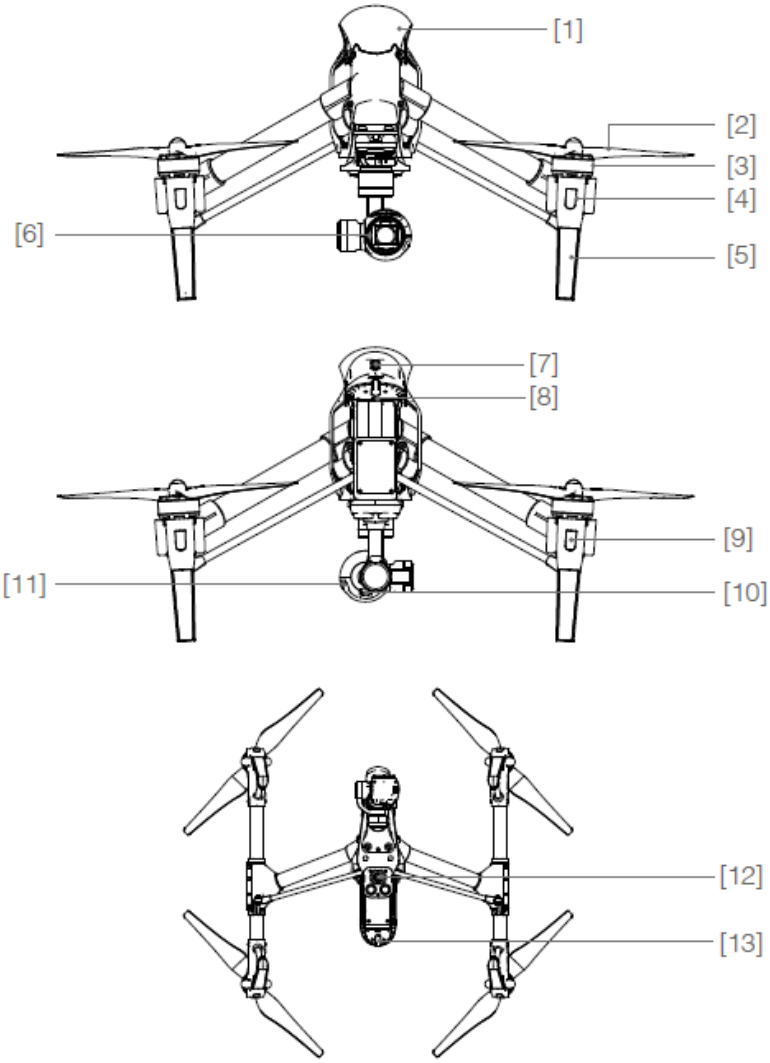
6. Perform flight tests to establish flight routes and preview scenes.

7. Push the control sticks gently to keep the aircraft's movement smooth and stable.

Inspire 1-Aircraft Diagram

From DJI Wiki

Aircraft Diagram



[1] GPS

[2] Propeller (P17)

[3] Motor

[4] Front LED (P12)

[5] Landing gear

[6] Gimbal and Camera (P37)

[7] Intelligent Flight Battery (P18)

[8] Aircraft Micro-USB Port

[9] Rear LED (P12)

[10] Camera Micro-USB Port

[11] Camera Micro-SD Card Slot (P35)

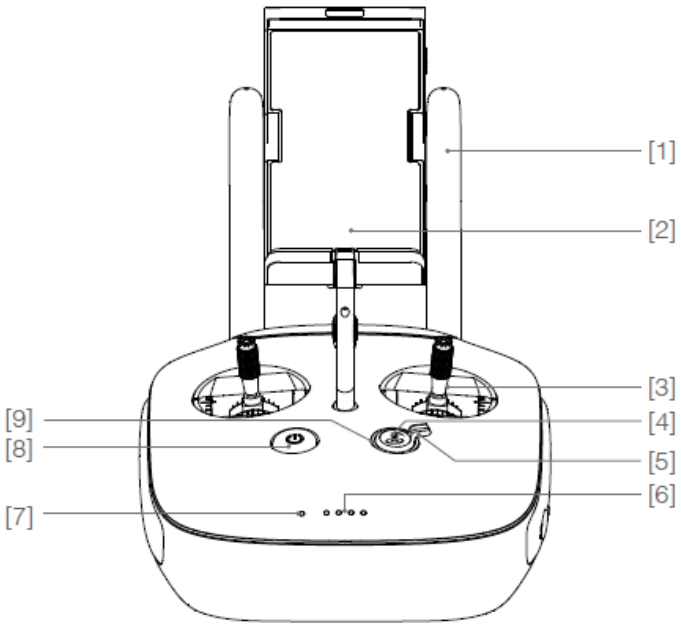
[12] Vision Positioning Sensors (P16)

[13] Aircraft Status Indicator (P13)

Inspire 1-Remote Controller Diagram

From DJI Wiki

Remote Controller Diagram



[1] Antennas (P29)

Relays aircraft control and video signal.

[2] Mobile Device Holder

Mounting place for your mobile device.

[3] Control Stick

Controls aircraft orientation.

[4] Return Home (RTH) Button (P13)

Press and hold the button to initiate Return to Home (RTH).

[5] Transformation Switch (P27)

Toggle the switch up or down to raise or lower the landing gear.

[6] Battery Level LEDs

Displays the current battery level.

[7] Status LED

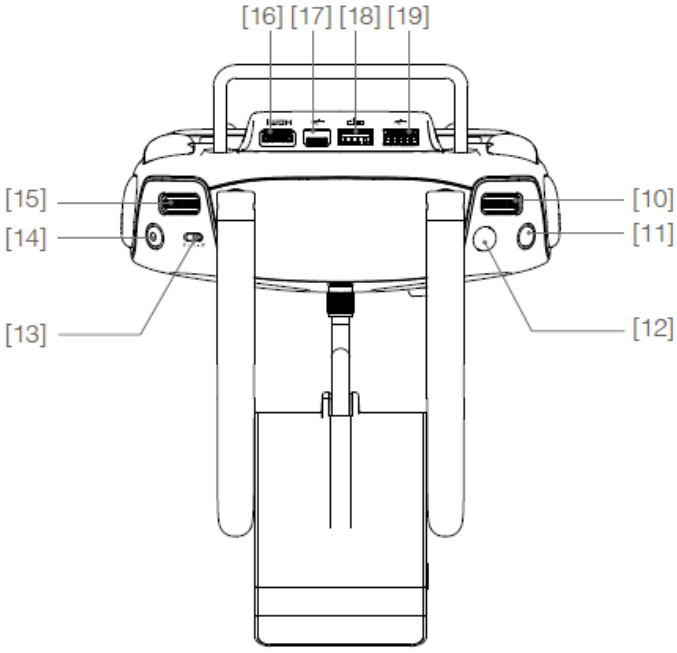
Displays the power status.

[8] Power Button

Used to power on or power off the remote controller.

[9] RTH LED

Circular LED around the RTH button displays RTH status.



[10] Camera Settings Dial

Turn the dial to adjust camera settings. Only functions when the remote controller is connected to a mobile device running the DJI Pilot app.

[11] Playback Button

Playback the captured images or videos.

[12] Shutter Button

Press to take a photo. If in burst mode, the set number of photos will be taken with one press.

[13] Flight Mode Switch

Used to switch between P, A and F mode.

[14] Video Recording Button

Press to start recording video. Press again to

stop recording.

[15] Gimbal Dial

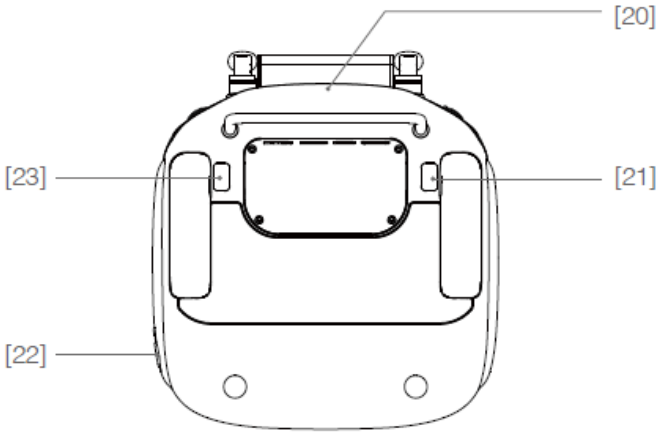
Use this dial to control the tilt of the gimbal.

[16] Micro-USB Port

For connecting the remote controller to your computer.

[17] Mini-HDMI Port

Connect an HD compatible monitor to this port to get a live HD video preview of what the camera sees.



[18] CAN Bus Port

Reserved for future use.

[19] USB Port

Connect to mobile device to access all of the DJI Pilot app controls and features.

[20] GPS Module

Used to pinpoint the location of the remote controller.

[21] Back Left Button

Customizable button in DJI Pilot app.

[22] Power Port

Connect to a power source to charge the remote controller's internal battery.

[23] Back Right Button

Customizable button in DJI Pilot app.

Inspire 1-Flight Limits and Flight Restriction Area

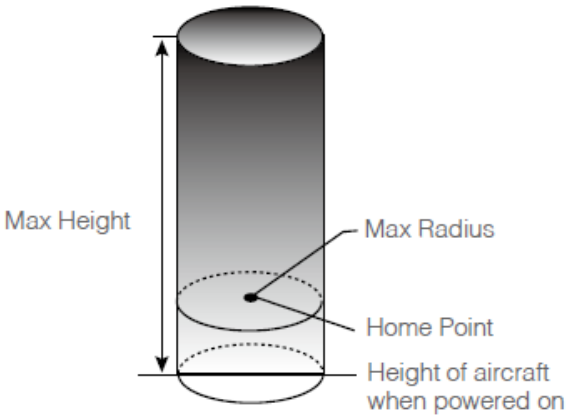
From DJI Wiki

Flight Limits and Flight Restriction Area

Flight limits on height and distance can be set. The details of these flight limits are described in the following section. All unmanned aerial vehicle (UAV) operators should abide by all regulations from such organizations as the ICAO (International Civil Aviation Organization), FAA and their own national airspace regulations. For safety reasons, the flight limits function is enabled by default to help users use this product safely and legally. The flight limits function includes height limits, distance limits and No Fly Zones. When operating in P Mode, height, distance limits and No Fly Zones work together to manage flight. In A mode only height limits work and flights cannot go higher than 120 meters.

Max Height & Radius Limits

Max Height & Radius limit flying height and distance, and the user may change these settings in the DJI Pilot App. Once complete, your Inspire 1 will fly in a restricted cylinder that is determined by these settings. The tables below show the details of these limits.



GPS Signal Strong ····· Blinking Green			
	Flight Limits	DJI Pilot App	Aircraft Status Indicator
Max Height	Flight altitude must be under the set height.	Warning: Height limit reached.	None.
Max Radius	Flight distance must be within the max radius.	Warning: Distance limit reached.	Rapid red flashing ····· when close to the max radius limit.

GPS Signal Weak ····· Blinking Yellow			
	Flight Limits	DJI Pilot App	Aircraft Status Indicator
Max Height	Flight height restricted to 120m and under.	Warning: Height limit reached.	None.
Max Radius	No limits		

Note:

- If you fly out of the limit, you can still control the Inspire 1, but cannot fly it further.
- If the Inspire 1 flies out of the max radius in Ready to Fly (non-GPS) mode, it will fly back within range automatically.

Flight Restriction of Restricted Areas

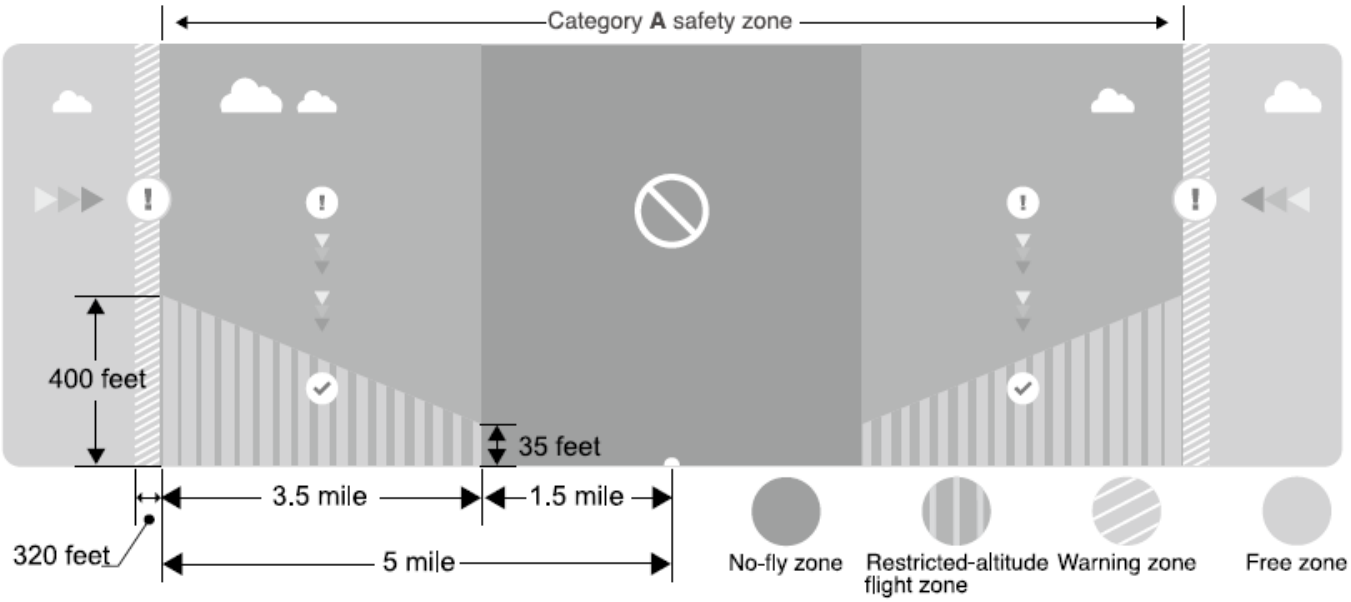
Restricted areas include airports worldwide. All restricted areas are listed on the DJI official website at http://www.dji.com/fly-safe/category-mc. Restricted areas are divided into category A and category B. Category A areas cover major international airport such as LAX and Heathrow, while category B areas includes smaller airports.

Category A Safety Zone

(1) The category A “safety zone” is comprised of a small “no-fly zone” and a range of “restricted-altitude zones”. Flight is prevented in the “no-fly zone” but can continue with height restrictions in the restricted-altitude zone. (2) 1.5 miles (2.4 km) around a designated safety zone is a no-fly zone, inside which takeoff is prevented.

(3) 1.5 miles (2.4 km) to 5 miles (8 km) around restricted areas are altitude restricted, with maximum altitude going from 35 feet (10.5 m) at 1.5 miles (2.4 km) to 400 feet (120 m) at 5 miles (8 km).

(4) A “warning zone” has been set around the safety zone. When you fly within 320 feet (100m) of the safety zone, a warning message will appear on the DJI Pilot App.

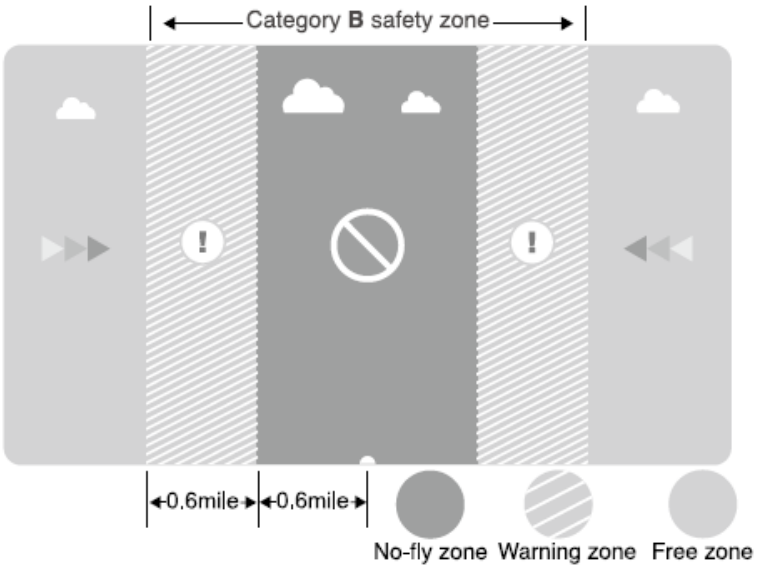


Category B Safety Zone

(1) Category B “safety zone” is comprised of a “no-fly zone” and a “warning zone”.

(2) 0.6 miles (1 km) around the safety zone is a designated “no-fly zone”.

(3) A “warning zone” has been set around the safety zone. When you fly within 0.6 miles (1Km) of this zone, a warning will appear on the DJI Pilot App.



GPS Signal Strong G ····· Blinking Green			
Zone	Restriction	DJI Pilot App Prompt	Aircraft Status Indicator
No-fly Zone	Motors will not start.	Warning: You are in a No-fly zone. Take off prohibited.	R ····· Red flashing
	If the aircraft enters the restricted area in A mode but P mode activates the aircraft will automatically descend to land then stop its motors after landing.	Warning: You are in a No-fly zone, automatic landing has begun. (If you are within 1.5 mile radius)	
Restricted-altitude flight zone	If the aircraft enters the restricted area in A mode but P mode activates, it will descend to a safe altitude and hover 15 feet below the safe altitude.	Warning: You are in a restricted zone. Descending to safe altitude. (If you are between the range of 1.5 mile and 5 mile radius) Warning: You are in a restricted zone. Max flight height restricted to between 10.5m and 120m. Fly Cautiously.	
Warning zone	No flight restriction applies, but there will be warning message.	Warning: You are approaching a restricted zone, Fly Cautiously.	
Free zone	No restrictions.	None.	None.

Reference:

Semi-automatic descent: All stick commands are available except the throttle stick command during the descent and landing process. Motors will stop automatically after landing.

Note:

- When flying in the safety zone, aircraft status indicator will blink red quickly and continue for 3 seconds, then switch to indicate current flying status and continue for 5 seconds at which point it will switch back to red blinking.
- For safety reasons, please do not fly close to airports, highways, railway stations, railway lines, city centers and other special areas. Try to ensure the aircraft is visible.

Inspire 1-Flight Limits and Flight Restriction Area

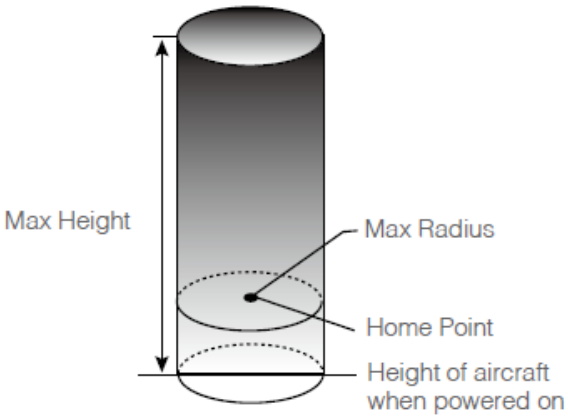
From DJI Wiki

Flight Limits and Flight Restriction Area

Flight limits on height and distance can be set. The details of these flight limits are described in the following section. All unmanned aerial vehicle (UAV) operators should abide by all regulations from such organizations as the ICAO (International Civil Aviation Organization), FAA and their own national airspace regulations. For safety reasons, the flight limits function is enabled by default to help users use this product safely and legally. The flight limits function includes height limits, distance limits and No Fly Zones. When operating in P Mode, height, distance limits and No Fly Zones work together to manage flight. In A mode only height limits work and flights cannot go higher than 120 meters.

Max Height & Radius Limits

Max Height & Radius limit flying height and distance, and the user may change these settings in the DJI Pilot App. Once complete, your Inspire 1 will fly in a restricted cylinder that is determined by these settings. The tables below show the details of these limits.



GPS Signal Strong ····· Blinking Green			
	Flight Limits	DJI Pilot App	Aircraft Status Indicator
Max Height	Flight altitude must be under the set height.	Warning: Height limit reached.	None.
Max Radius	Flight distance must be within the max radius.	Warning: Distance limit reached.	Rapid red flashing ····· when close to the max radius limit.

GPS Signal Weak ····· Blinking Yellow			
	Flight Limits	DJI Pilot App	Aircraft Status Indicator
Max Height	Flight height restricted to 120m and under.	Warning: Height limit reached.	None.
Max Radius	No limits		

Note:

- If you fly out of the limit, you can still control the Inspire 1, but cannot fly it further.
- If the Inspire 1 flies out of the max radius in Ready to Fly (non-GPS) mode, it will fly back within range automatically.

Flight Restriction of Restricted Areas

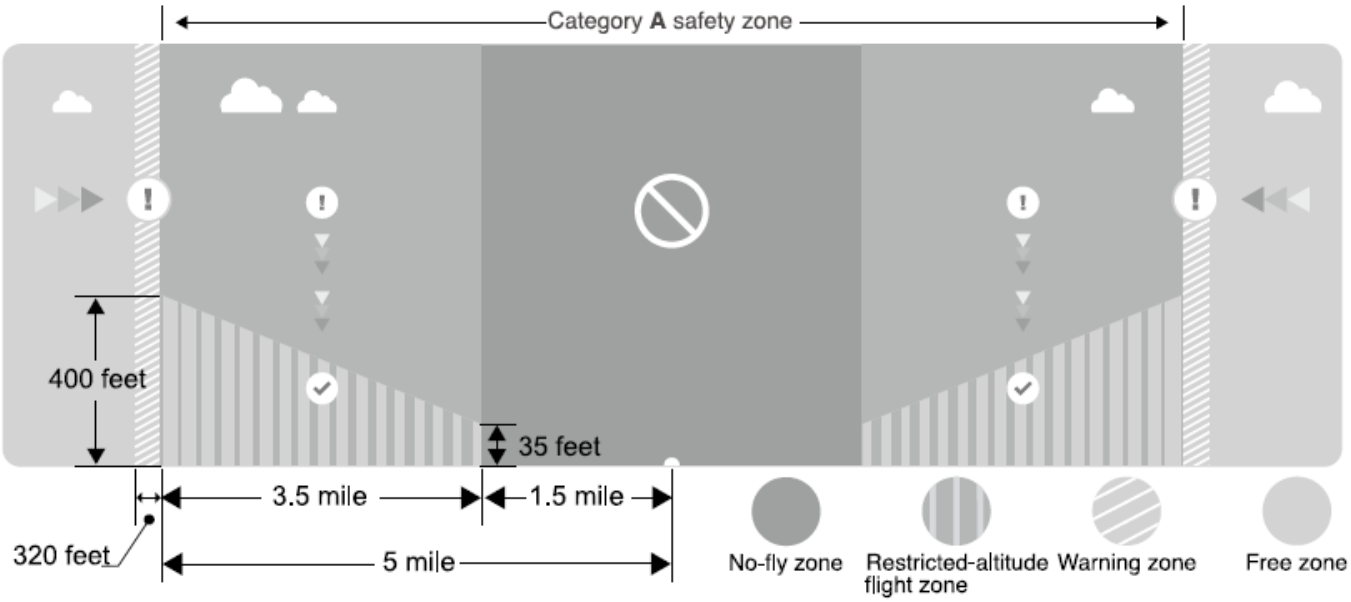
Restricted areas include airports worldwide. All restricted areas are listed on the DJI official website at http://www.dji.com/fly-safe/category-mc. Restricted areas are divided into category A and category B. Category A areas cover major international airport such as LAX and Heathrow, while category B areas includes smaller airports.

Category A Safety Zone

(1) The category A “safety zone” is comprised of a small “no-fly zone” and a range of “restricted-altitude zones”. Flight is prevented in the “no-fly zone” but can continue with height restrictions in the restricted-altitude zone. (2) 1.5 miles (2.4 km) around a designated safety zone is a no-fly zone, inside which takeoff is prevented.

(3) 1.5 miles (2.4 km) to 5 miles (8 km) around restricted areas are altitude restricted, with maximum altitude going from 35 feet (10.5 m) at 1.5 miles (2.4 km) to 400 feet (120 m) at 5 miles (8 km).

(4) A “warning zone” has been set around the safety zone. When you fly within 320 feet (100m) of the safety zone, a warning message will appear on the DJI Pilot App.

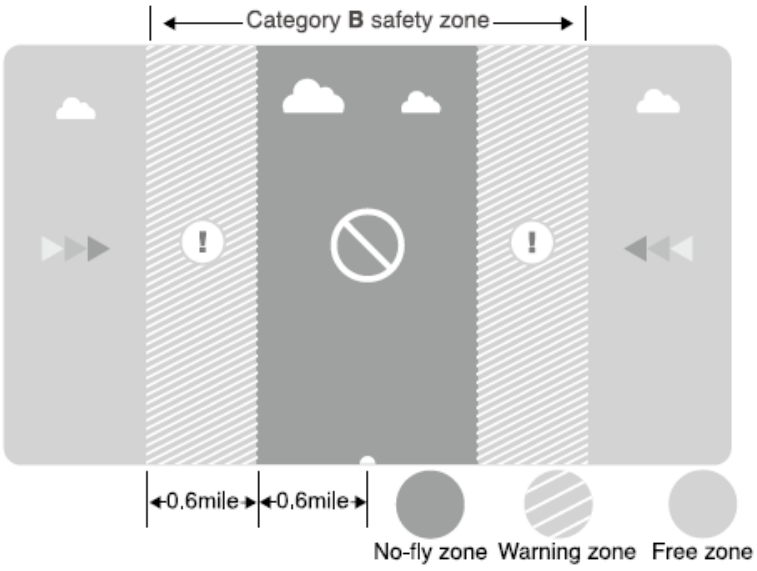


Category B Safety Zone

(1) Category B “safety zone” is comprised of a “no-fly zone” and a “warning zone”.

(2) 0.6 miles (1 km) around the safety zone is a designated “no-fly zone”.

(3) A “warning zone” has been set around the safety zone. When you fly within 0.6 miles (1Km) of this zone, a warning will appear on the DJI Pilot App.



GPS Signal Strong G ····· Blinking Green			
Zone	Restriction	DJI Pilot App Prompt	Aircraft Status Indicator
No-fly Zone	Motors will not start.	Warning: You are in a No-fly zone. Take off prohibited.	R ····· Red flashing
	If the aircraft enters the restricted area in A mode but P mode activates the aircraft will automatically descend to land then stop its motors after landing.	Warning: You are in a No-fly zone, automatic landing has begun. (If you are within 1.5 mile radius)	
Restricted-altitude flight zone	If the aircraft enters the restricted area in A mode but P mode activates, it will descend to a safe altitude and hover 15 feet below the safe altitude.	Warning: You are in a restricted zone. Descending to safe altitude. (If you are between the range of 1.5 mile and 5 mile radius) Warning: You are in a restricted zone. Max flight height restricted to between 10.5m and 120m. Fly Cautiously.	
Warning zone	No flight restriction applies, but there will be warning message.	Warning: You are approaching a restricted zone, Fly Cautiously.	
Free zone	No restrictions.	None.	None.

Reference:

Semi-automatic descent: All stick commands are available except the throttle stick command during the descent and landing process. Motors will stop automatically after landing.

Note:

- When flying in the safety zone, aircraft status indicator will blink red quickly and continue for 3 seconds, then switch to indicate current flying status and continue for 5 seconds at which point it will switch back to red blinking.
- For safety reasons, please do not fly close to airports, highways, railway stations, railway lines, city centers and other special areas. Try to ensure the aircraft is visible.

DJI Pilot App and Pix4D Flight Path Examples