

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CERTIFICATE OF WAIVER

Wing Aviation LLC

Responsible Person: Chris Jackman

Waiver Number: 107W-2019-01205A

**100 Mayfield Avenue
Mountain View, CA 94043**

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

OPERATIONS AUTHORIZED

Proving and validation simulated delivery flights in accordance with the Wing Aviation LLC draft Operations Specifications and 44807 exemption.

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

**14 CFR § 107.29—Daylight Operation,
14 CFR § 107.31—Visual line of sight aircraft operation,
14 CFR § 107.33(b) and (c)(2) — Visual observer,
14 CFR § 107.35—Operation of multiple small unmanned aircraft systems,
14 CFR § 107.39—Operation over people,
14 CFR § 107.51(c)—Operating limitations for sUA- Visibility, and
14 CFR § 107.51(d)—Operating limitations for sUA- Cloud Clearance**

STANDARD PROVISIONS

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

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

SPECIAL PROVISIONS

Special Provisions Nos. 1 to 33, inclusive, are set forth on the attached pages.

This Certificate of Waiver is effective from April 2, 2019, to October 31, 2020, or upon completion of the Wing 14 CFR Part 135 validation tests, and is subject to cancellation at any time upon notice by the Administrator or an authorized representative.

Office of the Executive Director

Flight Standards Service

SPECIAL PROVISIONS ISSUED TO
Wing Aviation LLC

General

This waiver is an amendment and supercedes waiver 107W-2019-01205. Waiver 107W-2019-01205 is no longer valid.

The FAA's Flight Standards Service has reviewed your application to ensure compliance with the requirements of 14 CFR § 107.200. The Administrator finds that the proposed sUAS operation can be conducted safely under the provisions of this Certificate of Waiver (Waiver) as listed below because you have established adequate mitigations for risks involved with operating your sUAS in the manner you described. Adherence to the provisions of this Waiver establishes the required level of safety within the national airspace system.

This Waiver may be canceled at any time by the Administrator, the person authorized to grant the Waiver, or the representative designated to monitor a specific operation. As a general rule, this Waiver may be canceled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with any provision listed below is a violation of the terms of this Waiver and may serve as justification for cancellation.

List of Regulations Waived by Section and Title. The following regulations are waived:

- 14 CFR § 107.29**, Daylight operation, is waived to allow sUAS operations during night.
- 14 CFR § 107.31**, Visual line of sight aircraft operation, is waived to allow operation of the small unmanned aircraft (sUA) beyond the direct visual line of sight of the remote pilot in command (PIC) and any visual observer (VO) who is participating in the operation.
- 14 CFR § 107.33(b) and (c) (2)**, is waived to the extent necessary to allow operation of the small unmanned aircraft (sUA) when each VO who is participating in the operation may not be able see the unmanned aircraft in the manner specified in §107.31.
- 14 CFR §107.35** Operation of multiple small unmanned aircraft is waived to the extent necessary to allow a person to act as a remote Pilot in Command (PIC) or visual observer (VO) in the operation of more than one unmanned aircraft at the same time.
- 14 CFR § 107.39**, Operations over human beings is waived to allow sUA operations over human beings who are not direct participants, necessary for the safe operation of the small unmanned aircraft.
- 14 CFR § 107.51(c)**, Operating limitations for small unmanned aircraft is waived to allow sUAS operations when the visibility, as observed from the location of the control station is less than 3 statute miles.
- 14 CFR § 107.51(d)**, Operating limitations for small unmanned aircraft is waived to the extent necessary to allow sUA operations closer than 500 feet below a cloud, and 2000 feet horizontally from a cloud.

No part of this waiver will function as an airspace authorization under 14 CFR § 107.41. The FAA's Air Traffic Organization responds directly to such requests.

Common Special Provisions. The Responsible Person is directly responsible for safety of operations conducted under this Waiver and will ensure the Remote Pilot in Command (remote PIC), manipulator of the controls, and Visual Observer(s) (VO(s)¹) comply with all provisions of this Waiver.

1. The Responsible Person listed on the Waiver is responsible to the FAA for the safe conduct of the operations. Prior to conducting operations that are the subject of this Waiver, the responsible person:
 - a. Must ensure the remote PIC, manipulators of the controls, and VO(s) are informed of the terms and provisions of this Waiver and strictly observe the terms and provisions herein;
 - b. Must ensure the remote PIC, manipulators of the controls, and VO(s) are informed and familiar with part 107 regulations; and
 - c. Evidence of the above (a and b) must be documented and must be presented for inspection upon request from the Administrator or an authorized representative;
2. This Waiver may not be combined with any other waiver(s), authorization(s), or exemption(s) without specific authorization from the FAA;
3. The FAA has the authority to cancel or delay any or all flight operations if the safety of persons or property on the ground or in the air are in jeopardy or there is a violation of the terms of this Waiver;
4. A copy of this Waiver, draft Operations Specifications, and 44807 exemption must be accessible and available to the Remote Pilot in Command (remote PIC) at the ground control station during sUAS operations that are the subject of this Waiver;
5. The Responsible Person listed on this Waiver must maintain a current list of pilots by name and remote pilot certificate number used in operations under this Waiver. This list must be presented for inspection upon request from the Administrator or an authorized representative;
6. The Responsible Person listed on this Waiver must maintain a current list of small unmanned aircraft (sUA) by registration number(s) used in the Waiver holder's operations. This list must be presented for inspection upon request from the Administrator or an authorized representative;
7. For the purposes of this Waiver, Direct Participants are the remote pilots in command (PICs), persons manipulating the controls, visual observers (VOs), and any persons whose involvement is necessary for safety of the sUAS operation. All other persons are considered non-participants, including the merchant-loader and customer retriever;

¹ Title 14 CFR § 107.3 defines the term "visual observer." Any VO participating in operations conducted under this Waiver must meet the requirements listed in § 107.33 throughout the duration of flight operations.

Waiver Specific Special Provisions. sUAS operations beyond the visual line of sight (BVLOS) of the remote PIC and VO(s), and over human beings may be conducted under this waiver when the operation complies with the following provisions:

OPERATIONAL PROVISIONS

8. Operations under this Waiver must use one or more VO(s);
9. The remote PIC must ensure sufficient VO(s) are used to identify any non-participating aircraft prior to their entry into the planned operational area. For the purpose of this Waiver, sufficient VO(s) is defined as the minimum number of VO(s) required to continuously observe at least a 2 statute mile radius of airspace surrounding each sUA in flight;
10. Prior to conducting operations that are the subject of this Waiver, the remote PIC and VO(s) must be trained to recognize and overcome visual illusions caused by darkness, and understand physiological conditions which may degrade night vision;
11. The Responsible Person must ensure all operations conducted under this Waiver follow the procedures outlined in the operations manual. If a discrepancy exists between the provisions in this Waiver and the procedures outlined in the operations manual, the provisions of this Waiver take precedence and must be followed;
12. Prior to conducting operations under this Waiver, the remote PIC and VO(s) must be proficient in visual line of sight (VLOS) operations and trained in accordance with the waiver applicants training program;
13. Prior to operations under this Waiver, all direct participants must attend a safety briefing that addresses at minimum, the following items:
 - a. Designated positions, physical locations, responsibilities, and Crew Resource Management,
 - b. Planned flight operating area,
 - c. Designated launch and recovery areas,
 - d. Verification of geo-fence boundaries,
 - e. Verification of flight profile(s), and course,
 - f. Procedures for avoidance of other aircraft, and
 - g. Procedures for operating under this Waiver;
14. Communication between the remote PIC and VO(s) must occur to facilitate, when necessary, the remote PIC taking action to maneuver the sUA with sufficient time to:
 - a. Give way to all other aircraft in accordance with § 107.37,
 - b. React to any unforeseen operational or mechanical failure without creating a hazard to other people, other aircraft, or property in the event of a loss of control of the sUA, and
 - c. Maintain compliance with this Waiver and the requirements of part 107;

15. Operations subject to this waiver must cease if, at any time:
 - a. Safety of human beings or property on the ground or in the air is in jeopardy,
 - b. Any failure to comply with the provisions of this Waiver exists,
 - c. Full-duplex communications cannot be maintained between the remote PIC and any VO participating in the operation,
 - d. Ability to immediately change the sUA flight course is unavailable to the remote PIC or the manipulator of the controls,
 - e. A non-participating aircraft enters the designated flight operating area,
 - f. GPS signal is lost, or
 - g. sUA GPS location information is degraded;
16. All planned launches and recoveries of the sUA must be within VLOS of the remote PIC;
17. Not less than 24 hours prior to conducting operations that are the subject of this Waiver, a Notice to Airmen (NOTAM) must be filed. The NOTAM must include location, altitude, and/or operating area, time and nature of the activity, and number of sUA flying in the operating area;
18. No sUA flight that occurs under this waiver may carry the property of another for compensation or hire;

TECHNICAL PROVISIONS

19. Operations conducted under this Waiver may only occur with the Hummingbird 7000 sUAS, as described in the waiver application;
20. Up to 5 sUA may be simultaneously operated by the remote PIC;
21. At night, the sUA must be equipped with lighted anti-collision lighting visible from a distance of no less than 3 statute miles. During day operations, with vision that is unaided by any device other than corrective lenses, the sUA must be visible from a distance of no less than 1 statute mile;
22. All sUAS operations conducted in accordance with this Waiver must adhere to all manufacturer guidelines, recommendations and limitations for the sUAS;
23. sUAS flight routes must be planned, and sUAS must be programmed for semi-autonomous flight;
24. The sUAS ground control station must audibly or visually alert the remote PIC of degraded system performance, sUAS malfunction, and loss of Command and Control link with the sUA;
25. At all times during sUAS operations, the sUAS ground control station must display in real time, at least the following information:
 - a. sUA altitude, sUA position,
 - b. sUA direction of flight, and
 - c. sUAS flight mode;
26. ADS-B out (1090/978 MHz) may not be transmitted from the sUAS when operating pursuant to this Waiver;

27. All emitters used in sUAS must be in compliance with all applicable FCC regulations and all provisions of the FCC authorization granted for the emitter. A FCC experimental authorization may not be used for sUAS operations under this Waiver;
28. Prior to conducting operations under this Waiver, the remote PIC must determine all control links the used in the sUAS will maintain command and control link at the maximum planned distance for the proposed operation. At all times during operations that are the subject of this Waiver, the remote PIC must maintain the ability to direct the sUA to ensure compliance with the applicable provisions of this chapter;
29. If the remote PIC loses command or control link or the command and control link latency has the potential to degrade the ability of the RPIC to immediately maneuver the sUA, the sUA must follow a predetermined route to either reestablish link or immediately recover/land at a predesignated location;
30. If communication between the VO and the remote PIC will occur by electronic device:
 - a. The device must be continuous full-duplex,
 - b. The remote PIC must be able to use the device hands-free, and
 - c. There must be a reliable back-up communication method;

ENVIRONMENTAL PROVISIONS

31. Operations may occur under this waiver with the visibility as measured from the ground control station and each VO's location, of less than 3sm, but not less than 2sm. At all times, for each sUA inflight, sufficient VO(s) must be used to observe an airspace radius of not less than 2 sm surrounding each sUA inflight;
32. During package loading, the sUA may sustain operations over the merchant loader. During package delivery, the sUA may sustain operations over the customer retriever. The sUA must not sustain operations over any other person who is not directly participating in the operation. Overflight of open air assemblies of persons is prohibited; and
33. Takeoff, landing, package pickup, and simulated package delivery are limited to the locations identified in the Wing 14 CFR Part 135 validation plan.