

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
CERTIFICATE OF WAIVER

ISSUED TO

Kansas Department of Transportation Division of Aviation
Responsible Person: Bob Brock
Waiver Number: 107W-2019-04024

ADDRESS –

700 South West Harrison Street
9th Floor
Topeka, KS 66603

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

Small-unmanned aircraft system (sUAS) operations at night, or, sUAS operations beyond the visual line of sight by the remote pilot in command (PIC) and Visual Observer (VO), in lieu of visual line of sight (VLOS).

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

14 CFR § 107.29 — Daylight operation
14 CFR § 107.31 — Visual line of sight aircraft operation, and
14 CFR § 107.33(b) and (c)(2) — Visual observer

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 34, inclusive, are set forth on the attached pages.

This Certificate of Waiver is effective from August 7, 2018, to September 30, 2022, 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
Kansas Department of Transportation Division of Aviation

General.

This waiver is an amendment and supersedes waiver 107W-2018-17060. Waiver 107W-2018-17060 is no longer valid.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 a 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 PIC or VO.

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 may not be able see the unmanned aircraft in the manner specified in §107.31.

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 (PIC), manipulator of the controls, and Visual Observer (VO)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 are informed on the terms and provisions of this Waiver and the strict observance of the terms and provisions herein;
 - b. Must ensure the remote PIC, manipulators of the controls, and VO are informed and familiar with part 107 regulations not waived; and
 - c. The above (a and b) must be documented and must be presented for inspection upon request from the Administrator or an authorized representative;

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.

2. This Waiver must 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 must be available 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 the Waiver holder's operations. 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;

Waiver Specific Special Provisions. sUAS operations may be conducted under this waiver, at night or Beyond Visual Line of Sight (BVLOS) of the remote PIC and VO(s) provided:

OPERATIONAL PROVISIONS

7. Operations under this Waiver must adhere to the requirements in listed in provision 34 for the use of VO(s) to observe the airspace and see other aircraft or the use of Detect and Avoid technology;
8. If using VO(s) in accordance with provision 34, the remote PIC must ensure sufficient VO(s) are used to identify any non-participating aircraft and any non-participating persons prior to their entry into the planned operational area. For the purpose of this Waiver, sufficient VO(s) is defines as the minimum number of VO(s) required to continuously observe, using human vision unaided by any device other than corrective lenses, at least a 2 statute mile radius of airspace surrounding the sUA in flight;
9. Prior to operations conducted under this Waiver, the Responsible Person must develop, and the Responsible Person must ensure, the developed operations manual is made available to the Administrator. The Responsible Person must ensure all operations conducted under this Waiver follow the procedures as 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;

10. The operations manual developed by the Responsible Person contains at least the following items:
 - a. Operator name, address, and telephone number,
 - b. Method of distribution and revision,
 - c. Certificate of Waiver. The operations manual must include a copy of the current Waiver(s),
 - d. Aircraft description and limitations list by aircraft type and model,
 - e. Method to ensure safety of non-participating persons and aircraft,
 - f. Safety briefing of Direct Participants,
 - g. Direct Participants Minimum Requirements. In accordance with this Waiver, the Responsible Person must specify the minimum requirements for all Direct Participants in the operating manual, and the method used by the Direct Participants to meet those minimum requirements,
 - h. Method of communications,
 - i. Normal operating procedures,
 - j. Abnormal operating procedures,
 - k. Emergency procedures,
 - l. Crew Resource Management,
 - m. Risk management, and
 - n. Accident Notification. The operations manual must contain procedures for notification and reporting of accidents in accordance with this Waiver;
11. The Responsible Person must ensure that a copy of the current operations manual is available to the remote PIC and all other participants during sUAS operations that are the subject of this Waiver;
12. The Responsible Person may update or revise its operations manual. The Responsible Person must track such revisions and present updated and revised documents to the Administrator or an authorized representative upon request. The Responsible Person must also present updated and revised documents if it applies for extension or amendment. If the Responsible Person determines that the intended operation differs from the purpose for which this waiver is granted, or if the intended operation would be contrary to or obviate a condition or limitation of this waiver, then the Responsible Person must apply for an amendment to this Waiver;
13. The Responsible Person listed on this Waiver must ensure each remote PIC is trained in a manner consistent with how the sUAS will be operated under this Waiver. All training and demonstration for any remote PIC and VO must be documented and made available upon request by the Administrator or an authorized representative. Training operations may only be conducted under the standard requirements of part 107 (without waiver). The training must include:
 - a. sUA limitations,
 - b. sUA programming,
 - c. sUA operational procedures,
 - d. Abnormal and contingency procedures,
 - e. Evasive and emergency procedures,
 - f. Crew Resource Management,
 - g. sUA flight training,
 - h. recognizing and overcoming visual illusions caused by darkness,
 - i. physiological conditions which may degrade night vision, and
 - j. a demonstration of sUA ground and flight skills;

14. Prior to operations under this Waiver, all persons who will act as remote PIC, participate in the operation as a part 107 certificated airman, and VO's must participate in a safety briefing that addresses at minimum, the following items:
 - a. Designated positions and responsibilities/Crew Resource Management,
 - b. Flight operating area,
 - c. Designated launch and recovery area,
 - d. Verification of geo-fence boundaries,
 - e. Return to Home (RTH) flight profile and course,
 - f. Normal procedures,
 - g. Abnormal procedures, and
 - h. Emergency procedures;

15. Communication between the remote PIC, and VO must allow for the remote PIC 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 for any reason, and
 - c. Maintain compliance with this Waiver and unwaived provisions of part 107;

16. Operations conducted 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. There is a failure to comply with the provisions of this Waiver,
 - c. Full-duplex communications cannot be maintained between the remote PIC and the VO,
 - d. sUA control link is lost,
 - e. A non-participating vehicle, aircraft or person enters the designated flight operating area,
 - f. GPS signal is lost, or
 - g. sUA GPS location information is degraded;

17. sUA flight under this waiver may not carry the property of another for compensation or hire;

18. 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;

19. The Responsible Person must establish and maintain a Safety Management System (SMS) appropriate for the size, scope, and complexity of the waived operation. Guidance on establishing and maintaining an SMS is available in FAA Advisory Circular 120-92B (or current revision). This program must be made available upon request by the Administrator;

20. Flight operations recordkeeping requirements. Records shall be retained for a period of 90 days after the expiration date of the Waiver. The Responsible Person shall keep at its principal business office or at other places approved by the Administrator, and provide the Administrator upon request, the following:
- a. For each sUA flight conducted under the terms of this waiver—
 - i. Registration number of the sUA,
 - ii. Make and model of the sUA,
 - iii. Name and certificate number of the remote PIC,
 - iv. Name and certificate number of the onsite part 107 certificated airman (VO),
 - v. Location of the remote PIC during the sUA flight,
 - vi. Location of the sUA, and
 - vii. Duration of the sUA operation;
 - b. sUA equipment malfunctions. Reportable sUA equipment malfunctions include, but are not limited to, the following:
 - viii. Onboard flight control system,
 - ix. Any portion of the navigation system to include GPS functionality,
 - x. Power plant malfunction or failure,
 - xi. Battery malfunction or failure,
 - xii. Electrical power system malfunction or failure,
 - xiii. Lost link within the sUAS, and
 - xiv. Control station malfunction or failure;

TECHNICAL PROVISIONS

21. All sUA operations conducted in accordance with this Waiver must comply with the manufacturer User Manual, including recommendations and limitations;
22. If not using VO(s) in accordance with provision 34, the detect system described in the application must use an automated avoid response that is not reliant on RPIC input or the C2 link. When the sUA automatically performs an avoidance maneuver, prior to resuming on course, the RPIC must ensure the sUA is well clear of and does not pose a collision hazard to other aircraft. Use of the Detect and Avoid system described in the application, when not using VO(s) to observe the airspace, is limited to Daylight Operations only.
23. The Responsible Person must maintain each sUAS and its components in accordance with manufacturer's instructions and recommendations. sUA maintenance includes scheduled and unscheduled overhaul, repair, inspection, modification, replacement, and system software upgrades of the sUAS and its components necessary for flight. A log of all maintenance performed must be kept for each aircraft operated under this waiver. This log must be available to the remote PIC for review prior to conducting operations that are the subject of this waiver. Each sUA maintenance log must be presented to the Administrator when requested;
24. Any sUAS that has undergone maintenance must undergo a functional test flight prior to conducting operations under this Waiver. A log entry must be made for each functional test flight. The log entry must contain at minimum the:
- a. Calendar date,
 - b. sUA registration number,
 - c. Remote PIC who performed the functional test flight,

- d. Duration of the flight, and
 - e. The result of the functional flight test;
25. During the daytime, the sUA must be equipped with high visibility markings or lighting visible from a distance of no less than 1 statute mile(s). When operated at night, the sUA must be equipped with anti-collision lighting visible from a distance of no less than 3 statute miles. At night, the intensity of the anti-collision lighting may be reduced if, because of operating conditions, it would be in the interest of safety to do so;
26. All sUA operated under this Waiver must be capable of automatic operations;
27. The sUAS ground control station must display in real time, sUA altitude, sUA position, sUA direction of flight information, and sUA flight mode. This information must be available at all times to the remote PIC;
28. 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 (C2) link with the sUA;
29. Prior to operations that are the subject of this Waiver, the remote PIC must determine the Command and Control link with the sUA has performance capabilities that exceed the planned ranges for the proposed operation. At all times during normal operations that are the subject of this Waiver, the remote PIC must maintain Command and Control link with the sUA;
30. If the remote PIC loses command or control link with the sUA, the sUA must immediately follow a predetermined route and land at a pre-designated location;
31. If communication between the VO and the remote PIC is by use of an electronic device:
- a. The device must be continuous full-duplex,
 - b. The remote PIC's device must be hands-free, and
 - c. There must be a reliable back-up communication method;
32. Prior to transmitting ADS-B out (1090/978 MHz) from the sUAS, written authorization must be obtained from the Air Traffic Organization;
33. 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;

ENVIRONMENTAL PROVISIONS

34. Operations conducted under this Waiver are limited to operations within the polygons identified by the following chart:

Operating Area	Coordinates	Authorized Altitude	Additional Requirements
Gypsum Range	38°40'31.63"N 97°32'32.91"W	400 AGL	Operations in this area must utilize sufficient VO(s) to observe the airspace as defined in provision 8.
	38°43'46.14"N 97°32'36.84"W		
	38°44'27.38"N 97°31'54.12"W		
	38°45'12.28"N 97°31'24.54"W		
	38°45'12.44"N 97°22'23.50"W		
	38°40'27.31"N 97°22'20.37"W		
Spring Creek Ranch	37°47'14.25"N 96°31'31.85"W	400 AGL	Operations in this area must utilize sufficient VO(s) to observe the airspace as defined in provision 8.
	37°47'17.86"N 96°28'40.68"W		
	37°48'56.45"N 96°28'47.20"W		
	37°48'59.32"N 96°26'58.28"W		
	37°48'3.19"N 96°26'55.50"W		
	37°48'5.49"N 96°24'27.33"W		
	37°47'41.66"N 96°24'2.50"W		
	37°46'2.16"N 96°24'7.43"W		
	37°44'57.27"N 96°26'16.20"W		
	37°44'52.76"N 96°27'40.32"W		
	37°43'33.73"N 96°27'36.89"W		
	37°43'34.09"N 96°30'5.99"W		
	37°44'9.64"N 96°30'37.54"W		
	37°44'9.65"N 96°31'29.64"W		
South East of Salina Substation to 9-miles East.	38° 43' 31" N 97° 29' 0" W	400 AGL	May use sufficient VO(s) or the Detect system and automated Avoidance response as described in the waiver application.
	38° 43' 38" N 97° 32' 21" W		
	38° 43' 31" N 97° 22' 18" W		