

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION	
CERTIFICATE OF WAIVER OR AUTHORIZATION	
ISSUED TO Public Agency – University of Colorado Boulder	Part 91
ADDRESS University of Colorado Boulder 3775 Discovery Drive Boulder, CO 80309	
This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.	
OPERATIONS AUTHORIZED Operation of the Tempest, Mistral, and Drak Unmanned Aircraft System (UAS) in Class E and G airspace at or below 2500 AGL in the vicinity southwest Kansas under the jurisdiction of Vance AFB (END) Radar Approach Control (RAPCON) and Kansas City Air Route Traffic Control Center (ZKC ARTCC). See Special Provisions.	
LIST OF WAIVED REGULATIONS BY SECTION AND TITLE N/A	
STANDARD PROVISIONS	
<ol style="list-style-type: none">1. A copy of the application made for this certificate shall be attached and become a part hereof.2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein4. 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 Letters A thru I, inclusive, are set forth on the reverse side hereof.	
The certificate is effective from October 1, 2020 to September 30, 2022, inclusive, and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.	
BY DIRECTION OF THE ADMINISTRATOR	
<u>FAA Central Service Area</u> (Region)	<u>Vonnie L. Giles</u> (Signature)
	<u>Manager, Tactical Operations Team (AJV-C23)</u> (Title)

Purpose: To prescribe UAS operating requirements in the National Airspace System (NAS) for the purpose of Public Aircraft Operations. The holder of this COA will be referred herein as the “Proponent”.

Public Aircraft

1. A public aircraft operation is determined by statutes, 49 USC §40102(a) (41) and §40125.
2. All public aircraft flights conducted under a COA must comply with the terms of the statute.
3. All flights must be conducted per the declarations submitted in the application, and as specified in the following Special Provisions.
4. This COA provides an alternate means of complying with 14 CFR §91.113(b) for unmanned aircraft operations.
5. All operations will be conducted in compliance with Title 14 CFR §91 and the conditions of the authorization issued herein. If the operator cannot adhere to any of these requirements, a separate FAA Form 7711-2 waiver application may be required.

SPECIAL PROVISIONS

A. General.

1. All personnel connected with the UAS operation must read and comply with the contents of this authorization and its provisions.
2. A copy of the COA including the special limitations must be immediately available to all operational personnel at each operating location whenever UAS operations are conducted.
3. This authorization may be canceled at any time by the Administrator, the person authorized to grant the authorization, or the representative designated to monitor a specific operation. As a general rule, this authorization may be canceled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with the authorization is cause for cancellation. The proponent will receive a written notice of cancellation.
4. During the time this COA is approved and active, a site safety evaluation/visit may be accomplished to ensure COA compliance, assess any adverse impact on ATC or airspace, and ensure this COA is not burdensome or ineffective. Deviations, accidents/incidents/mishaps, complaints, etc., will prompt a COA review or site visit to address the issue. Refusal to allow a site safety evaluation/visit may result in cancellation of the COA.

Note: This section does not pertain to agencies that have other existing agreements in place with the FAA.

5. Radiofrequency spectrum authorization is independent of the COA process and requires the proponent to obtain Federal Communications Commission (FCC) equipment certification (47 CFR Part 2, Subpart J and 47 CFR Part 87, Subpart D) and frequency licenses (47 CFR Part 87) in the Aeronautical Radio navigation, Aeronautical Mobile (Route), or Aeronautical Mobile Services, as appropriate, for the control link, ATC radios, transponders, detect and avoid systems, and navigation systems used to support this COA. For systems operating exclusively below 400 feet, and within visual line of sight, the control link equipment may be licensed under 47 CFR Part 15 (Radio Frequency Devices). Equipment licensed under 47 CFR Part 5 (Experimental) does not provide the protection necessary for NAS operations.

B. Operations.

1. The UA must be operated within visual line of sight (VLOS) of the Pilot in Command (PIC) and the person manipulating the flight controls at all times unless otherwise specified in a Special Provision. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses. Although the remote PIC and person manipulating the controls must maintain the capability to see the UA, using one or more Visual Observers (VO) allows the remote PIC and person manipulating the controls to conduct other mission-critical duties (such as checking displays) while still ensuring situational awareness of the UA.
2. Must yield right of way to other aircraft, manned or unmanned.
3. First-person view camera cannot satisfy “see-and-avoid” requirement but can be used as long as the visual requirement is satisfied in other ways.
4. Minimum visibility of 3 statute miles from control station.

5. No person may act as a remote pilot in command or VO for more than one unmanned aircraft at one time unless otherwise authorized as a separate provision.
6. No operations from a moving vehicle or watercraft unless the operation is over a sparsely populated area and the PIC and VO are co-located.
7. Lost link must remain within visual line of sight of the PIC and VO.
8. The remote pilot in command may deviate from the requirements of this rule in response to an in-flight emergency.
9. Requests to operate in an area outside the approved operating area of this authorization should be limited to emergency/life threatening operations. Coordinate these flights through the Special Government Interest (SGI) process by calling the SOSC at (202) 267-8276, or email: 9-ATOR-HQ-SOSC@faa.gov.

C. Notice to Airmen (NOTAM).

1. A Distant (D) NOTAM must be issued prior to conducting UAS operations not more than 72 hours in advance, but not less than 24 hours for UAS operations prior to the operation for routine operations. This requirement may be accomplished:
 - a. Through the operator's local base operations or (D) NOTAM issuing authority, or
 - b. By contacting the NOTAM Flight Service Station at 1-877-4-US-NTMS (1-877-487-6867). The issuing agency will require:
 - (1) Name and contact information of the pilot filing the (D) NOTAM request
 - (2) Location, altitude and operating area
 - (3) Time and nature of the activity.
2. The area of operation defined in the (D) NOTAM must only be for the actual area to be flown for each day defined by a point and the minimum radius required to conduct the operation.
3. Operator must cancel (D) NOTAMs when UAS operations are completed or will not be conducted.

D. Reporting Requirements.

1. Documentation of all operations associated with UAS activities is required regardless of the airspace in which the UAS operates.
2. The Proponent must submit the number of flights on a monthly basis through the COA Application Processing System (CAPS).

E. Night small UAS Operations.

Small UAS operations may be conducted at night, as defined in 14 CFR § 1.1, provided:

1. All operations under the approved COA must use one or more VOs;
2. Prior to conducting operations that are the subject of the COA, the PIC and VO must be trained to recognize and overcome visual illusions caused by darkness, and understand physiological conditions which may degrade night vision. This training must be documented and must be presented for inspection upon request from the Administrator or an authorized representative;

3. The sUA must be equipped with lighted anti-collision lighting visible from a distance of no less than 3 statute miles. 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. Additionally, in order to comply with § 91.209, the aircraft must have position lighting that enables determination of location altitude, attitude, and direction of flight.

F. Minimum Safe Altitude Operations.

A waiver from the requirements of 14 CFR 91.119(b) and (c) is approved as follows:

1. The ground speed of the small UAS must not exceed 100 mph/87 knots.
2. Except for those operations where it is necessary to safeguard human life, no person may operate a small unmanned aircraft over a human being unless that human being is:
 - a. Directly participating in the operation of the small unmanned aircraft; or
 - b. Located under a covered structure or inside a stationary vehicle that can provide reasonable protection from a falling small unmanned aircraft

Note: People “directly participating in the operation of the small unmanned aircraft” may include qualified non-crewmembers, as defined in § 49 USC 40125.

3. For those operations where it is necessary to operate over a human being in order to safeguard human life, the remote pilot in command must not operate any lower or in proximity to human beings necessary to accomplish the operation.

G. Special Use Airspace.

1. Coordination and de-confliction between Military Training Routes (MTR) and Special Use Airspace (SUA) is the operator’s responsibility. When identifying an operational area the operator must evaluate whether an MTR or SUA will be affected. In the event the UAS operational area overlaps an MTR or SUA, the operator will contact the scheduling agency as soon as practicable in advance to coordinate and de-conflict. Approval from the scheduling agency is required for regulatory SUA, but not for MTR’s and non-regulatory SUA. If no response to coordination efforts, the operator must exercise extreme caution and remain vigilant of all MTRs and/ or non-regulatory SUAs.
2. Scheduling agencies for MTRs are listed in the Area Planning AP/1B Military Planning Routes North and South America. If unable to gain access to AP/1B contact the FAA at email address mail to: 9-AJV-115-UASOrganization@faa.gov with the IR/VR routes affected and the FAA will provide the scheduling agency information. Scheduling agencies for SUAs are listed in the FAA JO 7400.10.

H. Air Traffic Control Requirements.

1. Coordination Requirements.
 - a. Contact Phone Numbers:
 - (1) Kansas City ARTCC (913) 254-8513
 - (2) Vance RAPCON (580) 213-7135
 - b. PIC shall issue a NOTAM at least 24 hours prior to commencing operations. The NOTAM shall include the operating altitude and area, which shall be defined by a radius of a radial/DME fix from the ENID (END) VOR. The NOTAM shall also include an onsite phone number. This COA does not grant the operator permission to state the

entire area of this COA as its operational area. If operations are cancelled due to weather. Scheduling, etc., the NOTAM shall be cancelled promptly.

- c. Proponent must coordinate with Vance RAPCON 15 minutes prior to commencing UAS operations and immediately upon completion. Proponent must provide:

- (1) UAS Operational details
- (2) NOTAM information
- (3) PIC contact number in event ATC requires immediate termination of UAS operation.

- d. When Vance RAPCON is closed, proponent shall notify Kansas City ARTCC

2. Communication Requirements

- a. ATC Special Provision H will be used in lieu of maintaining direct two-way communications with ATC.
- b. For UAS operations in Class G Airspace the PIC must monitor and communicate as necessary on the appropriate Common Traffic Advisory Frequency (CTAF) frequency.

3. Flight Planning Requirements.

- a. The proponent is responsible for reviewing the most current Chart Supplement at https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/dafd/search/ for the intended airport of operation to determine operating hours and class of airspace.
- b. The operator is responsible for ensuring that proposed UAS operating area does not enter a UAS flight restricted areas as described under CFR 14 Part 99.7, Temporary Flight Restriction (TFR), Special Security Instruction (SSI). Location and contact information for the TFR SSI is depicted on the FAA website: <http://uas-faa.opendata.arcgis.com/>. Proponent must request permission and receive authorization via the contacts listed on the website prior to entering a TFR SSI.
- c. It is the operator's responsibility for obtaining authorization from the appropriate authority for any operations that that may result in launching and/or landing from lands or waters administered by a Federal, State or Public agency (e.g., National Parks, State Parks, Wilderness Area, and Wildlife Refuge, etc.).
- d. When necessary, transit of airways and routes must be conducted as expeditiously as possible. The unmanned aircraft must not loiter on Victor airways, jet routes, Q and T routes, IR routes, or VR routes.

4. Procedural Requirements.

- a. No Air traffic Control services are provided.
- b. The proponent must be familiar with and comply with 18 U.S. Code § 795 – “Photographing and sketching defense installations”.
- c. The UA must remain clear and yield the right of way to all other manned operations and activities at all times (including, but not limited to, ultralight vehicles, parachute activities, parasailing activities, hang gliders, etc.).
- d. UAS operations must not impede, delay, or divert manned operations.
- e. The PIC must not conduct concurrent or simultaneous UAS operations in the presence of manned aircraft.

- f. Operations will be terminated immediately if directed by ATC.
- g. The ATC Special Provisions in this COA in conjunction with operations area location, and altitude of operation is an acceptable mitigation of 14 CFR §91.215 requirement concerning the absence of a Mode C transponder.

I. Lost Link Emergency/Contingency Procedures.

1. Lost Link Procedures:

In the event of a lost link, the UAS pilot will immediately notify Vance RAPCON, at (580) 213-7135 or ZKC at (913) 254 8513 when Vance RAPCON is closed, state pilot intentions, and comply with the following provisions:

- a. In the event that the data link is lost for at least three (3) seconds: The aircraft will execute the flight controller fail safe mode and climb to an altitude not exceeding the upper limits of the approved COA to attempt to re-establish Link.
- b. If link cannot be established for a period of 30 seconds:
 - (1) The PIC must notify any ground assets that could be affected.
 - (2) The VO must be instructed to note bearing and approximate distance to commence recovery operations.
 - (3) The aircraft will fly back to the home point and land.
- c. The UA will remain within the NOTAM'ed Operations Area.
- d. The UA will not transit or orbit over populated areas.
- e. The UA will not interfere with the traffic pattern nor arrival/departure procedure of airports within the NOTAM'ed operations area.
- f. If lost link occurs within a restricted or warning area, or the lost link procedure above takes the UA into the restricted or warning area, the aircraft will not exit the restricted or warning areas until the link is re-established or coordination with ATC has occurred.
- g. The PIC will notify the appropriate ATC facility within 15 minutes of the end of the flight.

2. Loss of Sight:

If a VO loses sight of the UA, the PIC must be notified immediately. If the UA is visually reacquired, the mission may continue. If not, the PIC must immediately terminate the operation.

3. Loss of Communication between the PIC and VO:

The UAS will return to Lost Link Home point and land. If communications are reestablished, the mission may resume. If communication cannot be promptly re-established, the PIC must land as soon as practical.

4. Fly Away/Loss of Control: In the event of a fly-away, the PIC will immediately notify the ATC facility with jurisdiction over the operations area. The PIC will provide the following information:

- a. Altitude.
- b. Last known location.

- c. Direction of flight/heading.
- d. Fuel on board/Battery Time.
- e. PIC intentions.
- f. Termination of flight or emergency condition.

AUTHORIZATION

This Certificate of Waiver or Authorization does not, in itself, waive any Title 14 Code of Federal Regulations not specifically stated, nor any state law or local ordinance. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the responsibility of the proponent to resolve the matter. This COA does not authorize flight within Temporary Flight Restrictions, Special Flight Rule Areas, regulatory Special Use Airspace or the Washington DC Federal Restricted Zone (FRZ) without pre-approval. The proponent is hereby authorized to operate the small Unmanned Aircraft System in the NAS within the areas defined in the Operations Authorized section of the cover page.

Operating Location:

Class E and G airspace as defined by the coordinates and depiction below:

36° 00' 00"N	98° 51' 00"W
36° 00' 00"N	97° 09' 00"W
36° 48' 00"N	97° 09' 00"W
36° 48' 00"N	98° 51' 00"W
Back to Start	

Operating Altitudes:

Class G and E airspace at or below 2500' AGL.

