

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION	
CERTIFICATE OF WAIVER OR AUTHORIZATION	
<small>ISSUED TO</small> Public Agency – University of Colorado Boulder	Part 91
<small>ADDRESS</small> 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.	
<small>OPERATIONS AUTHORIZED</small> Operation of Drak UAS, Mistral UAS and Tempest UAS in Class E and G airspace from the surface to 2,500 feet Above Ground Level (AGL) in the vicinity of Northwestern Texas and Western Oklahoma under the jurisdiction of Albuquerque Air Route Traffic Control Center (ZAB ARTCC), Kansas City Air Route Traffic Control Center (ZKC ARTCC), Fort Worth Air Route Traffic Control Center (ZFW ARTCC), Vance Radar Approach Control (END RAPCON), Altus Radar Approach Control (LTS RAPCON), Cannon Radar Approach Control (CVS RAPCON), Fort Sill Army Radar Approach Control (FSI ARAC), Amarillo Terminal Radar Approach Control (AMA TRACON), Lubbock Terminal Radar Approach Control (LBB TRACON) and Sheppard Radar Approach Control (SPS RAPCON). See Attachment 1.	
<small>LIST OF WAIVED REGULATIONS BY SECTION AND TITLE</small> 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 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 A thru I, inclusive, are set forth on the reverse side hereof.	
This certificate is effective from July 1, 2021 to June 30, 2023 , 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 Radionavigation, 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. Unless otherwise authorized as a special provision, a maximum of one unmanned aircraft will be controlled:
 - a. From a single control station, and
 - b. By one pilot at a time.
2. When necessary, transit of airways and routes must be conducted as expeditiously as possible. The unmanned aircraft should not plan to loiter on Victor airways, jet routes, Q and T routes, IR routes, or VR routes.
3. For flights operating on an IFR clearance, the PIC must ensure positional information in reference to established National Airspace System (NAS) fixes, NAVAIDs, and/or waypoints are provided to ATC. The use of latitude/longitude positions is not authorized, except oceanic flight operations.
4. Unless installed as part of a Detect and Avoid (DAA) system, the use of a Traffic Collision Avoidance System (TCAS) in Traffic Advisory (TA) or Traffic Advisory/Resolution Advisory (TA/RA) modes while operating an unmanned aircraft is prohibited.

C. Safety of Flight.

1. The operator or delegated representative is responsible for halting or canceling activity in the COA area if, at any time, the safety of persons or property on the ground or in the air is in jeopardy, or if there is a failure to comply with the terms or conditions of this authorization.
 - a. Any crew member responsible for performing see-and-avoid requirements for the UA must have and maintain instantaneous communication with the PIC.
 - b. Visual observers must be used at all times except in Class A airspace, active restricted areas, and warning areas designated for aviation activities or as authorized in the Special Provisions. Observers may either be ground-based or airborne in a chase plane.
 - (1) Visual Observers:
 - (a) Must be able to communicate clearly to the pilot any instructions required to remain clear of conflicting traffic, using standard phraseology as listed in the Aeronautical Information Manual when practical.
 - (b) The PIC is responsible to ensure visual observers are able to see the aircraft and the surrounding airspace throughout the entire flight, and
 - (c) The PIC is responsible to ensure visual observers are able to provide the PIC with the UA's flight path, and proximity to all aviation activities and other hazards (e.g., terrain, weather, structures) sufficiently to exercise effective control of the UA to:
 - Comply with 14 CFR § 91.111, §91.113 and § 91.115, and
 - Prevent the UA from creating a collision hazard, and
 - Comply with all conditions of this COA.

D. 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 unless operations are contained within Class A airspace, active restricted or warning areas that are designated on the appropriate aeronautical chart or airport directory. 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 NOTAM request
 - (2) Location, altitude, or 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.
4. For first responders only. Due to the immediacy of some emergency management operations, the (D) NOTAM notification requirement may be issued as soon as practical before flight and if the issuance of a (D) NOTAM may endanger the safety of persons on the ground, it may be excluded. If the (D) NOTAM is not issued, the proponent must be prepared to provide justification to the FAA upon request.

E. 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).

F. 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.

G. Operation Limitations.

UAS activities must not be conducted within a 15 nautical mile radius of Altus Air Force Base, and 5 nautical mile radius from Lubbock Preston Smith International Airport, Sheppard Air Force Base, and Amarillo Airport. SOONER Drop Zone and R-5601 (Attachment 3). Detail of R-5601 (Attachment 4).

H. Air Traffic Control Requirements.

1. Coordination Requirements:

- a. For operations in Albuquerque Air Route Traffic Control Center (ZAB) the PIC will notify ZAB Operations Manager at least one hour prior to operations at 505-856-4500. PIC will provide the area of operation, NOTAM number, a point of contact and a phone number the PIC can be reached during UAS operations.
- b. For operations in Kansas City Air Route Traffic control Center (ZKC) the PIC will notify ZKC Operations Manager at least one hour prior to operations at (913) 254-8500. PIC will provide the area of operation, NOTAM number, a point of contact and a phone number the PIC can be reached during UAS operations.
- c. For operations in Fort Worth Air Route Traffic Control Center (ZFW) the PIC will notify ZFW Ops Manager position at least four hours prior to operations at 817-858-7503. PIC will provide the area of operation, NOTAM number, a point of contact and a phone number the PIC can be reached during UAS operations.
- d. When operating within 5 nm of the following military training routes the proponent shall call the respective unit and provide the NOTAM number, a point of contact and phone number at least two hours prior to operations.

IR103, IR105, VR104, VR1128, VR1137	Fort Worth Joint Reserve Base	817-782-6903
IR128	Dyes AFB	325-696-3666
IR154, IR155, IR193, VR106, VR184, VR190, VR191, VR198, VR199	Altus AFB	580-481- 7422/1375/7490
IR172, IR 173	Vance AFB	580-213-6276
VR159, VR1139, VR1140, VR1141 VR1142, VR1143, VR1144, VR1145	Sheppard AFB	940-676-0809/8090
VR189	Arkansas ANG	479-573-5502
R5601	Fort Sill ARAC	580-442-1994/2004

- e. When operating in Abilene TRACON, Cannon RAPCON, Altus RAPCON, Fort Sill ARAC, Lubbock TRACON, or Sheppard RAPCON Airspace, the proponent shall call the respective unit at the number below one hour prior to operations and upon completion of operations. Proponent will provide the NOTAM number, a point of contact, and phone number for planned activities.

NOTE: See Attachment 2 for each control facilities airspace.

Amarillo TRACON	806-365-4002
Cannon RAPCON	575-784-2465
Altus RAPCON	580-481-7020
Fort Sill ARAC	580-442-1994/2004
Lubbock TRACON	806-766-6505
Sheppard RAPCON	940-676-6804/2372

- f. When operating within Vance RAPCON (END) airspace, the proponent shall call the RAPCON at 580-213-6765, one hour prior to operations and upon completion of operations. Proponent will advise of operational intentions and provide an on-site phone number. Note: For Vance RAPCON's airspace, see Attachment 2. When operating near IR-145, IR-171, IR-175, IR-181, IR-182, IR-183, IR-185, SR-274 or SR-275, the proponent shall call the Vance Airspace Manager at 580- 213-6276 or email at vanceairspace@us.af.mil , and provide the NOTAM number, a point of contact and phone number, at least 24 hours prior to operations.
- g. If UAS activities are conducted within a 5 nm radius of Clinton Sherman airport (CSM) the proponent shall contact CSM Tower at 580-562-4026.
- h. ATC may limit, prohibit or terminate UAS operations when the safety of manned aircraft operations is a concern.
- i. If a review of NOTAMs during preflight actions (see Special Provisions Section C.) reveals another proponent operating in all, or part of, the intended operating area, the proponent must de-conflict the intended operating area from the active operating area by contacting that proponent. Contact information may be obtained from the affected air traffic control facility, if not otherwise known.

2. Communication Requirements.

- a. Special Provisions, H. Air Traffic Control Requirements and I. Lost Link Emergency/Contingency Procedures will be used in lieu of maintaining direct two-way Communications.
- b. When operating within 5 NM of Alva Regional Airport, Alva, Oklahoma (KAVK), Gage Airport, Gage, Oklahoma (KGAG), Guymon Airport, Guymon, Oklahoma (KGUY), Mooreland Airport, Mooreland, Oklahoma (KMDF), Perryton Airport, Perryton, Texas (KPYX), West Woodward Airport, Woodward, Oklahoma (KWWR), the PIC shall contact the following facilities prior to operations and provide the NOTAM number, a point of contact and phone number:
- (1) KAVK – Vance RAPCON at 580-213-6765.
- (2) KGAG, KGUY, KMDF, KPYX, KWWR – Kansas City ARTCC at 913-254-8513.

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-udds.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. It is unlawful to take photos and/or video of military assets. The proponent must be familiar with and comply with 18 U.S. Code § 795 – "Photographing and sketching defense installations."

4. Procedural Requirements.

- a. UAS operations are prohibited in airspace underlying Class B, C, and D airspace or a Mode C veil.
- b. All operations within 5 NM from all public use airports listed above must be conducted at or below 700 feet AGL, unless prior coordination has been accomplished with the overlying FAA facility and the airport manager.
- c. It is the responsibility of the proponent to comply with all Federal, State and Local requirements when operating over publicly owned or controlled land and waterways. (i.e. National Parks, National Seashore, etc.)
- d. This COA does not authorize flight within the NOTAM defined military UAS flight restricted areas, authorized under CFR 14 Part 99.7.

I. Lost Link Emergency/Contingency Procedures.

1. Lost Link Procedures: ATC does not need to be notified provided the PIC complies with the following provisions:

- a. In the event that the data link is lost for at least three (3) seconds: The aircraft will land as soon as possible.
- b. The UA will remain within the NOTAM'ed Operations Area.
- c. The UA will not transit or orbit over populated areas.
- d. The UA will not interfere with the traffic pattern nor arrival/departure procedure of airports within the NOTAM'ed operations area.

2. Loss of Sight: If a VO loses sight of the UA, the PIC must be notified immediately. If the UA is visually reacquired promptly, the mission may continue. If not, the PIC must immediately terminate the operation.
3. Fly-Away Procedures: If a VO loses sight of the UA, the PIC must be notified immediately. If the UA is visually reacquired promptly, the mission may continue. If not, the PIC must immediately terminate the operation.
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

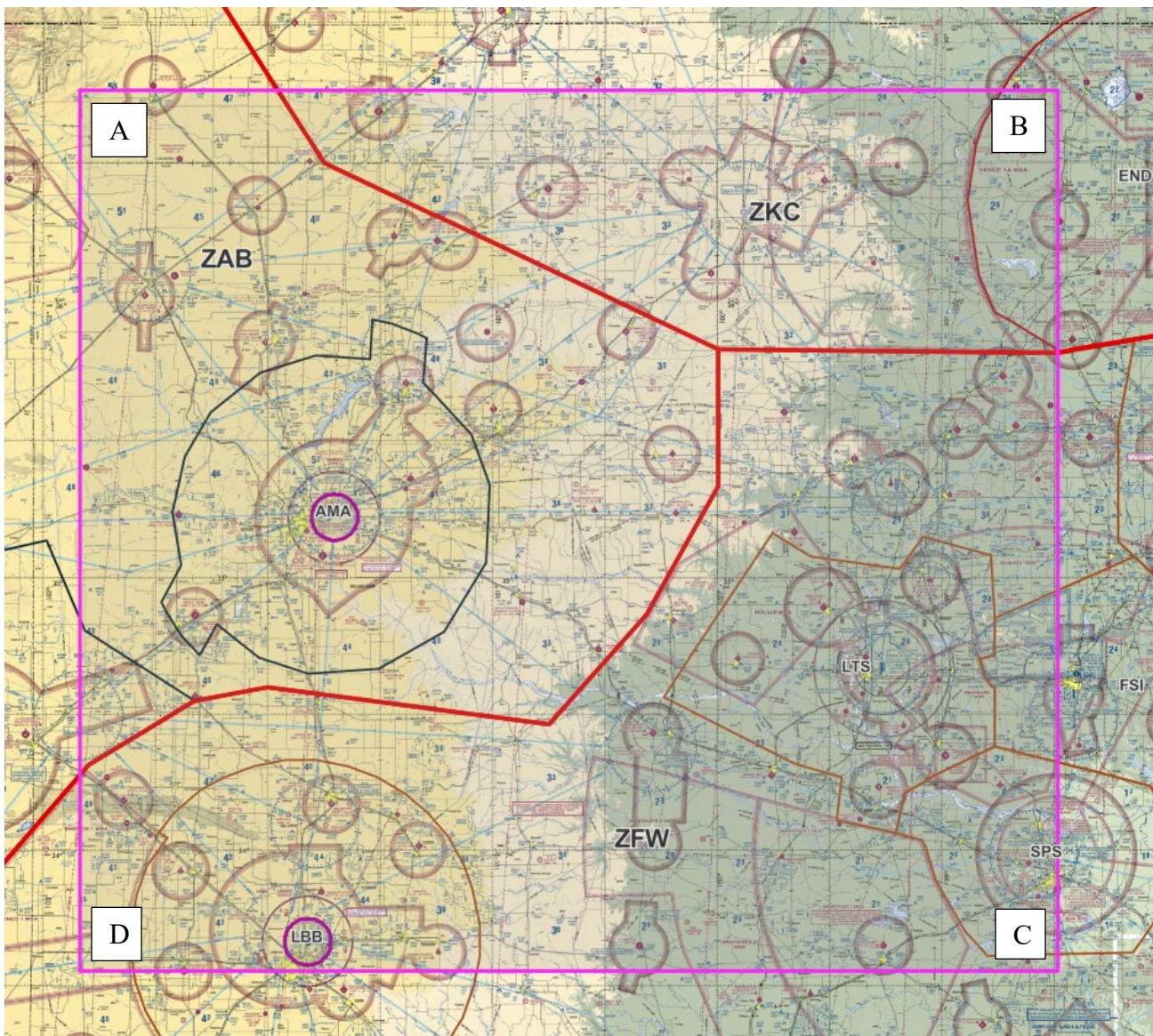
This Certificate of Waiver or Authorization does not, in itself, waive any Title 14 Code of Federal Regulations not specifically stated, nor any state law or local ordinance. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property 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 Unmanned Aircraft System in the NAS within the areas defined in the Operations Authorized section of the cover page.

Operations Area

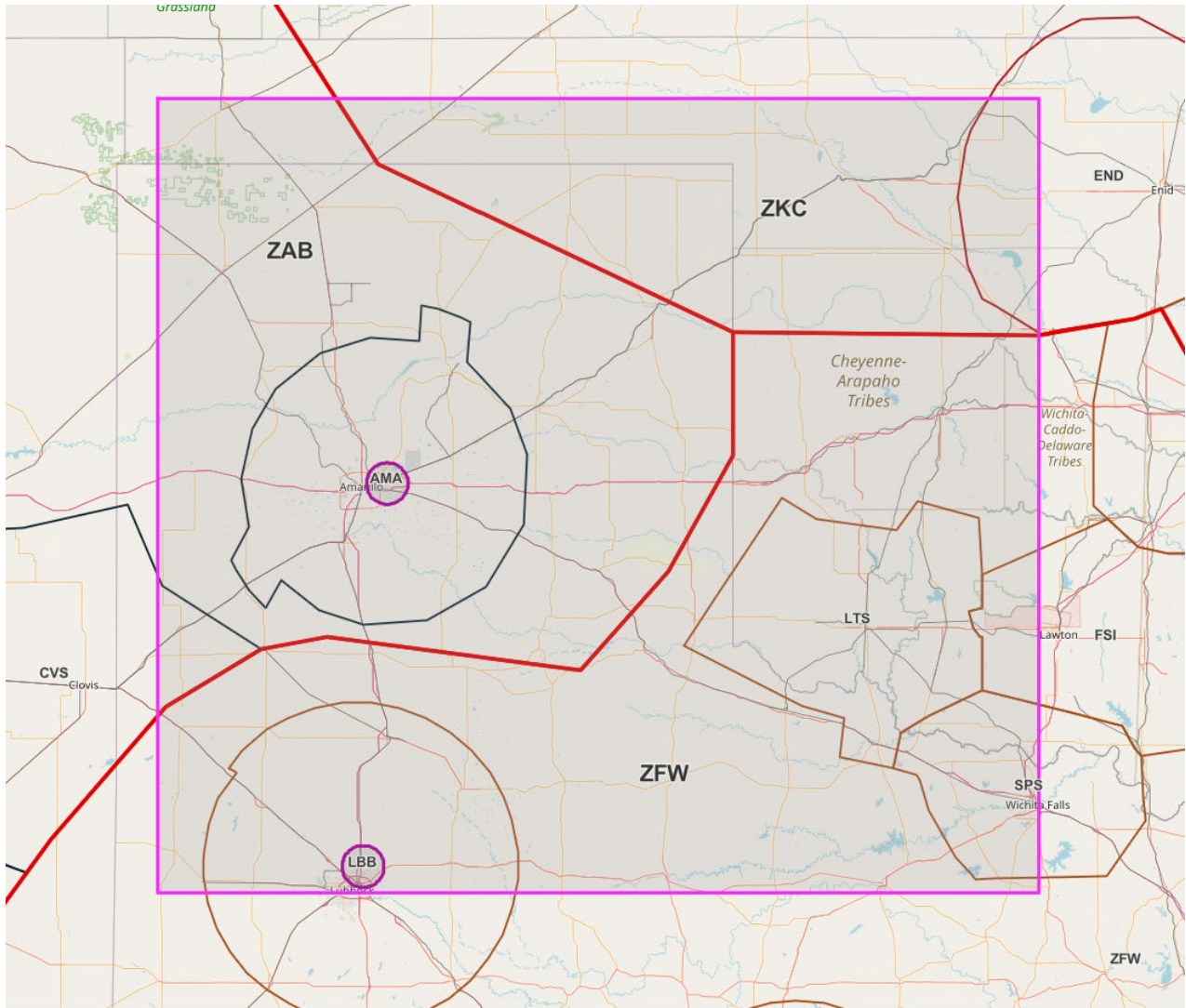
In Class E and G airspace at or below 2,500 feet AGL as depicted and defined below:

- A. $36^{\circ} 45'N$ $102^{\circ} 50'W$
- B. $36^{\circ} 45'N$ $98^{\circ} 30'W$
- C. $33^{\circ} 34.5'N$ $98^{\circ} 30'W$
- D. $33^{\circ} 34.5'N$ $102^{\circ} 50'W$

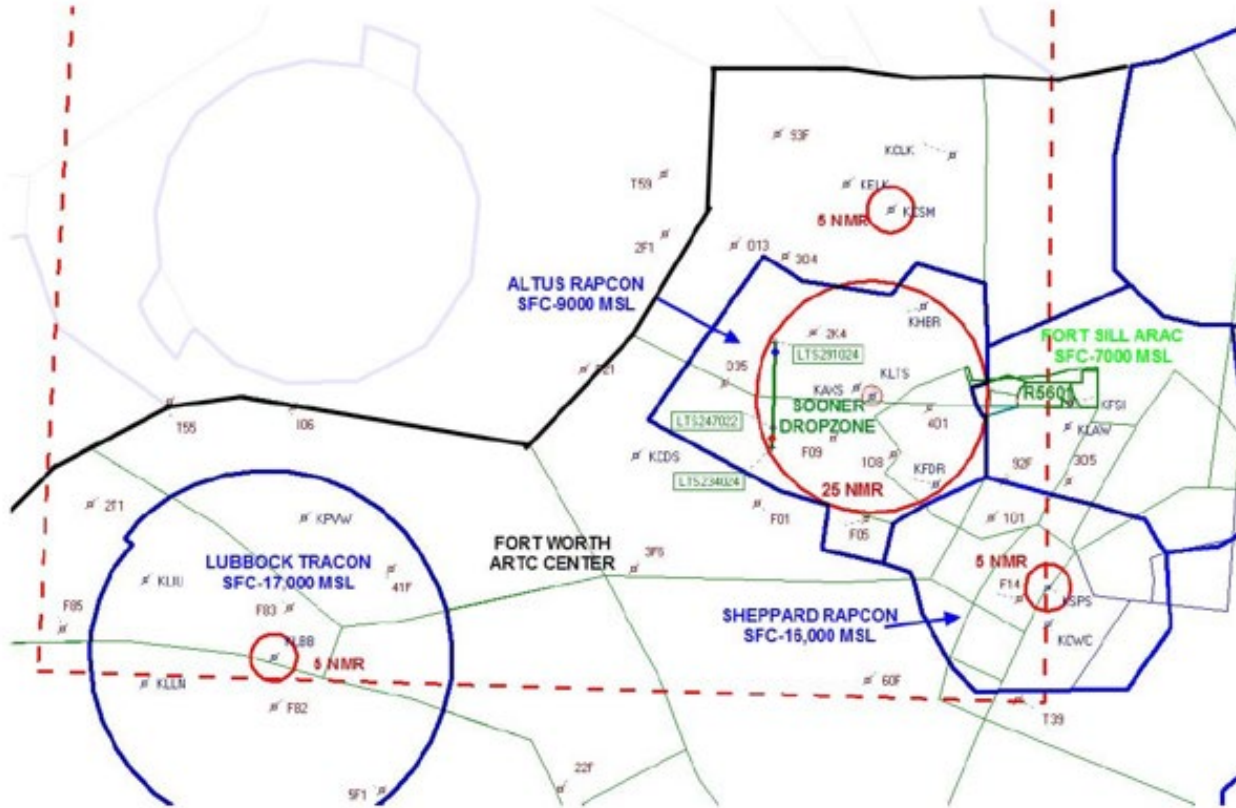
Map indicates exclusions for AMA and LBB Class C Airspace.
Exclusions for other airports and airspace are specified in the G. Operational Limitations.



TRACON, RAPCON and ARTCC Airspace
Exclusions for AMA and LBB Class C Airspace.



Fort Worth ARTCC, Lubbock TRACON, Altus RAPCON, Sheppard RAPCON, and
Fort Sill ARAC Airspace
SOONER DROP ZONE and R5601



R-5601

