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

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

May 4, 2015

Exemption No. 11450
Regulatory Docket No. FAA–2015–0126

Mr. Scott Lether
Operations Manager
Drone America, Inc.
3555 Airway Drive, Suite 310
Reno, NV 89511

Dear Mr. Lether:

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 January 12, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Drone America, Inc. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to aid and assist emergency personnel from hazardous conditions, bodily harm, and provide communication relay.

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 is a Drone America DAx8.

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 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. 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, Drone America, Inc.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.

Conditions and Limitations

In this grant of exemption, Drone America, Inc. 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 Drone America DAx8 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, 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 May 31, 2017, unless sooner superseded or rescinded.

Sincerely,

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

DRONE AMERICA

January 12, 2015

Docket Management Facility US Department of Transportation
1200 New Jersey Avenue, SE West
Building Ground Floor Room W12-140
Washington DC 20590-0001

RE: Section 333 Petition for Exemption

Dear FAA:

Drone America, Inc. petitions for relief of specific regulations with regards to airworthiness certification under Section 333, 14 CFR 11.81. The proposed request for exemption would allow for the use and operation of Unmanned Aircraft Systems (UAS) within the National Airspace (NAS) for emergency response. The application is to aid and assist emergency personnel from hazardous conditions, bodily harm and provide communication relay.

In the event of National, or local emergencies it may be deemed necessary for unmanned aircraft operations. Drone America request that the FAA approve an exemption based on a specific platform of size, weight, speed and limited operating range. Whereas, under normal circumstances might not otherwise conform to guidelines set forth in 8900.1, Volume 16, Chapter 5, Section 4 (16-5-4-3) and (16-5-4-5) for Emergency and National Disaster Operations.

Our request for exemption is based on public safety and integration to support firefighting, disaster relief, search and rescue, law enforcement, crew training and to participate in research of various National Aeronautics and Space Administration (NASA) and National Oceanic and Atmospheric Administration (NOAA) environmental studies. In the interest of public safety and research, to date the FAA has already authorized emergency service agencies limited use of unmanned aircraft for critical operations.

Operational control would remain within Drone America's Emergency Services Division in which "due regard" for rules, regulations and operational procedures will be adhered to. The purpose of issuance for an Emergency COA exemption is:

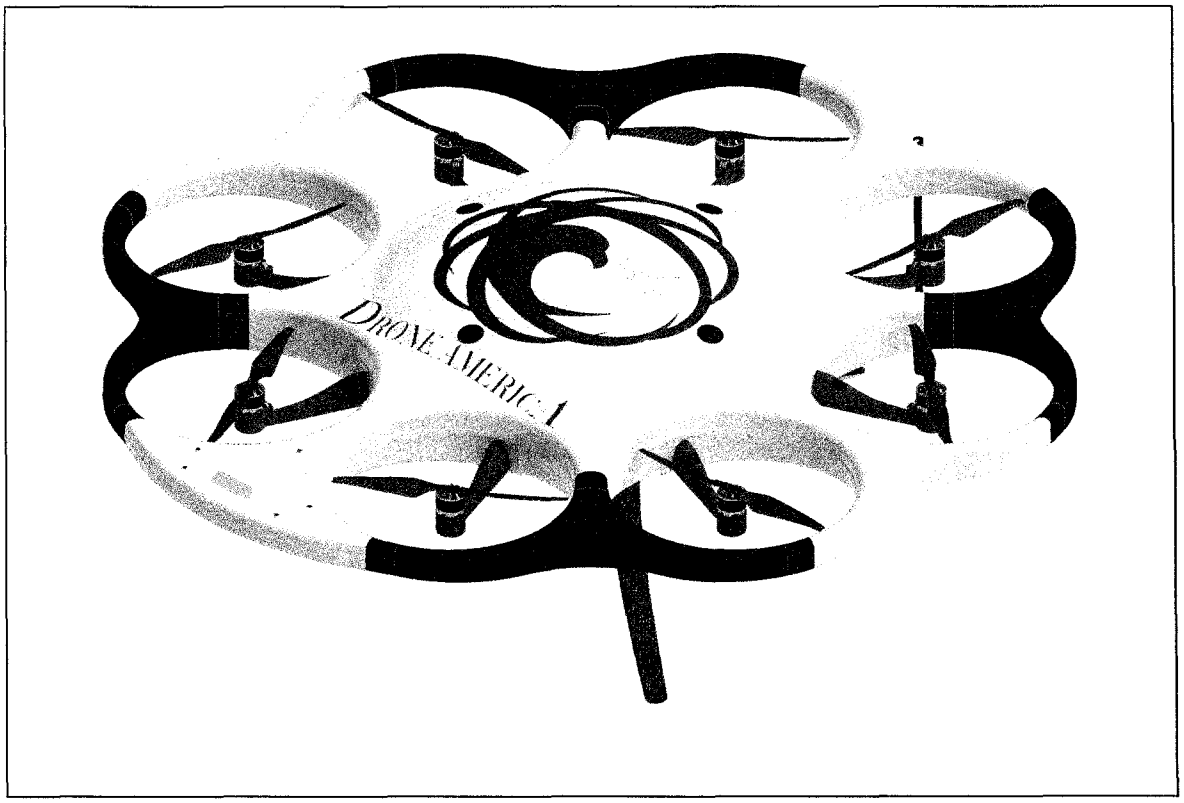
- An emergency situation that is defined as a condition of distress or urgency; or
- The proposed Unmanned Aircraft is operating under a current approved COA for a different purpose or location.

OR;

For non-emergency COA's is to request exemptions that fall outside of these parameters be considered for:

- Crew training
- Flights to test sensor capabilities
- Flights over congested areas
- Flights in Class C airspace

The platform in consideration for Section 333 Exemption is the DAx8. This platform is an eight-blade rotorcraft designed to assess and evaluate critical situations prior to releasing emergency response teams into hazardous conditions. Other capabilities of the DAx8 are ISR/IR applications for search and rescue operations that provide lightweight mobility and the ability for rapid deployment in life threatening situations.



DAx8

Sincerely,

Scott Lether

Scott Lether – Operations Manager
Drone America, Inc.
3555 Airway Drive Suite 310
Reno, NV 89511
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SECTION 333 PETITION FOR EXEMPTION

Drone America request relief from the following regulations in part or whole thereof:

PART 21 THAT DESCRIBES PROCEDURAL REQUIREMENTS FOR THE COMPLIANCE OF:

- Subpart G; Production Certificates
- Subpart H; Airworthiness Certificates
- Subpart I; Provisional Airworthiness Certificates
- Subpart K; Parts Manufacturer Approval
- Subpart L; Export Airworthiness Approvals
- Subpart N; Acceptance of Aircraft Engines, Propellers and articles for Import
- Subpart O; Technical Standard Order Approvals

PART 45 THAT REQUIRES IDENTIFICATION AND REGISTRATION MARKINGS:

Due to platform size and airframe configuration, 2" regulation markings will not fit in accordance with Part 45.11 and therefore, request for modification to comply with only Part 45.13 fire proof identification plate located on the inside of the platform.

The DAx8 is an unmanned aircraft and cannot meet the requirements for display of markings of this size, nor does the DAx8 have a door or cabin to display the word "Experimental".

PART 61.113 PRIVATE PILOT PRIVILEGES AND LIMITATIONS:

a) Except as provided in paragraphs (b) through (h), no person who holds a private pilot certificate may act as a pilot in command of an aircraft that is carrying passenger or property for compensation or hire; nor may that person, for compensation or hire, act as pilot in command.

b) A private pilot may, for compensation or hire, act as pilot in command of aircraft in connection with any business or employment if:

   1) The flight is only incidental to that business or employment; and

   2) The aircraft does not carry passengers or property for compensation or hire.

Drone America's request for relief of requiring a private pilots license and limitations is that the aircraft size, weight, speed and limiting operational range are contributing factors for that do not necessarily require a private pilots license to operate. The UA weighs less than 20 lbs. and does not exceed a maximum speed of 28 mph. The aircraft will be operated within a horizontal visual line of sight (VLOS) from the surface not to exceed 400 feet AGL. Operations are conducted from a handheld tablet through touch commands and waypoints with auto takeoff and landing capabilities. Operators are required to complete an FAA approve flight training ground school and hold a 2nd Class medical.

PART 91.7 CIVIL AIRCRAFT AIRWORTHINESS:

a) No person may operate a civil aircraft unless it is in airworthy condition.

b) The pilot in command of a civil aircraft is responsible for determining whether that aircraft is in condition for safe flight. The pilot in command shall discontinue the flight when unairworthy mechanical, electrical, or structural conditions occur.

Drone America's aircraft vehicle operators (AVO's) are responsible for the inspection and safe operation of the aircraft. Aircraft will be inspected prior to each flight and maintenance performed as necessary to ensure flight safety. Should the condition of safe flight not be met, resolved or repaired the flight will be terminated until discrepancies are corrected. See Section 11 – DAx8 Preflight and Checklist.

PART 91.9 CIVIL AIRCRAFT FLIGHT MANUAL, MARKING AND PLACARD REQUIREMENTS:

a) No person may operate a civil aircraft without complying with the operating limitations specified in the approved Airplane or Rotorcraft Flight Manual, markings and placards, or as otherwise prescribed by the certificating authority of the county of registry.

Request for relief is that the DAx8 is not capable of complying with Part 91.9, however, a flight manual with operating limitations and placards will be immediately accessible to the AVO during flight as prescribed.

PART 91.107 USE OF SAFETY BELTS, SHOULDER HARNESSES AND CHILD RESTRAINTS:

Part 91.107 Subpart B, is not applicable to Unmanned Aircraft.

PART 91.119 MINIMUM SAFE ALTITUDES:

Relief for exemption of minimum safe altitude is that emergencies can happen anywhere. This will require operations to be performed on the scene of the incident up to, but not exceeding 400 feet AGL. Mitigating factors will be considered prior to flight operations, and operational perimeter setbacks placed to ensure emergency personnel safety. Procedural protocols will be enforced to ensure proper operational parameters are adhered to.

PART 91.203 CIVIL AIRCRAFT: CERTIFICATIONS REQUIRED:

Drone America request relief for exemption of Part 91.203 in whole that the DAx8 is Experimental and does not require airworthiness certification based on size, weight, speed and limiting operating range. The DAX8 does not carry fuel or passengers.

PART 91.207 EMERGENCY LOCATOR TRANSMITTERS:

a) Except as provided in paragraphs (e) and (f) of this section, no person may operate a U.S. registered civil airplane unless –

1) There is attached to the airplane an approved automatic type emergency locator transmitter that is in operable condition for the following operations, except that after June 21, 1995, an emergency locator transmitter that meets the requirements of TSO-C91 may not be used for new installations.

The DAx8 is equipped with an audible lost aircraft alarm that notifies the operator of lost Comm in flight. In the event flight is non-recoverable the ballistic parachute is deployed and the operator may retrieve the aircraft if lost by listening for the alarm.

PART 91.405 MAINTENANCE REQUIRED:

Each owner or operator of an aircraft:

a) 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.

Drone America requests for relief of exemption of Part 91.405 (a) in part on the basis of the size, weight, speed and limited range of this unmanned aircraft.

Drone America's aircraft vehicle operators (AVO's) will be responsible for the inspection and safe operation of the aircraft. The aircraft will be inspected prior to each flight and maintenance performed as necessary to ensure flight safety. If the condition cannot be resolved or repaired the flight will be terminated until discrepancies are corrected.

PART 91.407 OPERATION AFTER MAINTENANCE, PREVENTIVE MAINTENANCE, REBUILDING, OR ALTERATION:

a) No person may operate any aircraft that has undergone maintenance, preventive maintenance, rebuilding, or alteration unless –

1) It has been approved for return to service by a person authorized under 43.7 of this chapter; and

Drone America requests for relief of exemption of Part 91.407 (1) in part on the basis that Drone America is the sole operator and the DAx8 is considered Experimental and the AVO is responsible for all maintenance, preventive maintenance, rebuilding and/or alterations.

PART 91.409 INSPECTIONS:

a) No person may operate an aircraft unless, within the preceding 12 calendar months –

2) It has had an inspection for the issuance of an airworthiness certificate in accordance with Part 21 of this chapter.

Inspections and preventive maintenance is performed prior to each flight, therefore, Drone America requests for relief of exemption of Part 91.409 (a)(2).

PART 91.417 MAINTENANCE RECORDS:

a) Each registered owner or operator shall keep the following records for the periods specified in paragraph (b) of this section:

1) Records of the maintenance, preventive maintenance, and alteration and records of the 100-hour, annual, progressive, and other required or approved inspections, as appropriate, for each aircraft (Including the airframe) and each engine, propeller, rotor and appliance of an aircraft. The records must include:

i) A description (or reference to data acceptable to the Administrator) of the work performed; and

ii) The date of completion of the work performed; and

iii) The signature, and certificate number of the person approving the aircraft for return to service.

2) Records containing the following information:

i) The total time in service of the airframe, each engine, each propeller and each rotor.

ii) The current status of life-limited parts of each airframe, engine, propeller, rotor and appliance.

iii) The time since last overhaul of all items installed on the aircraft which are required to be overhauled on a specified time basis.

iv) The current inspection status of the aircraft, including the time since the last inspection required by the inspection program under which the aircraft and its appliances are maintained.

v) The current status of applicable airworthiness directives (AD) and safety directives including, for each, the method of compliance, the AD or safety directive number and revision date. If the AD or safety directive involves recurring action, the time and date when the next action is required.

vi) Copies of the forms prescribed by 43.9(d) of this chapter for each major alteration to the airframe and currently installed engines, rotors, propellers, and appliances.

b) The owner or operator shall retain the following records for the periods prescribed:

1) The records specified in paragraph (a)(1) of this section shall be retained until the work is repeated or superseded by other work, or for 1 year after the work is performed.

2) The records specified in paragraph (a)(2) of this section shall be retained and transferred with the aircraft at the time the aircraft is sold.

3) A list of defects furnished to a registered owner, or operator under 43.11 of this chapter shall be retained until the defects are repaired and the aircraft is approved for return to service.

Drone America proposes a similar maintenance program that provides a general maintenance plan to maintain a safe condition for Unmanned Aircraft System (UAS) operations, with consideration for relief of a licensed aircraft mechanic to perform maintenance. The Aircraft Maintenance Manual (AMM) predicates the scope of maintenance to be performed by the AVO prior to each flight followed by a post flight inspection. The maintenance manual is a separately controlled document that describes and compiles the scope of detail and maintenance procedures recommended by the manufacture, Drone America, Inc. This program is developed to identify the maintenance and inspections to be performed progressively as each flight occurs. Major and minor components will require service, repairs and standard maintenance to maintain a condition of safe operations. To ensure flight safety and standards of safe conditions, the operator is required to use the Preflight Checklist as referenced in 81.30.34C; Appendix A for a Maintenance and Inspection Program.

Aircraft maintenance is recorded in the aircraft maintenance logbooks specific to that aircraft, describing all maintenance procedures and repairs as defined by the manufacturer's limitations. Maintenance, repairs and general conditions are in accordance with Title 14 CFR Part 43 Appendix D, as to the applicable aircraft and inspection schedules set forth by the aircraft manufacturer. The manufacturer's checklists and the Aircraft Maintenance Manual define inspection schedules and scope of details.

The Progressive Maintenance and Inspection program is predicated to continuous safety and is conducted on a routine schedule throughout a 12-month calendar year. Inspections are to be performed based on the hours of UA, or cycles of operations.

The inspection program prescribed is to be performed by a person who is an authorized manufacture's technician. The authorized technician is required to inspect the aircraft, document the findings and record all required maintenance, and return to service in a safe condition for flight. Inspections shall be done in compliance with 14 CFR 43.13 Appendix D and in accordance with the manufacturer's inspection checklist.

UMANNANED AIRCRAFT SYSTEM OPERATIONS

1. OPERATIONAL AND DESIGN CHARACTERISTICS:

DAx8 is a VTOL (Vertical Takeoff and Landing) class aircraft. This UA is made of light-weight composite material for structural strength and increased payloads that is intended for hovering and low speed normal flight configurations. Configured as a land base Unmanned Aircraft Vehicle (UAV) this robust multi-rotor aircraft is designed for commercial, industrial and ISR applications. The unique 8 rotor configuration allows the DAx8 to carry a large payload while providing more safety and redundancy to the system. The advance software and GPS guidance system provide the aircraft with self-stabilizing capability and multi-waypoint navigation. The DAx8 is powered by eight electric brushless motors that produce high level performance and thrust. The aircraft is intended to carry payloads such as atmospheric sensors, surveying sensors, mapping equipment, and high definition stabilized video and data links.

Structural analysis and physical characteristics of the aircraft and electric motor analysis demonstrates that the airframe is capable of a thrust range of 19.9 to 29.2 pounds of thrust. Through indoor flight testing the DAx8 will be evaluated in various flight maneuvers, and is not capable of fluttering throughout the flight envelope due to the lack of moving parts.

Throughout flight test parameters, stress analysis will provide data for positive or negative structural integrity. Based on other flight experience with similar platforms, flight data has not presented any unsafe conditions that would cause concern for safety while conducting flight within the normal category as defined in the user's manual.

The airframe is constructed from 100% composite material, laid up in CNC molds utilizing standard wet layup bagging method. The carbon fiber airframe typically consists of four-layers that is applied one layer at a time, utilizing standard composite layup practices of sequenced alternating layers. The carbon fiber layup is alternated in a unilateral direction of 0° and 45° bias layers, which provides a light weight durable airframe capable of withstanding harsh environments and abuse.

Manufactured parts are vacuum bagged and oven baked to a temperature of 160° and temperature controlled through a ramped up and ramped down process to assure proper cure as instructed per the resin manufacturer.

Work is performed in accordance with AC 20-107B as guidance and in compliance with 14 CFR Part 23.

UAS Preflight Operations:

Preflight planning is a multi-task process requiring weather briefing, mission planning, preflight safety checklist, and UAS walk-around inspections.

Weather Briefings:

Weather briefings may be obtained through various sources:

- Flight Service Station (FSS)
- Telephone Information Broadcast System (TIBS)
- Transcribed Weather Broadcast System (TWEBS)
- Direct User Access Terminal System (DUATS)

Weather analysis must be recorded prior to each flight and logged on the following weather analysis tables denoting current and forecasted conditions within the time of the operation.

Regional weather updates may be obtained within the vicinity of the airport or the operation area by contacting these agencies to obtain current weather information and verify suspected deteriorating conditions:

- The Automated Weather Observation System (AWOS)
- Automated Terminal Information Service (ATIS)

The Mission Commander must present a detailed mission plan prior to the mission outlining the scope and objectives of the operation. The Mission Commander in conjunction with the Operations Manager is responsible for the development and the outcome of the operation.

The initial scope of preflight planning objectives will be developed as part of the operational flight testing, development and eventual marketing. This provides for expectations to be readily met, or exceeded in the operational preflight and planning process. Preflight communications amongst crewmembers and Operation Managers establishes the objective of the mission criteria and expectations.

In the preflight briefing the Operations Manager will assign a Mission Commander for the test operation to be responsible for organizing personnel, UAS systems and equipment for the mission. Should the Mission Commander find the resources to conduct the mission adequately and safely are unavailable, he is to notify the Operations Manager to resolve the problem/s.

At the time the Mission Commander is assigned the responsibility of the operation, he becomes the point of contact for all mission-related issues. The Mission Commander must discuss mission objectives, weather and address any requests in regards to the mission. The Mission Commander must keep record of all correspondence and documentation pertaining to the test operations.

The Mission Commander must brief all personnel before the commencement of the test operations and allocate duties at this time. The briefing should take place before departure if operations are at a remote site.

All personnel and support crew must be briefed on:

- Mission objectives
- Crew Duties and responsibilities
- Operating conditions
- Flight planning
- Perceived difficulties (if any)
- Emergency procedures
- Currency and training requirements
- Flight Planning

Flight planning shall be the responsibility of the Mission Commander and is considered a key factor in the success of every operation. The Mission Commander must consider weather, UAS payloads, performance, and battery endurance. No person may begin a flight in the UA under VFR, or IFR conditions unless consideration for meteorological conditions is taken into consideration and conditions have been calculated to determine there is adequate battery life to complete the planned mission and return to the scheduled point of landing under normal operational speed. In addition, backup batteries must be fully charge and available for replacement when necessary for the duration of the operation.

Payloads:

The DAx8 payload is client specific and the DAx8 is capable of carrying a wide range of payloads weighing up to 4.4 pounds, including stabilized EO/IR gimbal, multi-spectral sensors, geo-imaging payload, etc.

Due to the nature of UAS operations with a wide range of payloads, all internal and external payloads require the UA to have weight and balance calculation prior to every flight. The payload compartment is located in the center of the aircraft, directly over the desired CG, making this task straightforward.

Flight:

All commands during flight operations are directed and changed via the GCS software controls interface in real-time.

i. During flight, the AVO monitors telemetry data and makes appropriate changes in altitude, speed, heading and waypoints using keyboard/touch screen inputs and/or mouse point and click commands. Additionally, the AVO can also control the UA using a stylus for point and touch to control the UA's direction.

ii. The systems required for normal flight operations include the GCS, the ground side data link and associated antennas, the autopilot and 3D GPS, static air pressure sensor, and air data link.

iii. Critical process points include:

- Adequate number of GPS satellites acquired to provide 3D solution
- Functional primary communication data link
- Functional autopilot Flight Core and IMU
- Current maps and weather data are loaded on the GCS
- Batteries are fully charged prior to takeoff
- Motors are inspected for proper rotation direction and correct propeller orientation is verified.
- Sensor/payload is installed correctly and securely.

a. The DAx8 control mode is selected by the flight mode switch on the AVO Hand Held Controller, or by selecting the flight mode in the ground station user interface. The flight control modes available depend upon the hardware installed. The following three options for flight modes are available:

1. Manual - Direct control via RC controller
2. Attitude mode - Autopilot self-levels the aircraft, while still being guided by the AVO
3. Autonomous - Fully controlled via the autopilot and uploaded waypoint set

b. The control panel screen will display the control mode of the UA.

c. In-Flight Plan Deviations:

In-flight deviations are made through the autopilot system. The course is quickly changed through the Command Loops screen by setting a new waypoint and commanding the UAV to track to the new course. The autopilot will ask the AVO to confirm this command prior to making the deviation. The flight plan may also be changed through the EFIS by sliding, or clicking on the altitude, airspeed and heading bugs to set a new course. These methods also require a confirmation by the AVO prior to execution of the command.

d. Lost Communications:

A VHF communication radio allows for a communication link to ATC or the controlling agency. Additionally, there are also handheld air band radios in case of lost communication to ATC or controlling agency. If communication is lost with ATC, or the controlling agency the UA will maintain last flight plan, or return to base via pre-determined/pre-planned routes until communication with ATC, or the controlling agency is re-established.

4. Landing and Recovery:

   Landing is performed in the same way as takeoff or launching in a hovered configuration.

5. Post Flight:

   a. Systems required for safe post flight operations include aircraft retrieval, aircraft shut down, proprietary equipment properly stored and the aircraft secured.

      i. After each flight the UA will be plugged in so that its onboard telemetry data can be downloaded and a visual inspection can be performed.

      ii. During post flight, prior to power off, the data from the autopilot must be downloaded for future replay in software in loop simulation.

      iii. Post flight inspection

         - Inspect for visible damage from hard landings/debris ingestion into propellers (bugs, rocks, sand etc).
         - Inspect all exposed fasteners and screws for security.
         - Inspect camera/payload/sensor for any damage.
         - Inspect batteries and wiring for excess heat generation which may suggest a pending failure.
         - Inspect all antennae and exposed equipment to ensure they are free of damage.

   b. Post flight inspection happens after the electric motors are shut down and the DAx8 power is OFF. The Crew Chief will conduct a visual walk around inspection of the aircraft and connect the data terminal cable from the GCS to the aircraft to download the flight telemetry.

6. Operating History:

   Currently the DAx8 is in production with a projected rollout in early December 2014. Initial test flights have been conducted indoors at Drone America's production facility. Initial gain tuning has been completed and stable flight has been demonstrated. Initial flight testing will be performed in an indoor arena. Flight testing will continue indoors until authorization is approved for outdoor testing.

2. Maintenance, Inspection and Repairs:

Refer to page 7 for the description of the maintenance, inspection and repairs procedures.

Prescribed Maintenance Procedures:

LIST OF EFFECTIVE PAGES

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	Contents	v, vi	Original	17Sept2014
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	Conditions for Return to Service	76	Original	17Sept2014
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3	**Owner/Operator Attitude**	77	Original	17Sept2014
4	**DATA**	77	Original	17Sept2014
5	**Records**	77 & 78	Original	17Sept2014
6	**General Access and Conditions**	79	Original	17Sept2014
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8	**Portable Ground Control Station**	79 &80	Original	17Sept2014
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12	**Aircraft Exterior Inspection**	82	Original	17Sept2014
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20	**Conditions of Inspection Statement**	86	Original	17Sept2014
21	**Weight and Balance Sheet**	87	Original	17Sept2014
22	**Airworthiness Directive Sheet**	88	Original	17Sept2014
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23	**Appendix B**	1-B	Original	17Sept2014
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REVISION PAGE CONTROL SHEET

Removed Pages	Effected Page Description	Date	Inserted Pages	Effected Page Description	Date

Progressive Inspection Checklist

Current date of issue: September 16, 2014
Reference Data:

FAA Order 8130.34C, CFR 21 Certification Procedures for Products and Parts CFR 23 Airworthiness Standards, CFR 43 Maintenance, CFR 45 Markings, CFR 47 Registration, CFR 39 Airworthiness Directives, CFR 91 Subpart E, Maintenance, Preventative Maintenance and Alterations, CFR 145 Repair Stations, AC 43.13-1B Acceptable Methods, Techniques and Practices and 2B Major Repair and Alterations and the Manufacture's Maintenance Manual.

Conditions for Return to Service

1) The unmanned aircraft system (UAS) must be returned to service in condition for safe operation. Inspection is to ensure that the aircraft is not subject to unusual wear, structural damage and/or system malfunctions.

2) Aircraft configuration and components installed must be consistent with manufacturer's drawings, specifications and other data that are part of the equipment list.

NOTE: ***If either of these conditions are not met, the unmanned aircraft would not be considered safe for operation and cannot be returned to service.***

NOTE: ***This is a manufactures reference guide for a Progressive Condition inspection checklist specific to Drone America's experimental Unmanned Aircraft. This checklist has not been approved by the FAA at the time of publishing this original document. Reference to the manufacturer's maintenance manual is not exhaustive and consideration to CFR 43 Appendix D should be consulted. Inspection checklists are updated periodically and personnel performing safety inspections should reference www.droneamerica.com maintenance for update revisions prior to inspections.***

The owner/operator is responsible for maintaining the UAS in a safe condition, including compliance with all manufacturer's directives and operating limitations. The owner/operator is also responsible for the inspection of the UAS system to insure that the aircraft is in compliance with CFR 23 Airworthiness Standards, and CFR 43 Aircraft Maintenance.

UAS Aircraft Data:

UAS Model: _____
N-Number: _____
Serial Number: _____
Year: _____

Owner/Operator Attitude:

Does Owner/Operator have a constructive attitude toward Compliance?
Order 2150.3A Par. 205 Yes ☐ No ☐ N/A☐

Verify Maintenance Technicians authorization
CFR 65.91 Yes ☐ No ☐ N/A☐

DATA:

1. Manufacturer's Maintenance Manuals available? Yes ☐ No ☐ N/A☐
2. Alterations – By what means are they approved? Manufacture ☐ Field Approval ☐ or Other ☐
3. Instructions for continued safe operations? Yes ☐ No ☐ N/A☐
   CFR 23.1529
4. Aircraft Flight Manual? Yes ☐ No ☐ N/A☐
   AFM Date: _____/Rev#____
5. Aircraft Placards Yes ☐ No ☐ N/A☐
   CFR 45.13
6. Verify all eight motors make/model are the same:
   Motors: KDE2814XF-775
   CFR 45.11

   1-Hours: _____
   2-Hours: _____
   3-Hours: _____
   4-Hours: _____
   5-Hours: _____
   6-Hours: _____
   7-Hours: _____
   8-Hours: _____

7. Verify critical component placards and serial numbers. Yes ☐ No ☐ N/A☐

8. Verify life limited parts placards. Yes ☐ No ☐ N/A☐

Records:

1. Verify current Ground Control Station software updates Yes ☐ No ☐ N/A☐
   CFR 91.9

2. Verify Experimental Airworthiness Certificate in GCS (Original Issue) Yes ☐ No ☐ N/A☐
   CFR 91.319

3. Previous inspection:
   Total time: _____
   Date completed: _____
   Certified Maintenance Technician # _____: Yes ☐ No ☐ N/A☐
   CFR 43.11, 91.417

4. Verify current and reoccurring AD's – Record in Aircraft maintenance logbooks:
   1. Airframe Yes ☐ No ☐ N/A☐
   2. Motors Yes ☐ No ☐ N/A☐
   3. Propellers Yes ☐ No ☐ N/A☐
   4. Appliances – See additional pages if applicable Yes ☐ No ☐ N/A☐
      CFR 91.417

5. Verify status of life limited parts. Go to: www.droneamerica.com maintenance for Effective Date: _____
   CFR 43.10

6. Verify current Aircraft Flight Manual (AFM) is available Yes ☐ No ☐ N/A☐
   CFR 91.9

7. Verify current weight and balance sheets are available
   Verify signature and date. Yes ☐ No ☐ N/A☐

8. Verify ID plate is secured to UAS fuselage exterior. Yes ☐ No ☐ N/A☐

9. Verify maintenance records for each motor, propeller, airframe and appliance is in accordance with CFR 91.417. Yes ☐ No ☐ N/A☐

10. Verify ATC Transponder/w ADS-B has been checked within the past 24 calendar months per CFR 91.413 Yes ☐ No ☐ N/A☐

11. Verify autopilot/altimeter has been checked within the past 24 calendar months per CFR 91.411, 43 Appendix E Yes ☐ No ☐ N/A☐

12. Verify autopilot-pitot/static system has been tested within the Past 24 calendar months per CFR 43 Appendix F — Yes ☐ No ☐ N/A☐

13. Record deferred items per Part 91 for daytime VFR operations:
    a. Is the component placarded? — Yes ☐ No ☐ N/A☐
    b. Is there a maintenance record entry? — Yes ☐ No ☐ N/A☐
    c. Is the component disabled or removed? — Yes ☐ No ☐ N/A☐

General Access and Conditions:

a. Remove lower airframe hatches — Yes ☐ No ☐ N/A☐

b. Remove optical payloads — Yes ☐ No ☐ N/A☐

c. **LOCK OUT** - Install "T" pin in ballistic recovery parachute — Yes ☐ No ☐ N/A☐

General Cleanliness:

1. Wash/Clean exterior of aircraft — Yes ☐ No ☐ N/A☐

2. Clean aircraft interior — Yes ☐ No ☐ N/A☐

3. Clean all motors and propellers — Yes ☐ No ☐ N/A☐

Portable Ground Control Station Inspection:

1. Verify placards are correct and readable per the AFM. — Yes ☐ No ☐ N/A☐
   CFR 23.1541 – 1567, CFR 91.31

2. Verify INOP placards: — Yes ☐ No ☐ N/A☐
   CFR 91.213
   a. INOP instruments may only be disabled or removed by an A & P. — Yes ☐ No ☐ N/A☐
   b. Verify current equipment list. — Yes ☐ No ☐ N/A☐
   c. Verify maintenance records entries are updated. — Yes ☐ No ☐ N/A☐
   d. Verify Weight and Balance records are current. — Yes ☐ No ☐ N/A☐
      CFR 91.9

3. Verify compass is correct in the primary flight display as shown in Electronic Flight Instrument System (EFIS). Yes ☐ No ☐ N/A☐

4. Verify clock is set to the correct time zone on the monitor panels. Yes ☐ No ☐ N/A☐

5. Verify Handheld Nav Radios Part Numbers:
   a. P/N 1 _____ Yes ☐ No ☐ N/A☐
   b. P/N 2 _____ Yes ☐ No ☐ N/A☐

6. Verify Transponder Part Number:
   a. P/N _____ Yes ☐ No ☐ N/A☐

7. Verify there are no unusual odors (Such burning electrical smells). Yes ☐ No ☐ N/A☐

8. Verify Portable Ground Control Station registration concurs with Data plate. Yes ☐ No ☐ N/A☐

9. Verify fire extinguisher is charged, properly rated and accessible. Yes ☐ No ☐ N/A☐

10. Verify speed controllers are operational. Yes ☐ No ☐ N/A☐

11. Verify throttle travel is not restrictive and consistent with RPM, figures (If applicable) on the Controller Configuration Screen. (Perform motor run-up – Idle, advance to max. RPM, back to Idle) Yes ☐ No ☐ N/A☐

12. Verify condition of Portable Ground Control Station. Yes ☐ No ☐ N/A☐

13. Verify electrical wires are properly identified. Yes ☐ No ☐ N/A☐

14. Verify there are NO loose electrical connections. Yes ☐ No ☐ N/A☐

15. Verify electrical wires are secure. Yes ☐ No ☐ N/A☐

16. **Instruments:** Airware Autopilot System
    CFR 91.205
    a. Verify autopilot-altimeter has been tested within 24 calendar months. Yes ☐ No ☐ N/A☐
    CFR 91.411
    b. Verify Electronic Flight Instrument System has been tested within the past 24 calendar months. Yes ☐ No ☐ N/A☐
    c. Verify Direction Indicator is accurate per Airware Systems. Yes ☐ No ☐ N/A☐

d. Verify the operations of the following flight instruments have been inspected per Airware's inspection program:

1. Airspeed Indicator Yes ☐ No ☐ N/A☐
2. Altimeter Yes ☐ No ☐ N/A☐

Aircraft Electrical System:

1. Verify condition of aircraft switch. Yes ☐ No ☐ N/A☐

2. Verify voltage and current draw (System Status Monitor). Yes ☐ No ☐ N/A☐

3. Inspect aircraft wire harnesses for: AC 43.13 Ch. 11

a. Chafed or frayed wires Yes ☐ No ☐ N/A☐
b. Insulation penetration Yes ☐ No ☐ N/A☐
c. Outer insulation cracking Yes ☐ No ☐ N/A☐
d. Damaged or exposed wires Yes ☐ No ☐ N/A☐
e. Evidence of overheating Yes ☐ No ☐ N/A☐
f. Evidence of arcing Yes ☐ No ☐ N/A☐
g. Evidence of chemical contamination Yes ☐ No ☐ N/A☐

4. Verify aircraft wires are properly labeled. Yes ☐ No ☐ N/A☐

5. Verify aircraft wires are marked by gage size. Yes ☐ No ☐ N/A☐

6. Inspect bus bar for burned or tripped conditions. Yes ☐ No ☐ N/A☐

7. Verify grounding point nuts are tight and free of corrosion. Yes ☐ No ☐ N/A☐

8. Verify wires are properly clamped and secure. Yes ☐ No ☐ N/A☐

Aircraft Equipment/Furnishings:

1. Verify installed equipment functions properly. Yes ☐ No ☐ N/A☐

2. Verify correct Flight Manual for applicable aircraft being operated from the Portable Ground Control Station is available. Yes ☐ No ☐ N/A☐

3. Verify batteries are charged. Yes ☐ No ☐ N/A☐

4. Verify batteries are properly secured. Yes ☐ No ☐ N/A☐

5. Verify backup batteries are charged. Yes ☐ No ☐ N/A☐

6. Visually inspect ballistic recovery parachute. Yes ☐ No ☐ N/A☐

7. Visually inspect autopilot for security and no adverse conditions. Yes ☐ No ☐ N/A☐

Miscellaneous Airframe Inspection:

1. Verify antenna connections. Yes ☐ No ☐ N/A☐

2. Inspect for corrosion on, or around antenna connections. Yes ☐ No ☐ N/A☐

3. Inspect hatch seals for cleanliness, cuts, or abrasions. Yes ☐ No ☐ N/A☐

4. Inspect lower hatch fastener blind nuts and hardware. Yes ☐ No ☐ N/A☐

Aircraft Exterior Inspection:

1. Inspect airframe for delamination, pin holes, cracks, blisters and chipped paint. See manufactures AMM for acceptable limits. Yes ☐ No ☐ N/A☐

2. Inspect registration markings. (Replace or repair if required) CFR 45.22(b) Yes ☐ No ☐ N/A☐

3. Inspect beacon. Yes ☐ No ☐ N/A☐

4. Inspect condition of navigation lights. Yes ☐ No ☐ N/A☐

Landing Gear Inspection:

1. Lift aircraft and turn over to inspect landing gear for bent, fatigued or cracked struts. Yes ☐ No ☐ N/A☐

2. Inspect for overweight landings. See Special Inspections and AMM for procedures. Yes ☐ No ☐ N/A☐

Electric Motor Inspection:

1. Perform a motor inspection by visually checking for debris in the windings or bearings. Physically turn the propellers to ensure smoothness of operation. Yes ☐ No ☐ N/A☐
   CFR 43.15
2. Inspect motor control arms for cracks or delamination's. Yes ☐ No ☐ N/A☐
3. Inspect condition of motor wires. Yes ☐ No ☐ N/A☐
4. Inspect overall condition of motors Yes ☐ No ☐ N/A☐

Battery Systems:

1. Inspect condition of battery cells. Yes ☐ No ☐ N/A☐
2. Verify batteries are secure. Yes ☐ No ☐ N/A☐
4. Verify batteries are charged. Yes ☐ No ☐ N/A☐

Propellers:

The DAx8 uses 8 counter rotating propellers; 4 CW and 4 CCW. These alternate in rotation direction. The #1 propeller is the front left. This is a CW propeller as viewed from above. Each consecutive propeller should alternate from CW to CCW to CW as inspected in a clockwise fashion around the perimeter of the DAx8. Each propeller should be inspected as follows:

1. Verify correct propeller rotation direction and orientation (thrust direction)
2. Inspect propellers for physical signs of damage or abuse
3. Check that propeller bolts are tight

Propeller type: Fixed
Propeller Material: Composite

1. Is the propeller maintenance record logbook available? Yes ☐ No ☐ N/A☐
2. If there is no propeller maintenance logbook, sign inspection off in Airframe Logbook. Yes ☐ No ☐ N/A☐
3. Inspect propellers condition for nicks, cracks and delamination's. Yes ☐ No ☐ N/A☐

4. In the event of propeller damage, remove and replace propeller. Yes ☐ No ☐ N/A☐
   Special Inspection: In the event of propeller damage, DO NOT attempt to repair. Yes ☐ No ☐ N/A☐

5. Verify proper propeller screws are used per manufacturer's recommendations. Yes ☐ No ☐ N/A☐

Ground Control Station Equipment/Furnishings:

1. Panasonic Tough Pad S/N _____
2. COMMS 1 & 2 – Garmin/GTR 225 S/N _____
3. Airware Autopilot Systems S/N _____
4. SageTech XPS-TR Mode S with ADS-B Out Transponder S/N _____
5. Video Receiver - S/N _____
6. Video and Voice Recorder - S/N _____
7. Ground Data Terminal GDT 2100 – TECOM Industries. S/N _____
8. Spectrum Analyzer - S/N _____
9. Range Attenuator - S/N _____
10. Antenna Selector Control - S/N _____
11. Verify Portable Ground Control Station batteries are charged. Yes ☐ No ☐ N/A☐
12. Verify Portable Ground Control Station is connected to main power supply. Yes ☐ No ☐ N/A☐
13. Verify Ground Control Station Operating Handbook is readily available. Yes ☐ No ☐ N/A☐
14. Verify Aircraft Flight Manual (AFM) is applicable to aircraft currently being operated. Yes ☐ No ☐ N/A☐
15. Verify current aircraft registration. Yes ☐ No ☐ N/A☐

Special Inspections: Occurrence	**Inspection**
1. Structural Damage Inspection:	Immediately

Visible damage to the skin of the DAx8 less than a quarter of an inch in diameter is not considered structural damage. Damage exceeding more than a quarter of an inch in diameter, consult the AMM for engineered fix. If aircraft has experience hail damage, consult engineering prior flight.

The structural components which could be damaged are within the central compartment of the DAx8, and must be inspected each landing for signs of cracking and wear. Any damage in the landing gear or motor arm mounting areas is considered out of limits of safe operations and must be repaired.

2. Hard landing inspection: Immediately

Gear Struts - Perform the following inspection:

I. Inspect landing gear screw location holes for elongation.
II. Inspect airframe structure for structural cracks, delamination or splintering around gear attach points.
III. Inspect each gear strut to ensure they are not bent, or cracked
IV. If struts are bent, elongated bolts holes or cracked, Remove and Replace.

3. Overweight landings. N/A

the DAx8 cannot land overweight as its weight does not change during flight. Maximum takeoff weight is significantly less than the maximum landing load expected during normal operation.

4. **Lightning strike damage. (Airframe & Electronics Inspection)** Upon landing

In the event of lightning strike damage, inspect structure for burns, blisters and delamination. Consult the AMM for structural repairs. All electronics must be returned to Drone America for inspection.

5. **Severe turbulence inspection.**

The DAx8 is not intended to fly in areas of severe turbulence. Its configuration however is not typically susceptible to overload due to turbulence. Controllability may be affected, but structural damage is highly unlikely.

Condition of Inspection Statement:

No person may sign-off any repair, alteration, or modification to this aircraft unless they are a qualified mechanic that has been authorized by the manufacture as a Maintenance Technician. The Maintenance Technician must provide a statement of release prior to returning the aircraft to service.

I certify that this aircraft has been inspected on _____20_ _ in accordance with the scope and detail of 14 CFR 43, Appendix D and Drone America's Aircraft Maintenance Manual (AMM), and have found to be in a condition for safe operation in compliance with FAA's acceptable maintenance and 100-Hour Inspection Program.

Aircraft total time: _____

A & P: _____
Print
_____ ***Lic. #*** _____
Signature

Maintenance Technician: _____
Print
_____ ***Auth. #*** _____
Signature

WEIGHT and BALANCE SHEET

Date: _____

Aircraft Make/Model: _____

Serial Number: _____

Removed Equipment	Weight	Arm	Moment
Total			

Installed Equipment	Weight	Arm	Moment
Total			

Forward Limit Check (Limit?)			
A/C Empty	Weight	Arm	Moment
Payload			
Total			

Performed By: _____

Signature: _____

Mechanics License #: _____

3. Communication and Frequencies:

1. The MicroHard control system architecture is described below:

   The primary data and pilot link is a 902 – 928MHz spread spectrum frequency band with 400 kHz increment and an approximate 175kpbs data rate. The data link is configurable between 1Hz, 10Hz and 25Hz telemetry data update rate.

2. Communication data links used on Drone America's DAx8

   a. Data link descriptions:
   The 2.4Ghz spectrum will be used for command and control, as well as, potentially video downlink for the DAx8. The Microhard 2.4Ghz Nano series n2420 will be used. Spectrum approval is not needed as 2.4Ghz is open to the public under FCC Part 15.247, IC RSS210, CE.

   b. The Microhard Nano series radio is not encrypted as standard, but has the ability to support both 128bit and 256bit AES encryption in the USA, and with permit for use outside the US and Canada.

   c. The primary command and control 2.4GHz data link has range up to 10 miles with the Omni antenna, and up to 40 miles with Yagi directional tracker antenna. The range was determined by the autopilot manufacturer through extensive testing. The DAx8 is not expected or intended to operate at a distance greater than 3 miles from home base.

      Primary flight telemetry data such as airspeed, altitude, attitude, and position have precedent over all other telemetry. Telemetry update rate is selectable between 1Hz, 10Hz and 25Hz.

   d. The radio signal strength indication is displayed on the system window and the value is measured by the GCS software and displayed on the Radio Signal Strength Indicator (RSSI) with typical operational range of -71 to -115.

   e. The DAx8 is not currently equipped with redundant control links. At the intended operating range, the single Microhard data link is very robust. In the event a lost link situation should occur, the lost link procedures pre-programmed into the autopilot are executed. This includes a return to home command. Should link be lost, the UAV will automatically head home, therefore reducing range, and typically the link will be re-established.

   f. The DAx8 does not use satellite communications for command and control.

   g. Due to the sparsely populated location of operations there are no foreseen interferences from any outside influences that would affect UA operations. Areas of operations are unlikely to have inference with other communication sources due to the UA operating on an assigned frequency.

3. Design characteristics and procedures to prevent lost communication:

    a. In regards to RF interference – Careful design and integration of antennas and antenna locations are positioned to ensure minimal RF interference between different RF sources, and between different potential sources of RF interference.

    b. Pilots are trained extensively with an in depth knowledge of RF and aircraft limitation to prevent inadvertent flight beyond communication range. This requires careful flight planning with consideration for altitude and terrain masking. The flight control system also warns the pilot when the RSSI quality is below the threshold. A robust communication link capable of up to 40 miles with proper antennas is implemented on the DAx8, which is not expected to operate farther than 3 miles from home.

    c. Antenna mounting locations are carefully calculated and tested to ensure that maximum communication is obtained. Exposure to each antenna is independent of the aircraft orientation.

    d. In the event of loss of GCS communication and functionality, the UA will automatically execute a preprogramed lost communication flight plan which can include auto-return home and auto-land.

    e. Loss of UA functionality will activate flight termination which includes motor termination and deployment of the parachute, and/or aerodynamic termination if required.

    f. Atmospheric attenuation including precipitation condition may cause degradation of the communication link quality. Careful flight planning must be performed while taking into account for atmospheric conditions that may decrease operational range.

4. Pilot/Crew Qualifications/Training Reference:

1. Drone America's Flight Training Syllabus has been established to provide a progressive curriculum to maintain pilot proficiencies in accordance with CFR 14 Part 61.3, 63 and CFR 14 Part 91.3 that is in compliance with 8130.34C, Appendix A.

    Course instructors are qualified ATP with a Designated examiners (DE) endorsement, CFII, Multi-engine instructors. Instructors are qualified in UAS mission planning, flight planning and field deployment.

    a. Pilot Training:

        Each UA pilot applicant currently holding an FAA pilot certificate and fulfills Drone America's training requirements, will receive upon completion of satisfactorily passing the Practical Test Standards, a Certificate that qualifies him or her as a UA pilot.

b. Formal Pilot Curriculum:

A training curriculum has been developed that follows the Flight Training Syllabus and instructed by a licensed FAA Flight instructor to maintain proficiencies for all UA pilots.

c. Observers:

i. Pilot Certificate - Typically observers will not be required to hold a pilot certificate. However, observer applicants are required to attend and satisfactorily pass the practical test. Refer to Drone America's 3-day Observer training course on page 65. Pilots who have observer training may have to hold an observer position at times when not acting as an AVO or PIC.

ii. Medical Certificate - Observers are required to hold a Class 2 medical prior to acceptance into the Observer Training Program and to meet compliance with 8130.34C, Appendix A; and Drone America's policies.

iii. See and Avoid - Observers will be trained and familiar with Far Part 91 and tested to be in compliance with see and avoid procedures, cloud clearances and right of way rules.

iv. Training Curriculum - Observer training curriculum shall involve an overview of Drone America's policies, operations and procedures. Observer applicants shall be knowledgeable in crew duties, crew resource management and familiar with the appropriate sections of the Aeronautical Information Manual. Applicant qualifications require an individual to have 20/20 vision, speak, read and write English and demonstrate the ability of position awareness.
As referenced Observer Training is a 3 day course, in which applicants shall be trained in the following techniques to identify and avoid potential ground and airborne hazards:

v. Observer Training - As described in sub-section (iv) all observers must pass the curriculum testing to be a qualified observer.

d. Observer Knowledge and Understanding:

The observer shall be knowledgeable and have understanding in:

i. Proper communication and phraseology

ii. Proper visual scan techniques

iii. Standard flight operations at non-towered airports

iv. Containment areas and how to determine UA range within the operating area

5. Pilot Type Ratings and Medical Standards:

The chief pilot/instructor is qualified to fly DAx8 per FAR Part 61 and in accordance with 8130.34C Appendix A.

Additionally qualified pilots:

Pilot Ratings	Total Manned Hours	Total Unmanned Hours	Medical Certificate
Multi Engine, CFII, ATP, ADP	16,790	700	1st Class
Private	478	10	2nd Class
Private	51	1878	Pending
Total Time:	17,319	2583	

Pilot Certifications, Flight Experience and Medicals

6. Operations

a. UA Operational Visibility:

The DAx8 is unique and is easily identified by its enclosed eight-rotor configuration and spheroidal design and by the bright red and/or orange paint scheme on the airframe. The DAx8 is equipped with red and green LED navigation lights. In the event the anti-collision lights are inoperative the flight shall be terminated until the condition is corrected.

b. Critical system process points include:

The most critical system process is the setup of the flight configuration file for each airframe. This includes all of the data such as IMU orientation, ESC calibration, airframe weight and CG location relative to the IMU. These parameters are configured per airframe type. The autopilot configuration, including gains and all the flight parameters, can be copied to multiple vehicles with the exact same setup. In testing, it has been verified that the autopilot is robust to small changes in vehicle weight and balance, but it still needs to be quantify how large the changes need to be before it is necessary to re-tune the vehicle.

When performing the initial setup, it is necessary to know what PWM range the ESC's are calibrated to, and what PWM values correspond to min and max throttle parameters. These are entered as parameters into the Airware configuration utility. These values are not available for most off-the-shelf speed controllers; therefore, each ESC will have to be calibrated externally to the same known PWM range.

The configuration files are stored in the Airware cloud. Once created, they are stored in the data base for easy access to new or existing vehicles as information is needed or required. Version control is provided on the Airware cloud.

The Mapping Updates are derived from Terra Server Google and Bing. Map tiles are cached and geo-referenced automatically. For elevation data, we use SRTM (Shuttle Radar Topography Mission) data that can be downloaded from the USGS. All maps are updated in real time via the internet.

Engine Start Ground Procedures for the DAx8 has a built in software algorithm for motor start. The flight controller must receive a signal from the ground control station in order to turn on the motors, which is executed by the AVO. This start and takeoff command requires a secondary confirmation from the AVO before being sent to the DAx8, thus preventing any chance of an accidental start. All ground personnel are cleared and required to stand back 35 feet from the takeoff area prior to motor start.

c. Flight:

All commands during flight operations are directed and changed via the GCS software control interface in real-time.

During flight, the AVO monitors telemetry data and makes appropriate changes in altitude, speed, heading and waypoints using keyboard/touch screen inputs and/or mouse point and click commands. Additionally, the AVO can also control the UA using a stylus for point and touch to control the UA's direction.

The systems required for normal flight operations include the GCS, the ground side data link and associated antennas, the autopilot and 3D GPS, static air pressure sensor, and air data link.

Critical process points include:

- Adequate number of GPS satellites acquired to provide 3D solution
- Functional primary communication data link
- Functional autopilot Flight Core and IMU
- Current maps and weather data are loaded on the GCS

- Batteries are fully charged prior to takeoff
- Motors are inspected for proper rotation direction and correct propeller orientation is verified.
- Sensor/payload is installed correctly and securely.

The DAx8 control mode is selected by the flight mode switch on the AVO Hand Held Controller, or by selecting the flight mode in the ground station user interface. The flight control modes available depend upon the hardware installed. The following three options for flight modes are available:

1. Manual - Direct control via RC controller
2. Attitude mode - Autopilot self-levels the aircraft, while still being guided by the AVO
3. Autonomous - Fully controlled via the autopilot and uploaded waypoint set

d. Flight envelope:

Initial flight test will be done indoors within the production facility. Flight will continue indoors until authorization is approved for outdoor operations. Outdoor operations will consist of line sight not exceeding Visual Line of Sight (VLOS) and not to exceed 400' AGL.

Operations will be performed in a safe manor and in accordance with 14 CFR Part 61 and Part 91. All outdoor flights will be contained within a preplanned flight envelope that is determined by the mission commander and approved by the Flight Safety Officer.

7. OPERATING SPECIFICATIONS:

a. DAx8 operating specifications are:

Aircraft Specifications		Aircraft Performance	
Airframe Diameter	4.0 ft.	Max speed	28 mph
Height	8.0 in.	Max rate of climb	500 ft./min
Gross Weight	19.7 lbs.	Max rate of descent	1,000 ft./min
Empty Weight	8.0 lbs.	Max Service Ceiling	*3,000 ft.
Max Range (LOS)	.88 Mi	Max angle of bank	40°
		Max Payload	4.4lbs.

* Prior to flight, the AVO can set altitude limitations from the Ground Control Station to prevent the UA from exceeding specified altitudes.

b. Minimum Flight Visibility and Distance From Clouds:

Flight operations will be conducted in compliance with 14 CFR Part 91.155 Basic VFR Weather Minimums. Operations are generally 400' AGL and will be performed as stated in the Basic VFR Weather Minimum table.

c. Hazards:

Outdoor Operations will be conducted in day-light hours in VFR conditions at 400' AGL, or less and within visual line of sight. These flight parameters present a minimal meteorological hazard to the operations and will not be operated in icing conditions.

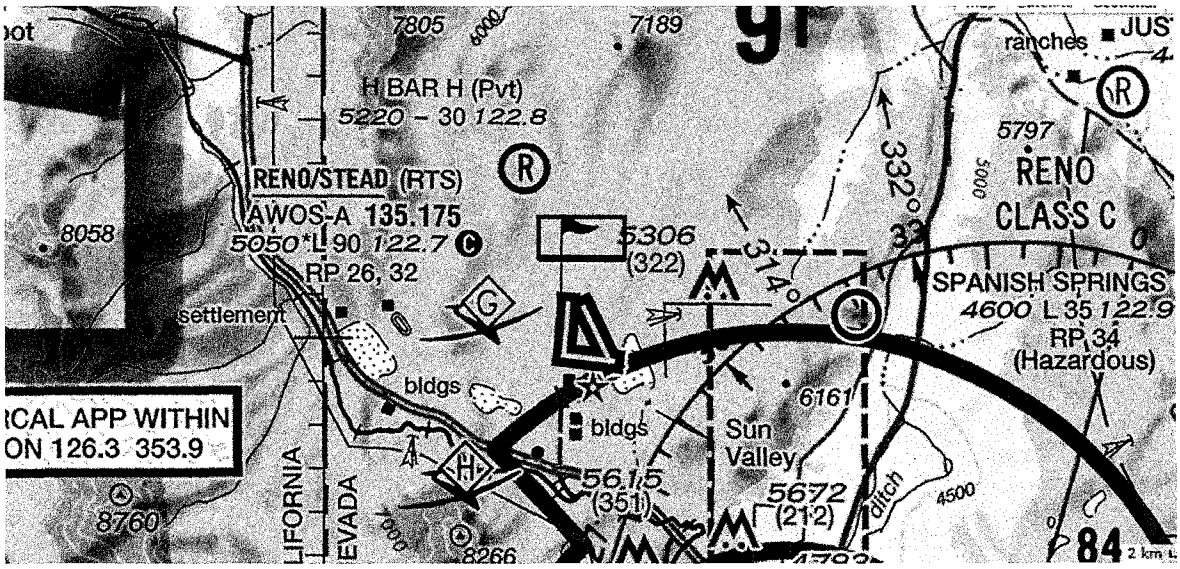
d. Safety Mitigations:

Prior to flight, it is the responsibility of the AVO, Mission Commander and the Flight Safety Officer to verify and monitor current and forecasted weather conditions. In the event the weather deteriorates, the flight will be terminated until adequate VFR conditions can be met per 14 CFR Part 91.155.

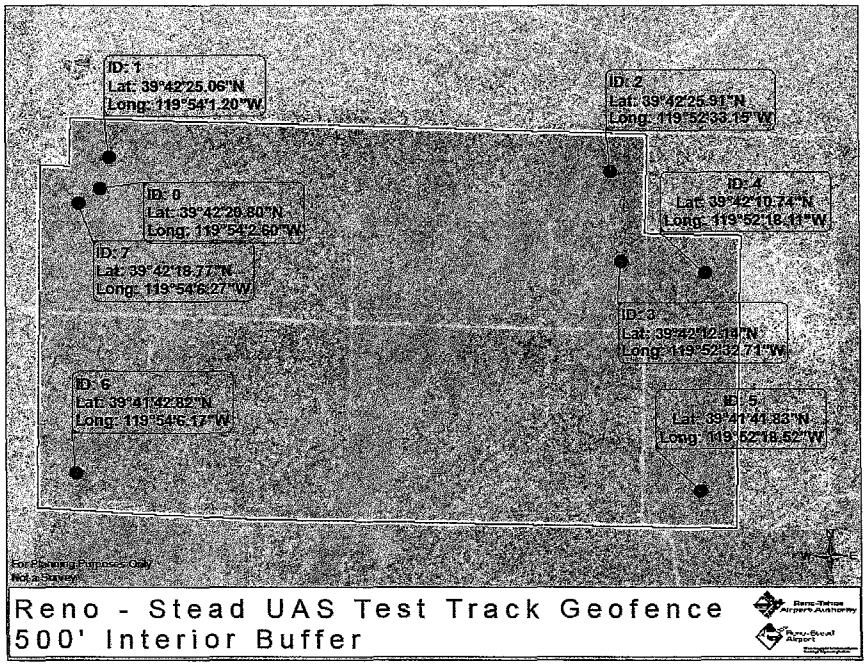
Airspace	Flight visibility	Distance from clouds
Class A	Not Applicable	Not Applicable.
Class B	3 statute miles	Clear of Clouds.
Class C	3 statute miles	500 feet below. 1,000 feet above. 2,000 feet horizontal.
Class D	3 statute miles	500 feet below. 1,000 feet above. 2,000 feet horizontal.
Class E:		
Less than 10,000 feet MSL	3 statute miles	500 feet below. 1,000 feet above. 2,000 feet horizontal
At or above 10,000 feet MSL	Not Applicable	Not Applicable
Class G:		
1,200 feet or less above the surface (regardless of MSL altitude)		
Day, except as provided in §91.155(b)	1 statute mile	Clear of clouds.
Night, except as provided in §91.155(b)	Not Applicable	Not Applicable.
More than 1,200 feet above the surface but less than 10,000 feet MSL	Not Applicable	Not Applicable

8. OPERATIONS AREA:

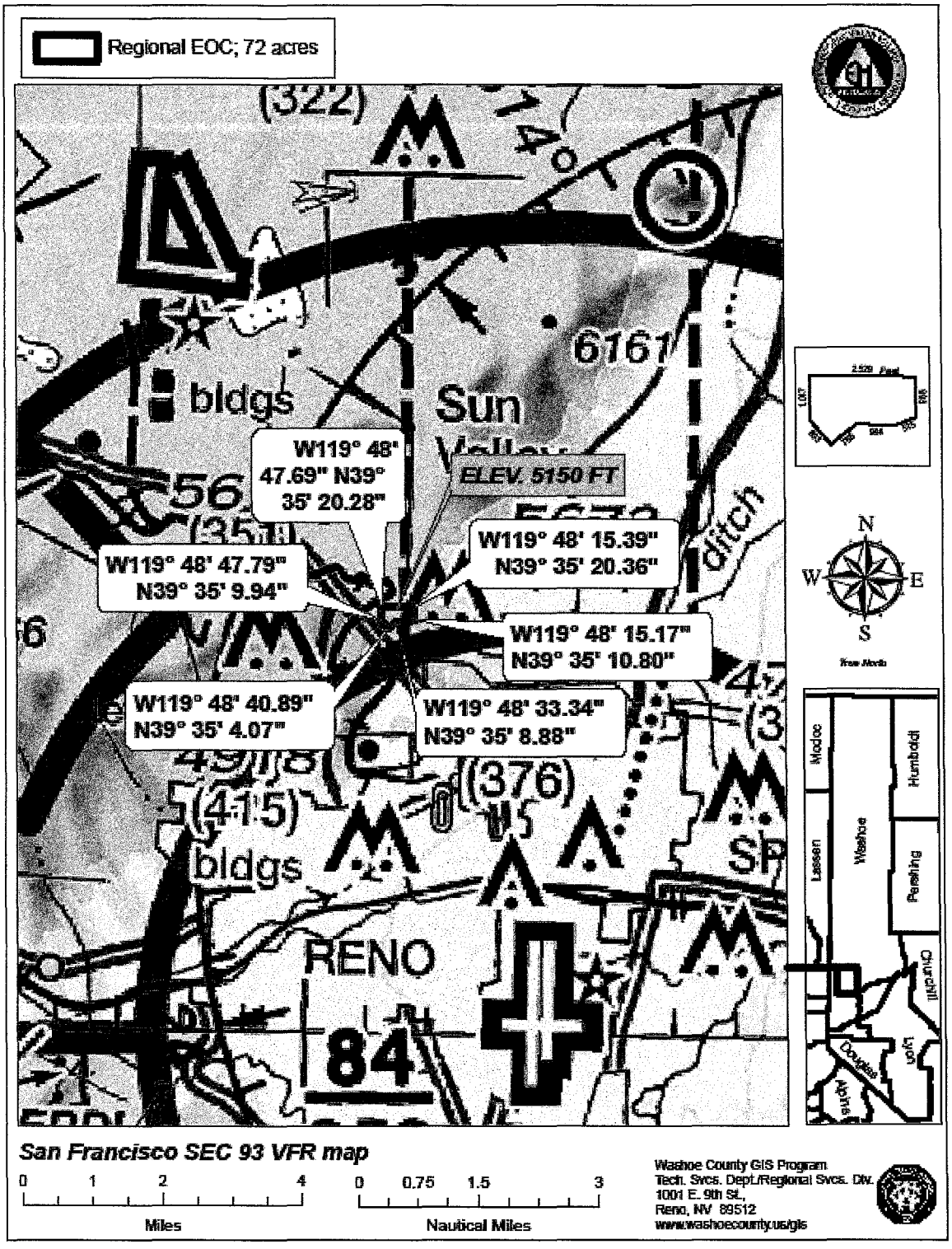
The areas of operations are within Washoe County and the FAA approved Reno-Stead Airport UAS Test Site. Each of these areas range from rural unpopulated desert to sparely populated areas to demonstrate emergency service proof of concept. Each area is unique in that it provides different types of research and development, as well as, implementation of training various first responder teams in UA systems. The criteria for each area provides specific field training relative to local emergencies and disaster relief mitigation. The following areas are depicted in red boxes on the following charts:



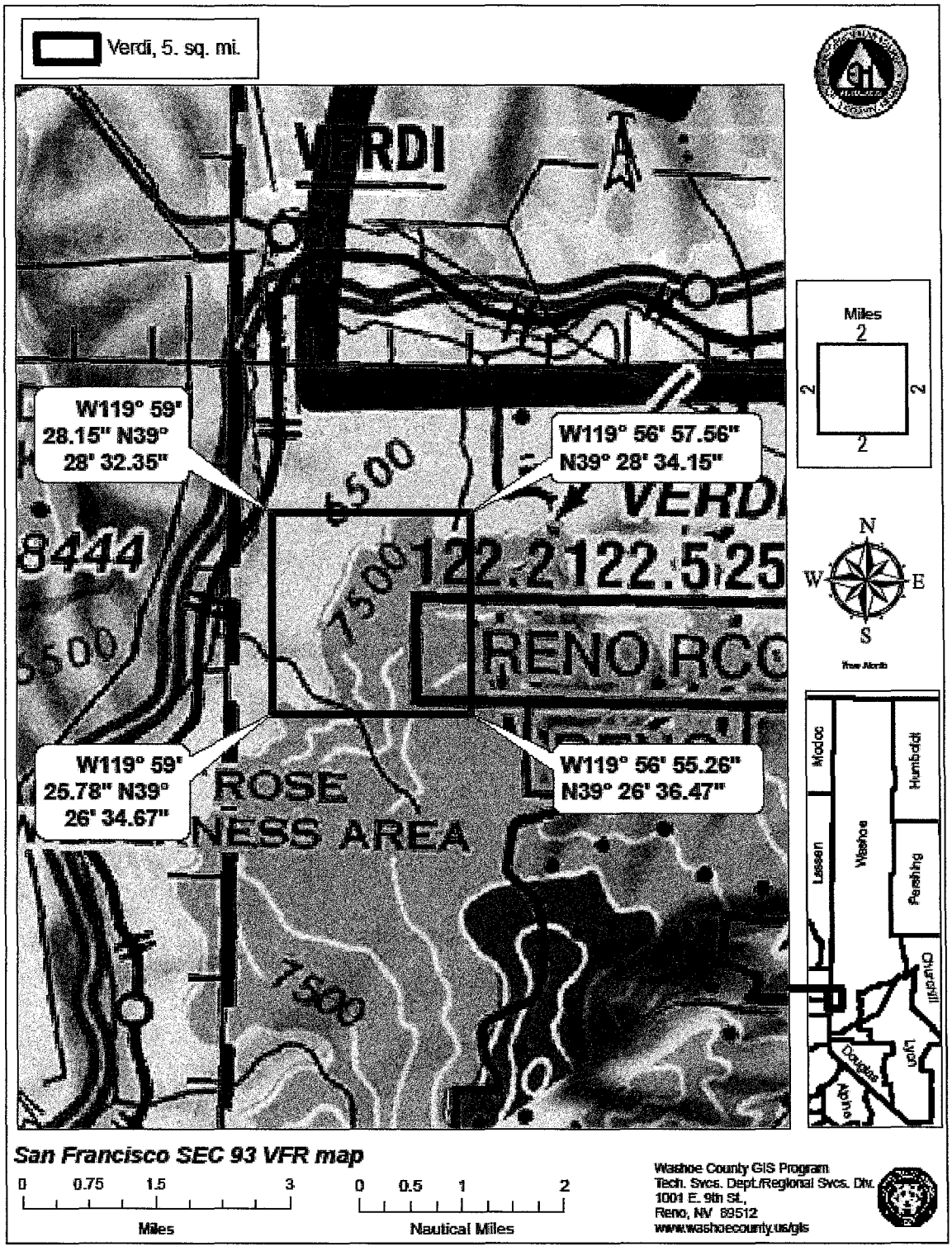
Reno-Stead Airport (UAS Nevada Test Site)



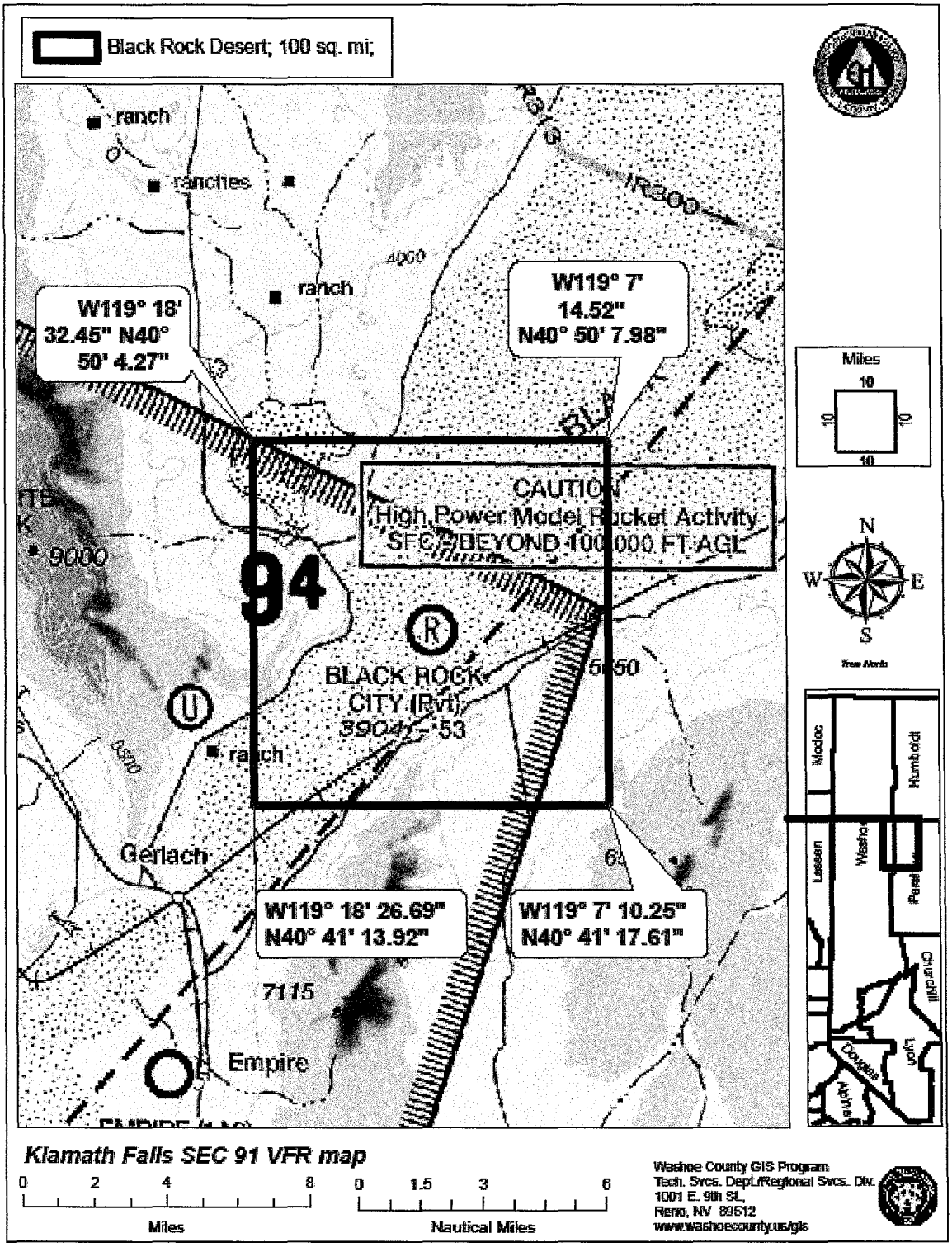
Reno-Stead Airport Coordinates



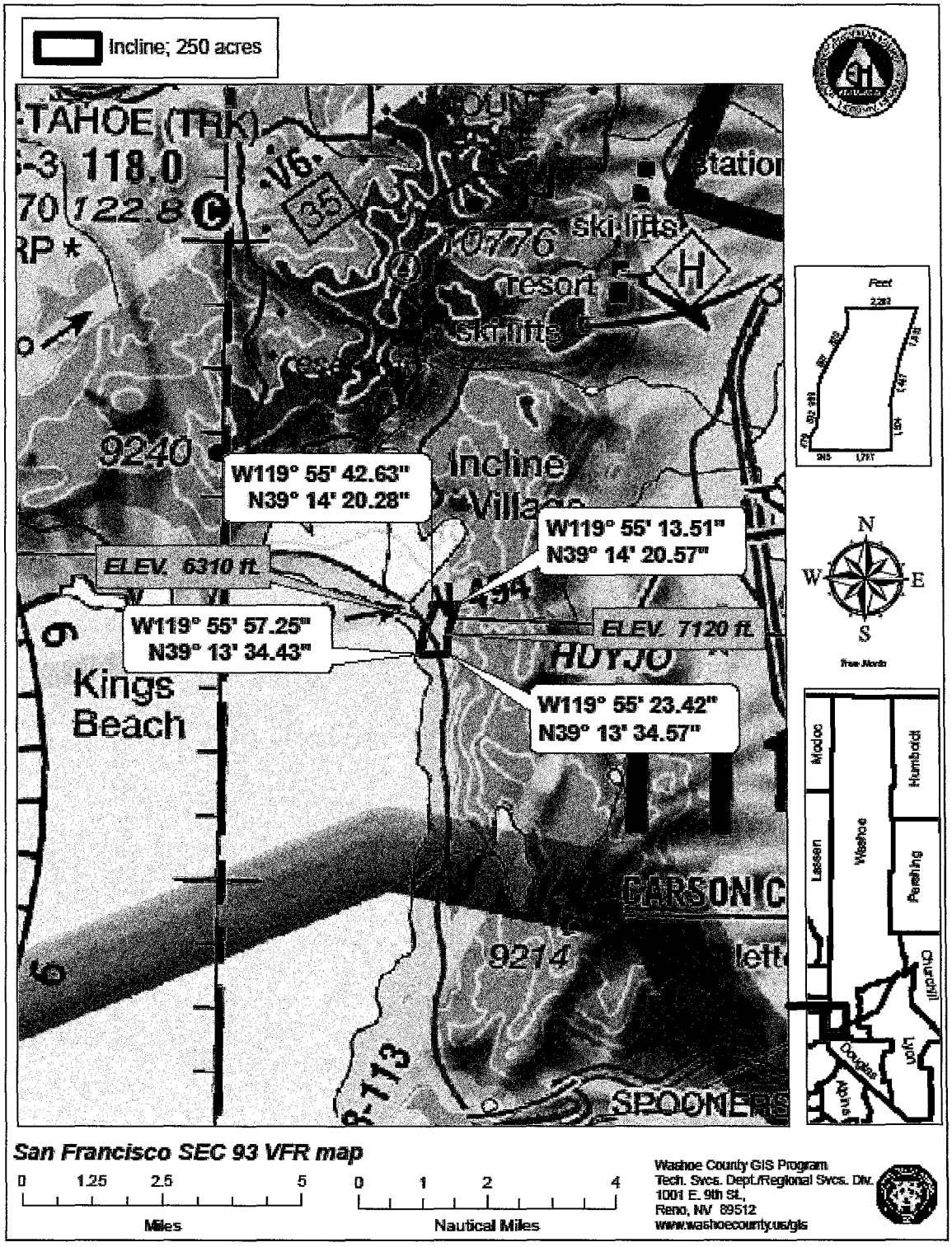
Washoe County Emergency Operations Center and Homeland Security Training facility



Verdi Mountain Training Center



Washoe County Desert Training Center



Washoe County Urban Training Center
(Mock buildings for Fire Crew Training Center)

A. OPERATIONS AREA DESCRIPTION:

1. **Reno/Stead Airport** – The Reno-Stead Airport has been designated by the FAA as a UAS test site range. As proposed, the initial outdoor flight testing is to be performed in Class G airspace within an FAA designated test area at Reno/Stead Airport. The test facility area is 812 acres 2.2 miles north of the main active runways 8/26. Runways 14/32 does have the capability to be closed by the airport authority during flight test operations. The airport authority will post an AWOS and a NOTAM notice broadcasting the date and times of Unmanned Aircraft testing and air operations for the Reno/Stead Airport. The Reno/Stead Airport is secured by perimeter fencing and therefore, restricts unauthorized activities of public access and/or events. The test area is in a remote location 1.8 miles northeast of a housing subdivision.

2. **Washoe County Emergency Operations Center and Homeland Security Training facility** – The regional Emergency Operations Center (EOC) is a 72 acre training facility that provides disaster training for HAZMAT and environmental containment, and natural disaster remediation. The operation area is located 5 ½ miles northwest of the Reno/Tahoe International Airport under Class C airspace. The Class C airspace extends from 7,200' MSL to 8,400' MSL. Whereas, flight operations within the EOC facility will not exceed 5,550' MSL, it is contained within a small canyon. This facility is ½ mile from a sparely populated area and does not pose a flight risk or noise nuisance to surrounding structures due to the speed and weight of the UA.

3. **Verdi Mountain Training Center** – Is located in the Mount Rose Wilderness Area at an elevation of 7,500' MSL. This operation area is 5 square miles with no structures or population within 6 miles of a population center. The purpose for this location provides UAS search and rescue training and implementation.

4. **Washoe County Desert Training Center** – This location is an isolated part of Northern Nevada in Washoe County. The operations area is 10 miles square and 10 miles from the nearest establishment. Operations will be conducted from Black Rock Airport (3,904' MSL), which is a private airstrip that has no structures in the middle of the Black Rock Playa. The purpose of location is to provide UAS emergency service training to law enforcement in the Northern Nevada and medical relief exercises. The operations area underlies the Reno Military Operation Area (MOA). The Reno MOA's floor is 13,000' MSL. Emergency operations training will not exceed 4,500' MSL and will be conducted in day light hours under VFR conditions. De-confliction of the airspace does not present a problem since the DAx8 power supply will be depleted prior to UA reaching altitudes of 13,000'; therefore this alleviates potential cause of hazardous situations.

5. **Washoe County Urban Training Center** – Is an area that will demonstrate UAS capabilities in and around vacant structures. Emergency services will train with several environmental sensors to detect air quality, IR and heat imagery sensors to assess safe conditions prior to entering a structure. The area is sparely populated and does not pose a hazard to persons or air traffic. Operations are low level flight around the vacant structures for emergency training and urban assessment.

9. AIRPORT OPERATIONS:

Airport operations have been described in Section 8 under Operations Area Reno/Stead Airport and Washoe County Desert Training Center. The airports selected for operations have been either deemed as a UAS test site and Black Rock City Airport is a private field in which authorization has been sought and approved for UAS emergency training exercises. Black Rock City Airport is just a dirt strip runway and does not have any structures or aircraft parked on the ramp. All safety mitigations have been taken into consideration, including radio communications and lost link procedures.

10. VISUAL LINE OF SIGHT (VLOS):

The DAx8 will remain within visual line of sight (VLOS) by the use of observers. Through two-way communications with the operator, observes shall provide critical information pertaining to flight safety, obstructions and airspace encroachment. Observers will also clear the area of people to keep a safe perimeter of operations.

11. DAX8 PREFLIGHT:

i. The preflight process of Drone America's DAx8 consists of:

- Preflight check of the DAx8
- Preflight check of the Portable Ground Control Station (GCS)

All preflight processes for the UA and portable GCS, as well as all other flight critical equipment requires the use of checklists.

The technicians are responsible for performing the preflight inspection of the UA, which will include checking of all eight electric motors, the battery system, electrical systems and physical inspection of the airframe. The technicians will recharge the batteries and assure that backup batteries are available and ready for replacement. All defects and repairs are noted in the UA maintenance logbook and signed off by the certified technician.

The technicians shall also perform weight and balance checks for the UA at empty weight and takeoff weight to ensure proper center of gravity calculation for each UA payload configuration.

Upon receiving the UA from the crew chief, the AVO will review the UA logbook and sign off to receive all maintenance items and the weight and balance, as well as reviewing the airframe, electric motors and autopilot total flight time. The AVO will then perform a final walk-around to visually inspect the UA, and remove any safety pins/flags from the UA in preparation for flight.

The AVO shall also perform the preflight of the portable GCS using associated checklists to ensure the GCS is programmed for flight. This preflight process consists of procedural inspections of the ground data terminal (GDT), antennas and cabling and all electrical connectors.

GCS preflight includes system power up of the Tough Pad screens, and verify payload control and communication panel.

The AVO shall perform communication checks for all radio equipment, as well as, crew radio squawk checks. The AVO must cycle the speed controller throttle and respective autopilot flight controls to verify control accuracy and operations of Tough Pad systems.

As part of the GCS preflight, the ground station software and the UA software are updated to the latest version approved for flight operations.

ii. System criteria require system preparation for flight that includes software, electrical systems, control systems and electric motors. Each system is required to be checked and tested prior to every mission during the preflight operation. As part of the startup checklist, the AVO will verify that the GCS and autopilot software are updated to the correct and approved version.

Preflight of electrical systems includes:

- Aircraft batteries are fully charged
- Verify the onboard power management units (PMU) are powered up and regulated to the correct voltage – 14.8V
- Ensure power is on and connected to the portable GCS main and USB transmitter/receiver
- Check backup batteries are charged/charging
- The inverters are turned on and have correct voltage output

Control systems preflight includes:

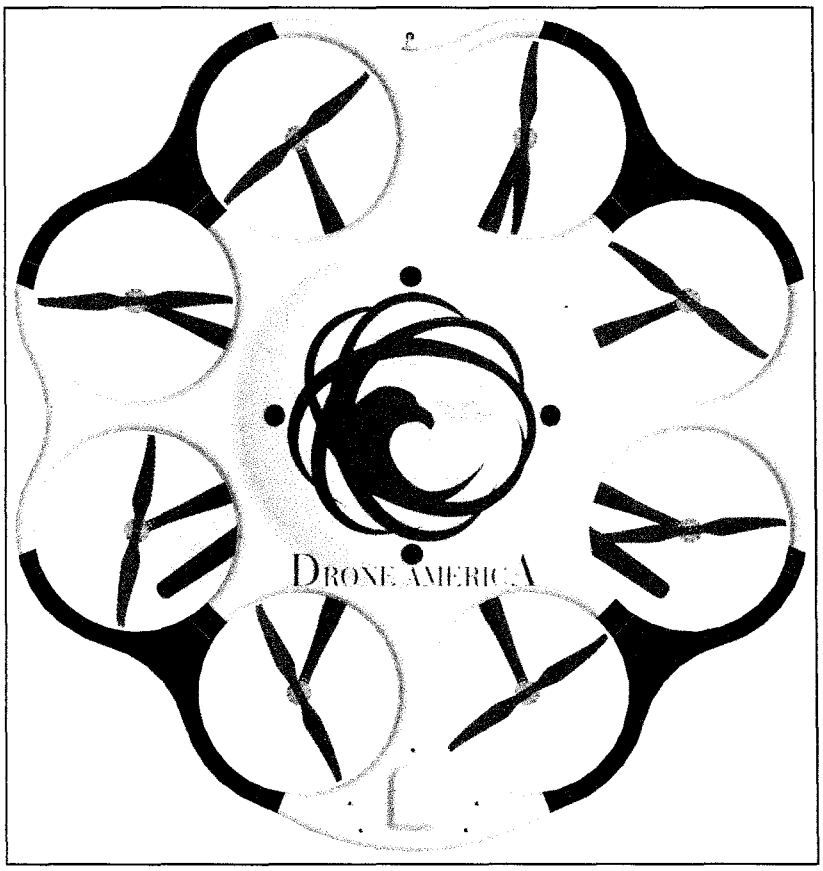
- AVO verifies flight autopilot and speed controls are operational
- Verification of throttle control is responsive
- The AVO will also perform an Inertial Navigation System (INS) check to verify that pitch, yaw and roll gyros/accelerometers are oriented correctly
- Verify electric motors are functioning normally
- Verify electric motors are responsive in correlation with the portable GCS interface

Preflight Safety Check/Walk-Around Inspection:

Preflight Safety Checklist shall be performed by trained ground personnel to inspect the UAS prior to each flight utilizing the checklist referenced below.

iii. Walk-Around Inspection:

1. Inspect all 8 motors for security	2. Inspect all 8 Propellers for cracks, chips and delamination's and screws for security
3. Inspect all 8 motor arms for security	4. LED Navigation Light Inspection
5. Fuselage Inspection for abrasions, cracking or delamination's	6. Antenna Inspections: GPS, Transponder/Receiver
7. Lower hatch secure	8. Camera Inspection and Cleaning



DAx8 Top View

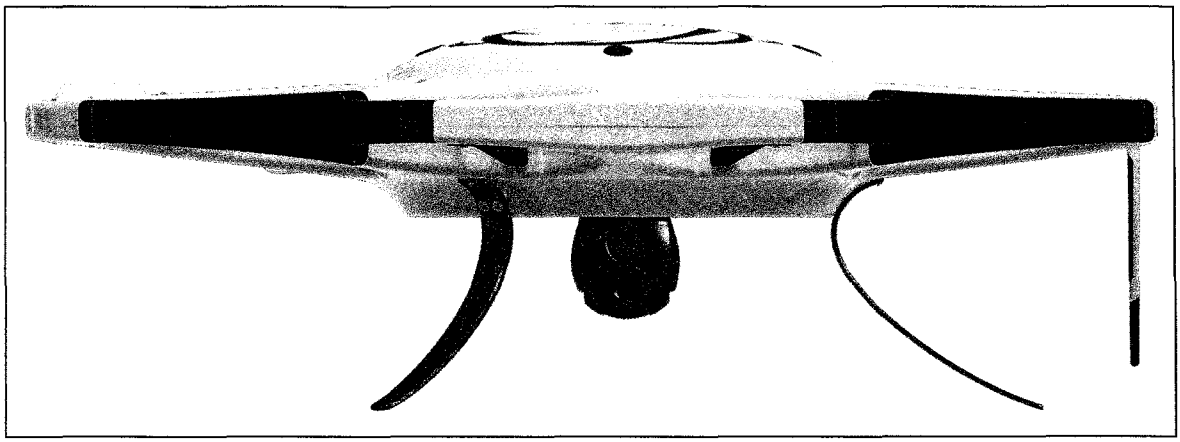


ILLUSTRATION 2 – DAX8 SIDE VIEW

iv. Preflight Checklist:

Electric Motor Preflight Safety Checklist			
Flight Operation:		Preflight Tech:	Date:
			Tech Int./Stamp
1.	Verify system is off		
2.	Verify motors are secure (Check by twisting, pushing/pulling)		
3.	Verify speed controllers cables are connected to the bus bar for all 8 motors		
4.	Inspect all wires for cuts or abrasions		
5.	Inspect propellers for nicks or cracks		
6.	Inspect motors for smoothness of operation and cleanliness		

ELECTRIC MOTOR PREFLIGHT SAFETY CHECKLIST

Battery System Preflight Checklist:

Battery System Preflight Checklist		
Flight Operation:	Date:	
Aircraft S/N:		Tech Int./Stamp
1.	Verify proper batteries are installed **(USE ONLY MANUFACTURER RECOMMENDED BATTERIES)**	
2.	Verify batteries are secure	
3.	Verify batteries are charged	
4.	Verify backup batteries are charged and on standby	

BATTERY PREFLIGHT CHECKLIST

Avionics Preflight Checklist:

Avionics Safety Checklist		
Flight Operation:	Date:	
Aircraft S/N:		Tech Int./Stamp
1.	Inspect avionics compartment for debris	
2.	Inspect bus harness connections	
3.	Verify avionics are secure and properly mounted	
4.	Verify analog connectors are connected and inspect for damage	
5.	Verify power cable is connected and inspect for damage	
6.	Inspect GPS antenna and verify connection	

AVIONICS SAFETY CHECKLIST

Airframe Preflight Checklist:

Airframe Preflight Checklist				
Aircraft S/N:		N-Number:	Date:	Tech Int./Stamp
1.	Verify fuselage serial number			
2.	Turn power ON			
3.	Inspect fuselage for defects			
4.	Inspect navigation lights			
6.	Inspect transponder/transponder antenna and verify connection (if installed)			
7.	Inspect sensor/payload for damage			
8.	Remove camera cover and clean lenses			

AIRFRAME PREFLIGHT CHECKLIST

v. Center of Gravity Preflight Checklist:

Due to the configuration of the DAx8, CG is fixed within a small range in the center of its circular perimeter. Weight is the only driving factor in stability. The DAx8 is designed to fly at a max weight not to exceed 85% of its maximum thrust. The thrust output for the DAx8 is expected to be a maximum of 13.5kg, or 29.75lbs at sea level. This yields a maximum possible takeoff weight of roughly 25 lbs. Depending upon the location and base elevation this weight will decrease. It is up to the AVO to calculate the approximate density altitude and determine the maximum takeoff weight for a given situation based upon weather and location. These statistics are subject to change during testing, and upon completion of flight trials, a detailed weight table will be presented as a guideline for safe operations.

Weight and Balance Sheet			
Aircraft S/N:	N-Number:	Model#:	Date:
Prepared by:			
Max weight:	Empty weight:		
COMPONENTS:	WEIGHT/LBS.		
Payload			
Aux. Payloads			
USEFUL LOAD REMAINING			

WEIGHT AND BALANCE SHEET

12. PURPOSE FOR UAS EXEMPTION:

The purpose for exemption is to enhance the situational awareness capabilities of emergency service agencies and first responders by employing unmanned aircraft systems (UAS), with high-resolution sensing and imaging capabilities for disaster remediation. Emergency service agencies and first responders face significant challenges during an emergency event such as, a natural or anthropogenic disaster (earthquake, tsunami, fire, hurricane, tornado, floods, power or nuclear accident, act of war, or terror). One of the major challenges is acting decisively based on available information with consideration of human factors. In addition to, providing high-quality real-time situational awareness that is critical to effectively manage and safeguard civilians and field personnel. This project focuses on creating a smart emergency-response service system utilizing UA and ground-based systems. These systems are equipped with state of the art imaging, sensing and communications to provide first responders with high-quality, real time information to act decisively and effectively via human machine interactions.

The objectives include:

(1) Develop and integrate UAS platforms, sensors, imaging, communication systems and control and path planning algorithms to create a UAS based smart service system for first response.

(2) Model the state of human and structural infrastructure during and/or post a disaster that identifies the scene, and creates mapping access paths to safety.

(3) Test prototypes and pursue commercialization opportunities.

(4) Educate the public and train first responders on the technology.

13. CERTIFICATE OF AUTHORIZATION – COA:

A certificate of Authorization is currently pending approval through the Reno Regional Emergency Operations Center. The COA identifies Platform, Performance and Procedures, in which are identified within this request for relief of exemption.

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