



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
US ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND
AVIATION AND MISSILE RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER
5400 FOWLER RD
REDSTONE ARSENAL, AL 35898-5000

AMSRD-AMR-AE-B-U

18 Sep 06

MEMORANDUM FOR Ground Maneuver Project Manager's Office (SFAE-AV-UAS),
Redstone Arsenal, AL 35898-5000

SUBJECT: Airworthiness Release (AWR) for Operation of RQ-7B Shadow Unmanned
Aircraft System (UAS), (TN 33710), (AWR RQ-7B20060909)

1. Scope: This memorandum constitutes an Airworthiness Release Qualification Level 3 authorizing operation of the RQ-7B Shadow Unmanned Aircraft System within active restricted airspace and within the Federal Aviation Authority (FAA) approved Certificate of Authorization (COA) area at Ft. Indiantown Gap, Annville, PA.
2. Validity: This AWR is new and terminates upon changes in configuration of the subject equipment or upon issuance of a later AWR, whichever occurs first. This AWR is valid only for operations within active restricted airspace and within the Federal Aviation Authority (FAA) approved Certificate of Authorization (COA) area at Ft. Indiantown Gap, Annville, PA.
3. Appendices: This memorandum shall be carried in the logbook and kept in the aircraft historical record file 3.

Appendix A Restrictions and Operating Information
Appendix B Configuration and Installation Detail
Appendix C Inspections, Maintenance, and Logbook Instructions
Appendix D Reference List

4. The point of contact (POC) is (b) (6) commercial (256) 895-3403, FAX (256) 895-4141, or E-mail: (b) (6) @us.army.mil.

(b) (6)

for

Director of Aviation Engineering

SUBJECT: Airworthiness Release (AWR) Qualification Level III for Operation RQ-7B Shadow Unmanned Aircraft System (UAS), (TN 33710), (AWR RQ-7B20060909)

Appendix A Restrictions and Operating Information:

WARNING

The RQ-7B Shadow UAS has not completed full airworthiness qualification. All flight operations shall be conducted in a manner to minimize exposure to manned aircraft and populated ground areas.

WARNING

Accidental operation of the RQ-7B Shadow UAS outside of restricted Airspace and/or the approved COA shall be immediately reported to ATC. The Operator shall take immediate actions to correct the flight path and/or follow ATC direction.

WARNING

The RQ-7B Shadow UAS has not undergone complete Electromagnetic Interference/Electromagnetic Compatibility (EMI/EMC) testing. Flight into high intensity EMI areas may result in loss of control of aircraft. Operators shall avoid known high intensity EMI areas.

WARNING

The RQ-7B Shadow UAS has not undergone SOF Explosive Atmosphere Testing, a serious fire or explosion may result if the aircraft is powered in the presence of flammable vapors during ground or flight operations. The precautions in paragraph 3 of this Appendix A shall be observed in order to ensure safe flight.

WARNING

The RQ-7B Shadow UAS does not have a sense and avoid system. Mid-air collision is a risk. All flight operations shall be conducted to ensure that manned and unmanned aircraft shall not occupy the same airspace.

WARNING

The RQ-7B Shadow UAS will rely on ground observers and/or chase aircraft to provide airspace de-confliction. In either case the observers shall remain within 1 mile laterally and less than 3000 feet vertically of the AV. If radio contact is lost between the ground observers/chase plane observers and the Ground Control Station (GCS) operator, the GCS operator shall return the AV to lost link waypoint and loiter until communications have been re-established.

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CAUTION

The RQ-7B Shadow UAS (to include GCS and supporting subsystems) has not been tested for lightning. Flight operations shall be halted if lightning activity is within 25 nautical miles.

1. The aircraft operating instructions, procedures, and limitations shall be in accordance with the references 1, 2, 3 and 4 and this AWR. In the event of conflict between these documents, the information in this AWR shall prevail.
2. Flight of the RQ-7B Shadow is restricted to Visual Meteorological Conditions (VMC).
3. Due to lack of SOF Explosive Atmosphere testing, the following precautions shall be observed in order to ensure safe flight:
 - a. The aircraft shall be un-powered and properly grounded during refueling operations IAW references 1.
 - b. While on the ground the aircraft shall maintain the greatest distance practical from all other aircraft and fuel depots, while achieving mission objectives.
4. Data link frequencies shall be de-conflicted through local frequency controller.
5. The Flight Termination System (FTS) site shall be inside proposed active restricted airspace over an approved impact area.
6. In the event of a catastrophic failure, ATC will be notified immediately and the aircraft will be ditched over FTS site in active restricted airspace if possible. If not possible to make the FTS site, every effort shall be made to visually inspect the probable impact area with the payload prior to parachute deployment.
7. Mission profiles shall be planned to minimize flight operations that are outside of the 4:1 glide ratio to the FTS site. If mission planning identifies flight outside of the 4:1 glide slope, additional FTS sites shall be identified, planned and briefed during the Mission Briefing.
8. Ground observers and/or chase aircraft shall maintain positive visual contact with the aircraft at all times in accordance with the approved COA.
9. In case of loss of communications between the aircraft operator and Muir Army Airfield ATC, the aircraft shall be directed to the FTS/RTB waypoint or as directed in the approved COA.
10. Flight over populated areas outside of restricted airspace is prohibited.

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11. The aircraft shall not be flown at altitudes below 2000 feet Above Ground Level (AGL) except for launch and recovery activities.
12. All UAS flight operations, to include planned flight profiles, shall be coordinated with ATC to ensure that the RQ-7B Shadow UAS, manned fixed wing, and manned rotary wing aircraft traffic pattern altitudes are separated by a minimum of 1000 feet.
13. During preflight someone other than the operator shall verify that the return home waypoint is entered correctly.
14. If a non-cooperative aircraft enters airspace while occupied by the RQ-7B Shadow UAS, Muir Army Airfield ATC, UAS operator and/or ground observers will direct RQ-7B Shadow back to active restricted airspace using the approved corridor.
15. Muir Army Airfield ATC shall be briefed before each flight with expected mission duration to aid in deconfliction.
16. Verified, complete and non-recoverable loss of any AV or Ground Control Station (GCS) flight critical sub-system shall require return to FTS/RTB site. Degraded flight is not authorized.
17. If power is lost to ground station, the aircraft shall return to FTS/lost link site while control station is being reset.
18. Any unexplained anomaly shall initiate return to FTS/lost link site. Trouble shooting may be performed if within the restricted airspace to correct anomalies before decision to return FTS/RTB.
19. There shall be a minimum of one controlling GCS and one back-up GCS for all flight operations.
20. Any Procedural deficiencies or flight anomalies detected during operations shall be corrected, annotated, and reported to the POC listed in paragraph 4 of this AWR prior to proceeding to the next flight.
21. Commander's Corner:
 - a. The RQ-7B Shadow Unmanned Aircraft System (UAS) has not completed the airworthiness qualification process. An AWR has been granted through a Level 3 Airworthiness evaluation. A Level 3 AWR establishes a minimum level of safety for UAS operations. Strict adherence to the Operator's Manual and this AWR is required to reduce the risk of loss of the aircraft, property damage and personal injury.

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- b. All flight operations should be conducted to avoid populated areas.
- c. Coordination of frequencies with other systems operating in the area is critical to reducing accident rates.

Appendix B Configuration and Installation Detail:

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Configuration - This aircraft is a production configuration RQ-7B Shadow UAS as identified in references 1, 2, 3 and 4.

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Appendix C Inspections, Maintenance, and Logbook Instructions:

1. In the event any operating limit, or limits established by this release, is exceeded in addition to the normal entry on DA Form 2408-13, appropriate inspections shall be performed prior to next flight.

2. Aircraft Logbook Entries:

In accordance with Department of the Army (DA) Pamphlet 738-751, the following entries shall be made on the DA Form 2408-13-1 and shall be perpetrated on each form during the period of installation, until superseded by another AWR, or until reason for limitation is removed.

a. Place a circled "X" on the form IAW DA Pamphlet 738-751. In the Fault Information Block, make the following entry: "Operate within limitations and restrictions specified in the enclosed airworthiness release dated 9 SEP 2006."

b. A weight and balance form DD365 shall be maintained on file in each aircraft's log book and weight and balance book maintained by the operational unit.

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Appendix D Reference List:

1. Technical Manual 9-5895-YYY-10, Technical Operators Manual for Shadow 200 TUAV System with RQ-7B Air Vehicles, dated 22 October 2004.
2. Technical Manual 9-5895-YYY-20, Maintenance Manual Organizational and Direct Support for Shadow 200 TUAV System, dated 22 October 2004.
3. Technical Manual 9-5895-YYY-CL, Shadow 200 Operator's and Crewmember's Checklist, dated 22 October 2004.
4. Technical Manual 9-5895-YYY-CL, Unit, Direct Support General Support Maintenance Repair Parts and Special Tools List, dated 22 October 2004.