



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-V

17 April 2007

MEMORANDUM FOR Project Manager, Unmanned Aircraft Systems (SF AE-AV-UAS),  
Redstone Arsenal, AL 35898-5000

SUBJECT: Airworthiness Release (AWR) for Operation of RQ-7B Shadow Unmanned  
Aircraft System (UAS) (AWR RQ-7B20070417) (TN 43593)

1. Scope: This memorandum constitutes Airworthiness Release Qualification Level 3 authorizing operation of the RQ-7B Shadow Unmanned Aircraft System within active restricted airspace (R-4301) and the Federal Aviation Authority (FAA) approved Certificate of Authorization (COA) area at Ray S. Miller AAF, Camp Ripley, MN.
2. Validity: This AWR is new and terminates 2 years after issue, 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 (R-4301) and the FAA approved COA areas within at Ray S. Miller AAF, Camp Ripley, MN.
3. Appendices: This memorandum and appendix A shall be carried in the logbook, Controlling Ground Control Station (GCS) and a complete AWR copy with all appendices kept in the aircraft historical record file.

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) 313-5375, or e-mail:  
(b) (6) @us.army.mil, or (b) (6) commercial (256) 313-5420, or e-mail:  
(b) (6) @us.army.mil.

(b) (6)

Director of Aviation Engineering



SUBJECT: Airworthiness Release (AWR) for Operation of RQ-7B Shadow Unmanned Aircraft System (UAS) (AWR RQ-7B20070417) (TN 43593)

## **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 active restricted airspace and/or the Federal Aviation Authority (FAA) approved Certificate of Authorization (COA) shall be immediately reported to ATC. The operator shall make 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 erroneous data reports and/or loss of control of aircraft. Operators shall avoid known high intensity EMI areas.

### **WARNING**

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

### **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**

When RQ-7B Shadow UAS operations rely on ground observers/chase aircraft to provide airspace de-confliction, radio contact between the ground observer/chase aircraft and the aircraft operator must be maintained. If radio contact between the ground observers/chase aircraft and the aircraft operator is lost, the AV shall return to the return home waypoint and loiter until communications are re-established.

SUBJECT: Airworthiness Release (AWR) for Operation of RQ-7B Shadow  
Unmanned Aircraft System (UAS) (AWR RQ-7B20070417) (TN 43593)

### **CAUTION**

The RQ-7B Shadow UAS has not been tested for the effects of lightning (to include GCS and supporting subsystems). Flight operations shall be restricted to no less than 25 nautical miles from lightning activity.

1. The aircraft operating instructions, procedures, and limitations shall be in accordance with references D-1, D-2, D-3 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 UAS 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 grounded IAW reference D-1, D-2 and D-3 during refueling operations.
  - b. While on the ground the aircraft shall maintain the greatest distance practical from all other aircraft and fuel depots, while achieving mission objectives. The minimum distance allowed shall never be less than 50 feet.
4. Data link frequencies shall be de-conflicted through local frequency manager/coordinator before any operations.
5. The return home waypoint shall be inside active restricted airspace over an approved ditch point.
6. In the event of an engine failure or other catastrophic failure, local ATC authority will be notified immediately and the aircraft shall be ditched over the return home waypoint in active restricted airspace if possible. If not possible to make the return home waypoint, every effort shall be made to visually inspect the probable impact area with the payload prior to parachute deployment.
7. Mission profiles should be planned to minimize flight operations that are outside of the 4:1 glide ratio to the ditch point. If mission planning identifies operations outside the 4:1 glide slope, additional ditch points shall be identified, planned and briefed during the Mission Briefing.
8. Ground observers/chase aircraft shall maintain positive contact with the aircraft at all times in accordance with the approved COA.

SUBJECT: Airworthiness Release (AWR) for Operation of RQ-7B Shadow Unmanned Aircraft System (UAS) (AWR RQ-7B20070417) (TN 43593)

9. In case of loss of communications between the aircraft operator and local ATC authority, the aircraft shall be directed to the return home waypoint or as directed in the approved COA.
10. Flight over populated areas inside active restricted airspace shall be avoided
11. Flight over areas populated outside of active restricted airspace is prohibited.
12. The aircraft shall not be flown at altitudes below 2000 feet Above Ground Level (AGL) except for launch and recovery activities.
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 the COA airspace while occupied by the RQ-7B Shadow UAS, the air vehicle operator shall contact ATC and follow their instructions. If required, ground observers and/or the chase plane shall direct the Shadow back to active restricted airspace using the approved corridor.
15. Local ATC authority shall be briefed before each flight with expected mission duration to aid in de-confliction.
16. Verified loss of any aircraft subsystem or Ground Control Station (GCS) flight critical sub-system shall require RTB.
17. Any unexplained anomaly shall initiate RTB or trouble shooting may be performed within the active restricted airspace.
18. There shall be a minimum of one controlling GCS and one back-up GCS or PGCS for all flight operations.
19. 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.
20. Commander's Corner:

The RQ-7B Shadow Unmanned Aircraft System (UAS) has not completed full airworthiness qualification testing. Strict adherence to the Operators Manual and this AWR will minimize the hazards of operation.

SUBJECT: Airworthiness Release (AWR) for Operation of RQ-7B Shadow  
Unmanned Aircraft System (UAS) (AWR RQ-7B20070417) (TN 43593)

**Appendix B Configuration and Installation Detail:**

Configuration-This aircraft is a production configuration as identified in references D-1, D-2 and D-3. Any deviation to production configuration shall be approved in writing by the Aviation Engineering Directorate (POC in cover memorandum paragraph 4) for this AWR to be valid.

SUBJECT: Airworthiness Release (AWR) for Operation of RQ-7B Shadow  
Unmanned Aircraft System (UAS) (AWR RQ-7B20070417) (TN 43593)

**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 17 APR 2007."

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.

SUBJECT: Airworthiness Release (AWR) for Operation of RQ-7B Shadow Unmanned Aircraft System (UAS) (AWR RQ-7B20070417) (TN 43593)

**Appendix D Reference List:**

1. Technical Manual 9-5895-XXX-10, Technical Operator's Manual for Shadow 200 TUAV System, dated 27 August 2004, with latest updates.
2. Technical Manual 9-5895-YYY-10, Technical Operator's Manual for Shadow 200 TUAV System, dated 22 October 2004, with latest updates.
3. Technical Manual 9-5895-681-10, Technical Operator's and Crewmember's Checklist for Army Unmanned Aircraft System, Tactical Unmanned Air Vehicle Shadow 200, dated 28 February 2006, with latest updates.