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US ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND
AVIATION AND MISSILE RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER
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RDMR-AEV

18 June 2010

AWR BUSTER20100618

MEMORANDUM FOR Night Vision and Electronics Sensors Directorate, (NVESD)
(b) (6) Project Manager, BUSTER UAV Operations, Fort Belvoir, VA
22060-5806

SUBJECT: Airworthiness Release (AWR) for Operation of BUSTER 1-1001
Unmanned Aircraft System (UAS), (AWR BUSTER20100618) (TN 84978)

1. Scope: This memorandum constitutes Airworthiness Release Qualification Level 3 Authorizing operations of the BUSTER 1-1001 Unmanned Aircraft System in stock configuration or with the Brandebury Gimbal Side Look Camera system for training purposes, check out flights, and test flights as outlined within the Federal Aviation Authority (FAA) approved Certificate of Authorization (COA) areas at Hondo, Marfa, and Carrizo Springs, Texas.
2. Validity: This AWR is only valid with a Federal Aviation Authority (FAA) approved Certificate of Authorization (COA) for the area at Hondo, Marfa, and Carrizo Springs, Texas. This AWR terminates 2 years after issue, upon changes in configuration of the subject equipment, upon issuance of a later AWR, or NVESD discontinues operation and ownership of the system, whichever occurs first. This AWR is valid only for operations within the FAA approved COA areas at Hondo, Marfa, and Carrizo Springs, Texas.
3. Appendices: This memorandum and its appendices shall be carried in the logbook, 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

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4. The points of contact (POC) are (b) (6) RDMR-AEV, commercial
(256) 313-9037, or e-mail: (b) (6) @us.army.mil, or (b) (6) DSN
897-8455, Commercial (256) 313-8455, e-mail: (b) (6) @us.army.mil.

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of Aviation Engineering

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Appendix A - Restrictions and Operating Information

WARNING

The BUSTER UAS has not completed full airworthiness qualification. All flight operations shall be conducted in a manner to minimize exposure to manned aircraft, populated ground areas and roadways open to civil traffic.

WARNING

Accidental operation of the BUSTER UAS outside of the FAA approved COA shall be immediately reported to Air Traffic Control (ATC). The operator shall make immediate actions to correct the flight path and/or follow ATC.

WARNING

The BUSTER UAS has not undergone complete electromagnetic environmental effects (E3) testing. The aircraft may experience erroneous data reports, and/or loss of control of aircraft, and/or loss of control of payload. Operators shall avoid sources of electromagnetic fields such as but not limited to transmitters, power lines, and cell towers.

WARNING

The BUSTER UAS has not undergone Explosive Atmosphere testing. A serious fire or explosion may result if the aircraft is electrically powered while flammable vapors are present during ground or flight operations. The precautions in paragraph 16 of this appendix shall be observed in order to ensure safe operations.

WARNING

The BUSTER UAS does not have a sense and avoid system. Mid-air collision is a risk. All flight operations shall be conducted to ensure that minimum separation standards are maintained.

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WARNING

In the event of an anomaly that would prevent a safe landing, the aircraft will be required to perform an emergency landing at a predetermined location. The area shall be sanitized of personnel.

WARNING

The BUSTER UAS may rely on ground observers to provide airspace deconfliction. If radio contact between the ground observers and the Ground Control Station (GCS) operator is lost; the GCS operator shall return the aircraft to the return home waypoint/return to base (RTB) and loiter until ground observer communications are re-established.

CAUTION

The BUSTER UAS has not been tested for the effects of lightning. Flight operations shall be restricted to no less than 25 nautical miles from lightning activity.

CAUTION

Noise characterization testing has not been completed on this system. Prolonged exposure to engine noise at close proximity may contribute to hearing loss. It is recommended that ear protection be worn while launching/recovering the air vehicle.

CAUTION

Maximum air speed for flight is 35 knots. Launch should not be attempted if crosswind component exceeds 15 knots.

CAUTION

The BUSTER UAS has not been qualified for the effects of icing. Flight operations are not authorized in known or forecast icing conditions.

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CAUTION

The BUSTER UAS has not been qualified for the effects of precipitation. Flight operations shall be restricted from flight into or during measureable precipitation activity within the operational area. In the event of inadvertent flight into precipitation activity the aircraft shall make every attempt to exit the activity.

CAUTION

The BUSTER UAS has not been qualified to MIL-STD-810G environmental temperature extremes to demonstrate that the equipment functions satisfactorily/safely. Therefore; the system may not operate or may cease operation when exposed to extreme temperatures, low pressure environments, and other non-standard climatic conditions. If conditions are entered that are outside of past experience, proceed with caution.

1. The aircraft operating instructions, procedures, and limitations shall be in accordance with references D-1 through D-4 and this AWR.

D-1. Skill Qualification and Certification Test Manual

D-2. Operator's Manual Overview and Deployment

D-3. Operator's Manual Volume Two, Ground Control Station Operation

D-4. Flight Operations Checklist

In the event of conflict between these documents, the information in this AWR shall prevail.

2. Flight of the BUSTER UAS is restricted to Visual Meteorological Conditions (VMC) and 500 feet maximum Above Ground Level (AGL) within the area described in the approved FAA COA.

3. Flight over populated areas is prohibited.

4. The flight path of the aircraft shall be within reach of pre-established ditching points where practicable.

5. In the event of loss of control, local ATC and the ground observers shall be notified immediately.

6. Ground observers shall maintain positive visual contact with the BUSTER at all times.

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7. All observers shall maintain radio contact with the GCS operator throughout the flights.
8. Use of data links is limited to approved frequencies for all ground and flight operations. Data link frequencies shall be de-conflicted through the local frequency manager/coordinator prior to conducting operations.
9. During preflight someone other than the operator shall verify that the Lost Link Return Home Point is entered correctly.
10. The Lost Link Return Home Point shall be inside approved COA areas at Hondo, Marfa, and Carrizo Springs, Texas over a suitable predetermined ditch point, within range of the datalink antenna.
11. An appropriate Lost Link Return Home Point shall be set such that the aircraft will not exit the approved COA airspace during lost link flight.
12. The Lost Link Return Home Point shall be cleared of personnel and posted on-site with appropriate warnings during flight operations. Every effort shall be made to verify the Lost Link Return Home Point is cleared of personnel should the aircraft enter the Lost Link Mode.
13. In the event of an engine failure or other catastrophic failure, local ATC and ground observers shall be notified immediately and the aircraft shall be ditched over the appropriate Lost Link Return Home Point. If not possible to make the Lost Link Return Home Point, every effort shall be made to visually inspect the probable impact area either by the observers or with the payload prior to committing to ditching location.
14. Verified loss of any aircraft flight critical subsystem or Ground Control Station (GCS) flight critical sub-system shall require Return To Base (RTB). Degraded flight control/capability is not authorized.
15. Any unexplained anomaly shall initiate RTB.
16. 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-2 (Operator's Manual) during refueling operations.
 - b. Ground operations of the aircraft shall be conducted at the greatest distance practical (no less than 50 feet) from all other aircraft and fuel depots.

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17. With each installation of a new or different test package integrated within the Brandebury Gimbal Side Look Camera system the Center of Gravity (CG) shall be recalculated and maintained within limits.
18. Prior to first flight with the stated aircraft configuration, a comprehensive EMI/EMC check must be completed and results reported to AED. Any unexplained EMI/EMC anomalies shall be resolved prior to first flight.
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 BUSTER 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.

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Appendix B - Configuration and Installation Detail:

Configuration- This aircraft is a production configuration as identified in references

D-1. Skill Qualification and Certification Test Manual

D-2. Operator's Manual Overview and Deployment

D-3. Operator's Manual Volume Two, Ground Control Station Operation

D-4. Flight Operations Checklist

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.

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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:

a. In accordance with Department of the Army (DA) Pamphlet 738-75 I, the following entries shall be made on the DA Form 2408-13-1 and shall be perpetuated on each form during the period of installation, until superseded by another AWR, or until reason for limitation is removed.

b. Place a circled "X" on the form IAW TAMMS-UAVS. In the Fault Information Block, make the following entry: "Operate within limitations and restrictions specified in the enclosed airworthiness release dated 18 June, 2010."

c. 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.

d. Prior to first flight with the stated aircraft configuration, a comprehensive EMI/EMC check must be completed and results reported to AED. Any unexplained EMI/EMC anomalies shall be resolved prior to first flight.

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Appendix D - Reference List:

1. The BUSTER Miniature Unmanned Air Vehicle System 1-1001 Skill Qualification and Certification Test Manual (1 JUNE 2007), Doc No. A-OM-BUSTROPN-01-000B
2. The BUSTER Miniature Unmanned Air Vehicle System 1-1003 Operator's Manual Overview and Deployment (15 June 2007), Doc. No. A-OM-BUSTROM-03-000D
3. The BUSTER Miniature Unmanned Air Vehicle System 1-1003 Operator's Manual Volume Two, Ground Control Station Operation (15 June 2007), Doc. No. A-OM-BUSTROM-04-000E
4. The BUSTER Miniature Unmanned Air Vehicle System Flight Operations Checklist (6 June 2010), Form A-OM-FLGTOPS-00-000A