



DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF, G-3/5/7
400 ARMY PENTAGON
WASHINGTON, DC 20310-0400

REPLY TO
ATTENTION OF

DAMO-AV-A

MAR 24 2009

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Interim Guidance for Unmanned Aircraft Systems (UAS) Operations in the National Airspace System (NAS)

1. References:

- a. AR 95-23, Unmanned Aircraft System Flight Regulations, 7 Aug 06.
 - b. AR 95-2, Air Traffic Control, Airspace, Airfields, Flight Activities, and Navigational Aids, 16 Oct 08.
 - c. AR 95-1, Flight Regulations, 12 Nov 08.
 - d. FM 3-04.303, Air Traffic Services Facility Operations, Training, Maintenance, and Standardization, 3 Dec 03.
 - e. FM 3-04.300, Flight Operations Procedures, 12 Aug 08.
 - f. UFC 3-260-01, Airfield and Heliport Planning and Design, 17 Nov 08.
 - g. DAMO-AV-A, UAS Interim Guidance, 2 Oct 06.
 - h. DAMO-AV-A, UAS Interim Guidance (enclosed), 19 Mar 09.
2. Reference 1(h) above contains updated interim guidance and criteria for UAS operations in the NAS not covered in current Army Regulations, Field Manuals, and Unified Facilities Criteria.

3. The UAS interim guidance dated 19 Mar 09 applies to the active Army, Army National Guard, and Army Reserve and supersedes interim guidance dated 2 Oct 06.

4. The Army G-3/5/7 POC is (b) (6)
DSN: 656-4865, or email: (b) (6) @conus.army.mil.

Encl

Deputy Chief of Staff, G-3/5/7

DAMO-AV-A

SUBJECT: Interim Guidance for Unmanned Aircraft Systems (UAS) Operations in the National Airspace System (NAS)

DISTRIBUTION:

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Headquarters, United States Army Aeronautical Services Agency
9325 Gunston Road, Building 1466, Suite N319
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**INTERIM GUIDANCE FOR UNMANNED AIRCRAFT SYSTEMS (UAS)
OPERATIONS IN THE NATIONAL AIRSPACE SYSTEM (NAS)**

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SUBJECT: INTERIM GUIDANCE FOR UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE NATIONAL AIRSPACE SYSTEM (NAS)

1. Introduction

The proponent of this interim guidance is the Deputy Chief of Staff, G-3/5/7. This document contains interim guidance and criteria for UAS operations not covered in current ARs, FM's and Unified Facility Criteria (UFC). It applies to the active Army, Army National Guard and Army Reserve. This document supersedes all previous interim guidance and remains in effect until superseded or rescinded. The G-3/5/7 has the authority to approve exceptions or waivers to this interim guidance consistent with controlling law and regulations. The G-3/5/7 delegated approval authority to Commander, US Aeronautical Services Agency (USAASA).

2. Request for FAA Certificate of Authorization (COA) (AR 95-2)

a. UAS operations (in the NAS) outside of restricted airspace or warning areas require a FAA approved COA, except for some operations in Class G airspace. (See paragraph 3, Operations of Small UAS in Class G airspace without a COA)

b. Request for COA will:

(1) Be submitted to the Department of the Army Representative (DAR) office by the O-6/civilian equivalent or higher in the unit's chain of command at least 60 days (recommend 90 days) prior to requested commencement of UAS operations.

(2) Include a completed checklist unless information is entered via COA online. Contact DAR for questions and access to COA online. COA checklist is at appendix B of this document. The following information is required in completing the checklist:

(a) Dates/Times of mission(s).

(b) Altitudes and coordinates (lat/long) of the intended flight operation, and the classification of the airspace (A,B,C,D,E,G). (Include an appropriate scaled map with the area of operations depicted)

(c) UAS physical characteristics/capabilities and a description detailing the aircraft methods of launch and recovery. (Add additional characteristics/capabilities as appropriate)

(d) Airworthiness Release (AWR) from Aviation Engineering Directorate (AED).

(e) Equivalent Level of Safety (ELOS) provisions to meet "see and avoid" requirement of 14 Code of Federal Regulations (CFR) 91.113. This includes qualifications and procedures of chase plane, ground and radar observers. The use of radar alone is not sufficient to achieve an equivalent level of safety to satisfy the "see and avoid" requirement.

(f) Communications procedures of observer to pilot/operator and ATC to pilot/operator.

(g) If hazardous materials are carried aboard the UAS or the intended use includes the dropping or spraying of aircraft stores, the COA request must specifically address this hazard and make a clear case that injury to persons on the ground is unlikely.

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(h) Lost link procedures. UAS must have a means of automatic, autonomous recovery. There are many acceptable approaches to satisfy this requirement, but the intent is to ensure airborne operations are predictable in the event of lost link.

(i) When the mission requires flight over congested areas, populated areas, heavily trafficked roads, or an open-air assembly, the applicant must provide information that clearly articulates that the risk of injury to persons on the ground is highly unlikely.

c. COAs normally apply to one UAS type and concept of operations. The DOD/FAA UAS Memorandum Of Agreement (MOA) dated 24 Sep 07 (appendix A) allows leadership of an ATC facility at a non-joint-use airfield to apply for a COA to cover all UAS operations in the associated Class D airspace. These COA requests will be referred to as the UAS MOA Class D COA. ATC leadership will develop local procedures to comply with existing local traffic pattern, arrival and departure procedures, noise abatement procedures and airfield operating rules. Local procedures are supplementary, but cannot waive or replace procedures in "ATC Procedures for DOD Non-Joint-Use Airfields with Associated Class D Airspace" document (appendix C). Local procedures must be approved by DOD ATC chief prior to implementation and will be published and maintained in the ATC facilities. Contact your FAA Service Area DAR to determine if you may initiate a UAS MOA Class D COA for your facility. Complete COA checklist and provide to the DAR for submission to FAA, IAW paragraph 2b. The DAR will inform the requesting organization that their COA is approved or disapproved. Once the COA is approved, provide any changes to local procedures, unmanned aircraft systems and Airworthiness Release (AWR) to the DAR. The DAR will notify HQ, USAASA (Airspace Branch) of any additional UAS type added to the approved MOA Class D COA.

3. Operation of Small UAS in Class G Airspace without a COA

The DOD/FAA UAS MOA authorizes notification in lieu of a COA for UAS weighing 20 pounds or less, operating below 1200' AGL in Class G airspace over military bases, reservations, or land protected by purchase, lease or other restrictions. This is not applicable to airspace identified in 14 CFR 91.215 (Mode C veil within 30 miles of major airports depicted on sectional by a solid magenta line). The UAS must remain more than 5 nautical miles from any civil use airport or heliport and within clear visual range of the pilot, or certified observer in contact with the pilot. UAS must have an AWR for the planned operations. Contact DAR to confirm this provision applies to your proposed small UAS operation and to complete notification procedures to FAA. A notification memo from an O-6 or civilian equivalent in the chain of command and the AWR is required to be provided to the DAR before planned operations. A sample memo is shown in appendix D and also available from the DAR. The DAR office makes official notifications and will inform the requesting organization when notification is complete. UAS commander will ensure that a Notice to Airmen (NOTAM) is issued 24 hours in advance to alert non-participating aircraft of the operation. UAS commander will verify NOTAM was issued prior to commencing operation.

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OPERATIONS IN THE NATIONAL AIRSPACE SYSTEM (NAS)**

4. Takeoff and Landing Criteria

The following guidance provides arrival and departure criteria for operating UAS at Army facilities. (UAS operations at joint military-civilian use airfields will also comply with provisions of FAA UAS COAs and Joint Use Letter Of Agreement (LOA) developed with the civil authority operating at the airport).

- a. Minimum pavement classification number must support the heaviest equipment/aircraft operated.
- b. Minimum approach angle: 3°
- c. Minimum departure climb rate: 200' per nautical mile.
- d. Approach speed: Treat UAS as CAT A aircraft.
- e. Traffic pattern: Do not mix UAS and manned aircraft in the same traffic pattern. A manned aircraft may follow an unmanned aircraft on final, if authorized in a LOA with the ATC facility exercising jurisdiction.
- f. UAS surface and clearance requirements:

Wing Span	Landing/Takeoff Surface (feet)	Lateral Clearance (feet)	Clearzone (feet)
Wing Span < 20 ft	400x40 *	150 from landing/takeoff centerline **	150**
Wing Span 20 to 30 ft	2000x60 *	150 from landing/takeoff centerline **	200**
Wing Span > 30 ft and < 60 ft	5000x100 *	500 from landing/takeoff centerline **	500**
Wing spans 60 ft and greater	TBDx150 *	500 from landing/takeoff centerline**	1000**

*** Note 1: First Colonel/civilian equivalent in the airfield commanders command chain may waive landing/takeoffs surface criteria after completing a risk assessment and when lesser criteria is specified in the manufacturers or appropriate military operations manual.**

****Note 2: Include fixed and/or mobile objects. Lateral Clearance criteria is not waivable.**

5. ATC Procedures

- a. A comprehensive LOA is required between the unit commander, airfield commander/manager and affected ATC facility chief. Review of proposed LOA by appropriate DAR is required prior to execution. Prepare and maintain LOAs IAW AR 95-2, FM 3-04.303 and AR 25-50.

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b. Approaches: UAS operations require a pre-coordinated missed approach procedure established in the LOA and IAW an approved COA. LOA will cover lost link and/or loss of visual contact procedures.

c. ATC Separation and Phraseology

(1) Treat UAS as CAT A aircraft.

(2) US Army Radar Approach Control (ARAC) facilities will apply CAT A separation standards (IAW FAA Order 7110.65) to UAS operations outside of FAA established active restricted areas.

(3) The restricted area Using Agency (as identified in FAA Order 7400.8) will establish separation criteria to ensure safe operations within their restricted areas.

(4) US Army ATC facilities will utilize standard phraseology IAW FAA Order 7110.65 (taxi to, cleared for takeoff, cleared to land, etc) for communications between ATC and UAS pilot/operators. Non-standard phraseology is not authorized.

6. Chase Plane/Ground/Radar Observers (when required by COA)

a. Unit commander certified observers will provide traffic information to the UAS pilot/operator using standard clock directions, distance, and direction of flight ("Traffic one o'clock, two miles, northbound"). The UAS pilot/operator is responsible for adjusting UAS route of flight to avoid other air traffic.

b. Chase aircraft pilots, while flying the chase aircraft, are not authorized to perform observer or UAS pilot duties. Observers onboard the chase aircraft will not perform UAS pilot duties. To the extent possible, consistent with safety, the chase aircraft should operate within one mile laterally or as per the COA and 3000 feet vertically from the UAS. Observers onboard a chase aircraft must keep visual contact with the UAS at all times.

c. Ground observer duties require continuous visual contact with the UAS. Use of binoculars, or telephoto television as an observation aid is authorized. Visual observers will conduct their duties within one mile laterally or as per the COA and 3000 feet vertically from the UAS.

d. Radar observers must be qualified ATC personnel dedicated to monitoring a single UAS. Radar observers may not perform other ATC services simultaneously. As a minimum, primary radar returns must be enabled. Secondary radar returns may be used in addition to primary radar, but not as a sole source of radar observing. UAS operations must comply with the approved COA.

Note: Chase plane/ground/radar observer duties within active restricted/warning areas are as specified by the Using Agency.

7. Weather Requirements

a. VFR

(1) Must be forecast VFR for entire route of flight at takeoff through 1 hour after landing.

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(2) Flight visibility of 3 miles, cloud clearance requirements 500' below, 1000' above, 2,000' horizontal.

b. IFR (TBA)

8. Lighting

Position lights will be illuminated IAW AR 95-23.

9. Arm/Disarm Pads

Arm/Disarm pads will be constructed and maintained IAW UFC 3-260-01.

10. Facility Requirements

a. Army G-3/5/7 (DAMO-AV) is the proponent for Army requirements for manned and unmanned aircraft hangars. G-3/5/7 is supported by Assistant Chief of Staff for Installation Management (ACSIM) with the aircraft maintenance hangar complex (HGR) facilities design team. ACSIM established Army facility standards for manned and unmanned aircraft hangars on 12 March 2008.

b. Facility standard design can be obtained for the Shadow and Raven UAS at USACE, Savannah District (Center of Standardization). POC: (b) (6) commercial: (b) (6) email: (b) (6)@usace.army.mil.

c. Facility standard design can be obtained for the ERMP, Hunter and Fire Scout UAS at US Army Corps of Engineers (USACE), Mobile District (Center of Standardization). POC: (b) (6) commercial: (b) (6) email: (b) (6)@usace.army.mil.

d. Orientation of the UAS Hangar shall be 90 degrees to centerline of the landing surface or in relationship to hangar door orientation for the manned hangar line. Appropriate markings shall be used to prevent manned aircraft operations in proximity to the UAS hangar access apron or UAS operations IAW the notional Army airfield (AAF) layout contained in the Army standard design for manned and unmanned hangars.

11. UAS Operator/Observer Qualifications

Unit commanders will establish an SOP detailing operator/observer training and certification requirements. Training must include the rules and responsibilities in 14 CFR 91.111 (Operating Near other Aircraft) and 14 CFR 91.113 (Right-of-Way Rules).

a. Refer to AR 95-23 for additional non-crewmember guidance.

b. UAS operator/observers must have vision correctable to 20/20 (both eyes).

12. Operational Restrictions

a. VFR-on Top, VFR-over-the-Top and Special VFR operations are not authorized in the NAS.

b. Simulated engine failures are only authorized in active restricted/warning areas.

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c. Military Authority Assumes Responsibility for Separation of Aircraft (MARSA) operations are not authorized in the NAS.

13. Accident/Incident and Mishap Reporting

In addition to requirements of AR 95-23, AR 385-10 and DA PAM 385-40, report within 24 hours, all UAS accidents or incidents that occur in the NAS to the DAR in which the accident or incident took place and to the Commander, US Army Aeronautical Services Agency, Ft Belvoir, VA, via fax (703) 806-4409.

Appendix A

**Memorandum of Agreement
Concerning the
Operation of Department of Defense Unmanned Aircraft Systems
in the
National Airspace System**

Introduction. On September 28, 2006, the Deputy Secretary of Defense directed the Executive Director, Department of Defense (DoD) Policy Board on Federal Aviation, to pursue an agreement with the Federal Aviation Administration (FAA) to allow ready access to the National Airspace System (NAS) for DoD Unmanned Aircraft Systems (UAS) domestic operations and training. This Memorandum of Agreement (MOA) between the DoD and the FAA sets forth provisions that will allow, in accordance with applicable law, increased access for DoD UAS into the elements of the NAS outside of DoD-managed Restricted Areas or Warning Areas.

To ensure that DoD UAS operations are conducted safely, efficiently, and in accordance with U.S. law, and to ensure DoD UAS assets have NAS access for domestic operations, including the War on Terror (WOT), this agreement assigns the DoD and the FAA specific tasks and responsibilities. This guidance applies to all DoD UAS, whether operated by Active, Reserve, National Guard, or other personnel.

It is the DoD's goal that appropriately equipped UAS will have ready access to the NAS for the conduct of domestic operations, exercises, training, and testing.

It is the FAA's goal that DoD UAS operations are conducted safely and expeditiously, present no threat to the general public, and do no harm to other users of the NAS.

To reach these goals, the DoD and FAA must aggressively collaborate toward an incremental approach in overcoming the technical, regulatory and safety hurdles to reaching these common goals. Both departments jointly agree to the following provisions as the initial steps in their pursuit of ready access to the NAS for DoD UAS operations.

Scope. The policies, procedures and operations prescribed in this MOA apply to the operation of DoD UAS within the NAS. This MOA specifically excludes commercial UAS operation for non-DoD applications and other Government Agencies that operate Public Use UAS.

Authority. Section 106 of Title 49, United States Code provides the authority of the Federal Aviation Administration to set aviation safety standards and regulate aviation operations in the NAS. Title 10 United States Code provides the authority for the Secretary of Defense to set military aviation standards and direct military aviation operations.

UAS Airworthiness Certification. Except where specifically exempted by the FAA, DoD UAS operated outside of Restricted Areas and Warning Areas shall be certified by one of the military departments as airworthy to operate at the appropriate level in accordance with applicable DoD and Military Department standards.

UAS Pilot/Operator¹/Crewmember Qualification. Pilots/operators of DoD UAS shall be qualified by the appropriate Military Department activities to fly in the class of airspace in which operations are to be conducted. DoD UAS pilots/operators in qualification training shall be supervised by a qualified UAS pilot/operator until achieving the appropriate qualification level. DoD UAS ground observers will possess the appropriate medical qualification to perform their duties.

Enhanced DoD UAS Access to the NAS. Where the appropriate qualifications listed above are met, the FAA agrees to provide access to the NAS for DoD UAS outside Restricted Areas and Warning Areas as follows:

- All categories of DoD UAS operations conducted wholly within Class D airspace that has an associated DoD-controlled, non-joint-use airfield, provided²:
 - Operations are not conducted over populated areas or within airspace covered in Section 91.215 (b)(2) of Title 14, Code of Federal Regulations (14 CFR § 91.215(b)(2)).
 - DoD shall develop uniform air traffic control procedures to be applied at all locations. These procedures will be developed in coordination with the FAA prior to implementation and a Certificate of Waiver or Authorization issued to the appropriate DoD Air Traffic facility.
- DoD UAS that weigh 20 pounds or less, under the following conditions:
 - Operations are conducted within Class G airspace, below 1200' AGL (not applicable to airspace identified by 14 CFR § 91.215 (b)(2)) over military bases, reservations or land protected by purchase, lease or other restriction.
 - The UAS remains within clear visual range of the pilot, or a certified observer in ready contact with the pilot, to ensure separation from other aircraft.

¹Note: The term "operator" is a DoD-specific term to describe individuals with the appropriate training and Military Department certification for the type of UAS being operated, and as such, is responsible for the UAS operations & safety. It is used to differentiate from DoD rated pilots of manned weapons systems.

² The DoD, as a service provider for this airspace, does not have the authority to issue waivers to 14 CFR Part 91.

- o The DoD will ensure the UAS remains more than 5 miles from any civil use airport or heliport

DoD components operating under this paragraph will notify the FAA of the proposed operation in advance, and publish Notices to Airmen (NOTAMS) as required to alert non-participating aircraft of the operation. For non-recurring operations, notification will be accomplished, and Notices to Airmen (NOTAMS) published, no later than 24 hours in advance. For recurring operations (e.g. training) standing "blanket" notifications/standing NOTAMs should be used.

DoD/FAA Partnering on UAS Initiatives. To the maximum extent practicable, the DoD and the FAA will partner on efforts to further UAS research, development, standards, testing and certification initiatives as follows:

- **NAS Integration.** The DoD and FAA will coordinate the development of near, mid and long-term UAS standards, procedures, and technical solutions.
- **UAS Research and Development (R&D).** The DoD and the FAA agree to share methodologies, information and results of research and development efforts conducted by their respective organizations. Both organizations agree to, wherever practicable, partner in UAS R&D efforts that show promise for enhancing the safety of DoD UAS operations in the NAS.
- **UAS Testing and Certification.** The DoD agrees to invite FAA participation in DoD-conducted development and testing of UAS components intended to enhance the safety of UAS operations, including detect-and-avoid systems. The FAA agrees to participate in DoD development and testing of said components, and provide input to developing acceptable standards of performance that will allow enhanced DoD UAS NAS access.
- **UAS Safety Data.** The DoD, through the Military Department safety organizations, will collect and share data on UAS operations to support FAA UAS safety studies and analyses. The FAA will provide the requested data elements and reporting format for this data. The FAA agrees to release to the DoD all results and findings of studies and analyses conducted using DoD UAS data, and to share UAS safety information gleaned from public and private sources with the DoD.

Waiver Process. In those cases where meeting all of the certification provisions of this agreement is not possible, or is cost or mission prohibitive, the FAA will review the specific conditions of DoD requests for UAS operations outside of Restricted, Warning, or other areas outside the scope of this document to determine if a Certificate of Waiver or Authorization (CoA) may be issued.

The FAA will strive to process properly-completed DoD CoA applications within 60 days of receipt. In the case of urgent and compelling need (such as "non-training" national security

missions or "active" natural disaster support), the DoD will notify the FAA of the need and reason for priority action, and the FAA will process DoD COA requests as quickly as possible, but not later than 24 hours from receipt of complete mission requirements.

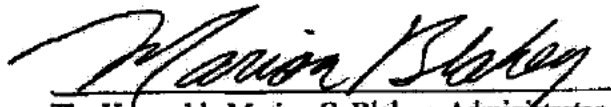
Implementation Plan. The Chairman, DoD Policy Board on Federal Aviation, and the Administrator, Federal Aviation Administration, are charged with formulating policy for their respective organizations to ensure compliance with the provisions of this agreement. The FAA's office of primary responsibility is the Unmanned Aircraft Program Office. This MOA will be reviewed annually or as needed by request of either party and is effective upon the last signature of the Parties.

(b) (6)



9/24/07
Date

For the Federal Aviation Administration


The Honorable Marion C. Blakey, Administrator

June 12, 2007
Date

Appendix B

SUBJECT: INTERIM GUIDANCE FOR UAS OPERATIONS IN THE NATIONAL AIRSPACE SYSTEM (NAS)

Appendix B
COA checklist

Proponent Organization	
Sponsor:	
Attn of:	
Address:	
Address 2:	
City:	
State:	
Postal Code:	
Telephone:	
Email:	

Point of Contact	
Representative:	
Address:	
Address 2:	
City:	
State:	
Postal Code:	
Telephone:	
Email:	

Operational Description	
	Requested Effective Period
	Beginning
	End
	Lights out operations
	VFR operation
	IFR operation
	Day operation
	Night operation
	Program executive summary
	Operational summary

System Description	
	Aircraft Type
	Aircraft Type and Model
	Control Station
	Communication Systems
	Certified TSO Components
	Other

Performance Characteristics		
	Climb Rate	
	Descent Rate	
	Turn Rate	
	Cruise Speed	
	Maximum	
	Minimum	
	Approach Speed	
	Operating Attributes	
	Maximum MSL	
	Minimum MSL	
	Gross Takeoff Weight	
	Launch/Recovery	

Airworthiness release (only one is required)		
	FAA Type Certificate	
	If No FAA Certificate	

Procedures		
	Lost Link/Mission Procedures	
	Lost Communications	
	Emergency Procedures	

Avionics/Equipment		
	Equipment Suffix Type	
	GPS	
	Moving Map indicator	
	Tracking capability	
	TCAM/CAS	
	ELT	
	Transponder	
	On	
	Off	
	Standby	
	Ident	
	Mode S	
	Mode C	
	Transponder retuneable in flight	

Lights		
	Landing	
	Position/Navigation	
	Anti-Collision	
	Infrared (IR)	

ATC Communications		
Two-Way Voice Capability		
Transmitter		
	VHF Band	
	Quantity	
	In-Flight Retunable	
	UHF Band	
	Quantity	
	In-Flight Retunable	
	HF Band	
	Quantity	
	In-Flight Retunable	
Receiver		
	VHF Band	
	Quantity	
	In-Flight Retunable	
	UHF Band	
	Quantity	
	In-Flight Retunable	
	HF Band	
	Quantity	
	In-Flight Retunable	
Guard (Emergency) Frequencies		
	VHF Band	
	Quantity	
	UHF Band	
	Quantity	
Instantaneous Two-Way Voice		
	Direct to Pilot	
	SATCOM	
	Relay via aircraft	

Electronic Surveillance/Detection Capability		
	EO/IR	
	Terrain Detection	
	Weather/icing detection	
	Radar	
	Other	
	Electronic detection system	
	Electronic detection systems attachment	
	Radar Observation	
	NAS Operational Capability	

Visual Surveillance/Detection Capability		
	Maximum distance from UA	
	Vertical	
	Horizontal	
	Airborne based	
	Ground based	
	Visual observation from one side	
	Forward or side looking	
	Attachment for all	

Aircraft Performance Recording		
	Flight data recording	
	Control station recording	
	Voice recording	

Flight Operations Area/Plan			
	Map Attachment	View Attachment	
		Log ID	
		Degree	
		Distance	
	DEPARTURE	Lat/Long	
		MSL Floor	
		MSL Ceiling	
		Min Speed	
		Max Speed	
		Radius	
		Lat/Long	
		MSL Floor	
	WAYPOINT	MSL Ceiling	
		Min Speed	
		Max Speed	
		Radius	
		Lat/Long	
		MSL Floor	
	WAYPOINT	MSL Ceiling	
		Min Speed	
		Max Speed	
		Radius	
		Lat/Long	
		MSL Floor	
	ARRIVAL	MSL Ceiling	
		Min Speed	
		Max Speed	
		Radius	

Flight Aircrew Qualifications		
Pilots		
	DOD certified/trained	
	Other certified training	
	Trained on FAR PART 91	
	Medical Certification Class	
	Currency status	
	Duty time restrictions	
	Single UAS control	
	UAS description	
	Total number of UAS controlled	
Observers		
	DOD certified/trained	
	Trained on FAR PART 91	
	Currency status	
	Duty time restrictions	
	Single UAS control	
	UAS description	
	Total number of UAS controlled	

Special Circumstances		
		REMARKS
	Special Circumstances	



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JAN 23 2009

MEMORANDUM FOR ASD(NII) (b) (6)
OUSD(P) (b) (6)
OUSD(AT&L) (b) (6)
OSD/DGC A&L (b) (6)
JCS/J-5 (b) (6)
DCS/G-3/5/7 (b) (6)
N88 (b) (6)
DCS/A3/5 (b) (6)
USMC/AVIATION (b) (6)

SUBJECT: ATC Procedures for Department of Defense (DOD) Non-Joint-Use Airfields with Associated Class D Airspace

I have enclosed revised ATC Procedures for DOD Non-Joint-Use Airfields with Associated Class D Airspace to operate DOD Unmanned Aircraft Systems for Service use effective on 21 January, 2009. The procedures were developed pursuant to DEPSECDEF memorandum, Subject: Memorandum of Agreement for Operation of Unmanned Aircraft Systems in the National Airspace System dated 24 September 2007. They meet the requirements of the "DOD-FAA MOA Concerning the Operation of DOD UAS in the NAS" entered into by the FAA Administrator and the Deputy Secretary of Defense effective 24 September 2007. The procedures when employed properly will simplify and expedite UAS COA approvals at DOD airfields.

These procedures were developed by Service operations and air traffic control subject matter experts and have been coordinated with the FAA. The procedures replace DOD Operations and ATC Procedures for Non-Joint-Use Airfields with Associated Class D Airspace released May 20 2008. They should be considered an integral part of DOD airfield operations and attached to all applicable UAS COA requests.

Please feel free to contact me at (b) (6) who chaired the DOD UAS ATC procedures working group, at (b) (6) with any questions.

(b) (6)

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1 Attachment
DOD Procedures

ATC Procedures for DOD Non-Joint-Use Airfields with Associated Class D Airspace

1. Purpose. To meet requirements for uniform air traffic control procedures as specified in the DOD/FAA Memorandum of Agreement (MOA) Concerning the Operation of Department of Defense Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) dated 24 September 2007.

2. Scope.

a. The procedures in this document outline standards for ATC procedures at DOD non-joint-use airfields with associated Class D airspace conducting UAS operations.

b. This document cannot be amended without prior coordination with the Service's representative to the DOD Policy Board on Federal Aviation, who will in turn coordinate proposals within DOD and with the FAA.

NOTE: For list of DOD Military-Civilian Joint-Use Airfields see Appendix 1

3. Provisions. All personnel subject to the requirements of this document shall comply with the following provisions:

a. Applicable Federal, State, and local laws, Service Regulations, applicable Code of Federal Regulations (CFRs), FAA Orders and the DOD/FAA Memorandum of Agreement Concerning the Operation of Unmanned Aircraft Systems in the National Airspace System (DOD/FAA MOA).

b. Operation of UAS in Class D airspace at non-joint-use airfields is limited to DOD UAS operations and contract operations conducted solely under the direction of Department of Defense or one of its entities.

c. Prior to commencing and at the conclusion of operations, DOD ATC shall advise ATC facilities providing approach control service to the applicable airfield that Unmanned Aircraft (UA) operations are being conducted. Local coordination will be effected with impacted ATC facilities to include normal, emergency and contingency operations.

4. Definitions.

a. **NORDO aircraft:** Any aircraft operating within the Class D airspace without two way radio communication with the ATC facility per 14 CFR Part 91.

b. **UA Zones:** Marshalling areas, defined by geographic, visual or GPS reference, used by UA and ATC as departure/arrival points to/from airfield, as depicted in the Certificate of Authorization (COA). UA Zones are also used for lost link and emergency orbit points for UA.

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c. Lost link: UAS pilot/operator has lost the ability to provide real-time control of the UAS. Loss may be permanent or temporary.

5. Procedures. The following procedures will be applied at all non-joint-use DOD-controlled airfields with approved COA.

a. General Procedures.

(1) If equipped, UAs shall be operated at all times with full lighting and transponders.

(2) Procedures for deconfliction of UA and transient aircraft traffic will be specified in the COA. Possible methods of use: altitude restrictions for UA, visual holding points with specific lateral and vertical limits, use of ground observers.

(3) The UA mission commander shall advise ATC of initiation and completion of flight operations.

(4) Radio check between UA pilot/operator and ATC will be conducted prior to operations.

(5) All communications between ATC and UAS pilot/operator will be accomplished on designated primary and/or alternate ATC frequencies. Secondary/backup communications and/or telephone connectivity will be precoordinated.

(6) All UAS operations will be conducted under Visual Flight Rules (VFR) in accordance with applicable Service Regulations and FARs. Increased ceiling and visibility requirements can be applied.

b. ATC Procedures.

(1) Description of aircraft types. Describe UAS to other aircraft by stating "unmanned aircraft."

(2) ATIS Procedures. Make a new recording when UAS operations are in effect or have terminated for the day.

(3) Sequencing and Spacing Application. UAS pilots cannot be instructed to follow another aircraft.

(4) Simultaneous Same Direction, all UAS will be treated as "other" aircraft.

(5) Same Runway Separation, all UAS will be treated as Category III aircraft.

(6) Use of Visual Separation between UAS and manned aircraft or UAS and UAS is not authorized.

(7) SVFR is not authorized with UAS.

(8) Preventive Control. May only be applied in accordance with FAAO JO 7110.65.

(9) Transient Aircraft Procedures. ATC will keep the UA pilot/operator apprised of any known transient aircraft operations that may impact operations. UA pilot/operator will take all necessary actions to maintain lateral and vertical separation. ATC should provide UA pilot/operator recommended altitudes or direct to predetermined points (UA Zones) to ensure deconfliction.

(10) For the purpose of applying wake turbulence rules see FAAO JO 7110.65 PCG A-6 and Appendix 2, (list of DOD UAS). In addition to the requirements of FAAO 7110.65, ATC will apply the following procedures:

(a) Issue cautionary wake turbulence advisories, and the position, altitude and direction of flight to the pilot/operator of UAS landing behind all manned aircraft regardless of weight class.

(b) Wake turbulence rules cannot be waived by the UAS pilot/operator.

c. NORDO Aircraft Procedures.

(1) ATC will notify UA pilot/operators of any known NORDO aircraft.

(2) ATC will broadcast on emergency frequencies when an NORDO aircraft is present to expeditiously establish two-way radio communications with NORDO aircraft.

(3) UAS pilot/operator, assisted by ATC, will determine best method to separate UAS and NORDO aircraft. Examples of separation methods:

(a) UA may proceed to a UA Zone to hold

(b) Cease operations and land if it will not aggravate the situation

(c) Altitude deconfliction

NOTE: All aircraft who do not establish two-way radio communication as per CFR prior to entering Class D airspace will be reported to the FAA.

d. Emergency Procedures.

(1) ATC will apply the procedures listed in Chapter 10, Section 1 of FAAO JO 7110.65. Minimum required information for in-flight emergencies:

(a) Aircraft identification and type

(b) Nature of the emergency (lost link, equipment failure)

(c) Intentions of the UA pilot/operator

(d) Aircraft altitude / position

(e) Fuel remaining in time

(2) The safety of manned aircraft will take precedence over unmanned aircraft in an emergency situation.

(3) If primary radio communications between UA pilot/operator and ATC are lost, UA pilot/operator or ATC will be notified immediately via designated alternate communications method. Failure to establish or maintain radio communication between UA pilot/operator and ATC will require termination of UA operations.

(4) If lost link occurs, UAS pilot/operator will immediately notify ATC with the following information:

(a) Time of lost link

(b) Last known position

(c) Altitude

(d) Direction of flight

(e) Confirm execution of lost link procedures

(f) Confirm pilot/observer have visual contact with UA

NOTE: UA lost link is an emergency, but may not require crash-rescue services

(5) In the event of lost link, lost communication between UAS pilot/operator and ATC or lost communication between UAS pilot/operator and observer, ATC will do the following:

(a) Cease aircraft launches until status of affected UAS is determined

(b) Recover other UA as appropriate

(c) Issue advisories and ATC instructions as appropriate to insure the safe operation of all aircraft

APPENDIX 1

DOD Military-Civilian Joint Use Airfields

Army
Blackstone AAF, Fort Pickett, VA
Guernsey AAF, Camp Guernsey, WY
Dillingham AAF, Waialua, HI
Forney AAF, Fort Leonard Wood, MO
Robert Gray AAF, Fort Hood, TX
Grayling AAF, Camp Grayling, MI
Libby AAF, Fort Huachuca, AZ
Sherman AAF, Fort Leavenworth, KS
McCoy AAF, Fort McCoy, WI
Wright AAF, Fort Stewart, GA
Air Force
Air Force Plant 42, Palmdale, CA
Charleston AFB, Charleston, SC
Dover AFB, DE
Eglin AFB, Valparaiso, FL
Grissom ARB, Kokomo, IN
Kelly AFB, San Antonio, TX
March ARB, Riverside, CA
Scott AFB, Belleville, IL
Sheppard AFB, Wichita Falls, TX
Westover ARB, Springfield, MA
Navy
None
Marines
MCAS Yuma AZ

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APPENDIX 2

DOD UAS Types and Weight

Types	Weight
MQ-1 Predator	2,250 lb
MQ-1C Sky Warrior	3, 200 lb
RQ-2 Pioneer	452 lb
RQ-4 Global Hawk	26,750-32,250 lb
RQ-5A/MQ-5B Hunter	1620-1950 lb
RQ -7 Shadow	375 lb
RQ-11 Raven	4 lb
RQ-14 Dragon Eye	6 lb
RQ-16A MAV	15 lb
MQ-8 Fire Scout	3,150 lb
MQ-9 Reaper	10,500 lb

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Appendix D

DEPARTMENT OF THE ARMY
Organizational Name/Title
STREET ADDRESS
CITY, STATE, AND ZIP + 4 CODE

REPLY TO
ATTENTION OF:

MEMORANDUM FOR Department of the Army Representative (DAR), Federal Aviation Administration Eastern Service Area (ASO 920), P.O. Box 20636, Atlanta, GA 30320-0631

SUBJECT: Notification of Class G Airspace UAS Operations (20 pounds or less)

1. This memorandum constitutes notification of intent to operate DOD Unmanned Aircraft Systems (UAS) that weigh 20 pounds or less flown below 1200' AGL within Class G airspace as specified in Memorandum of Agreement for Operation of Unmanned Aircraft Systems in the National Airspace System; effective 24 Sep 07. The following required information is provided:

- a. Unit or organization name.
 - b. Types of UAS (list each type if more than one UAS).
 - c. Total weight of each UAS with all additional payloads.
 - e. Geographical area of operations (attachment: map and coordinates depicting UAS operations area, launch/recovery site and lost link orbit area/point).
 - f. Start and end date (not to exceed one year).
 - g. Times of operations (examples: Daily, 1100 hours to 2200 hours (use zulu times); Intermittent from sunrise to sunset; 2-3 flights per week, intermittent 24 hours a day).
 - h. Altitude
2. Operations are conducted over military bases or land protected by purchase, lease or other restriction. No airspace as described in 14 CFR, 91.215 (b)(2) is involved.

Office Symbol

SUBJECT: Notification of Class G Airspace UAS Operations (20 pounds or less)

3. UAS is certified by US Army Research, Development and Engineering Command, Aviation Engineering Directorate (AED) as airworthy to operate. All pilot/operators are qualified to operate UAS IAW AR 95-23.
4. All Pilots/operators will ensure the UAS remains within clear visual range of the pilot, or a certified observer in ready contact with the pilot, to ensure separation from other aircraft.
5. All Pilots/operators will ensure the UAS remains more than 5 miles from any civil use airport or heliport.
6. A Notice to Airmen (NOTAM) will be published to alert non-participating aircraft of UAS operations. For non-recurring operations, NOTAMS will be published no later than 24 hours in advance. For recurring operations (e.g. training) a standing "blanket" NOTAM will be issued.
7. In accordance with AR 95-23, paragraph 2-10, UAS will have anti-collision lights on when UAS engines are operating, except when there may be other hazards to safety. Position lights will be on between official sunset and sunrise, unless a waiver IAW AR 95-23 has been obtained from HQDA (DAMO-AV). Copy of waiver attached.
8. I understand all accidents/incidents must be reported promptly to the DAR FAA Eastern Service Area.
9. My point of contact is xxx, Office Symbol, DSN: xxx-xxxx, commercial: (xxx) xxx-xxxx, email address:

Encl