



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Air Traffic Organization Policy

ORDER
JO 7200.23

Effective Date:
October 3, 2016

SUBJ: Unmanned Aircraft Systems (UAS)

This order combines new guidance for implementing 14 Code of Federal Regulations (CFR), Part 101, Subpart E, Special Rule for Model Aircraft, and 14 CFR, Part 107 Small Unmanned Aircraft Systems (sUAS) with existing UAS guidance in J NO 7210.891 Unmanned Aircraft Operations in the National Airspace System (cancelled) and General Notice (GENOT) JO 7210.886, Model Aircraft Operations in the Vicinity of Airports (cancelled). This provides a single source document for Air Traffic Organization (ATO) personnel, in any class of airspace.

Until recently, FAA policy for UAS operations has been that no person may operate a UAS, including tethered UAS in the NAS without specific authorization. This will change with the implementation of the sUAS Rule, effective on August 29, 2016. The sUAS Rule includes Part 107 for civil operators (and public operators electing to operate as civil) weighing less than 55 pounds, as well as Part 101 for those operators also known as Section 336 or modelers/hobbyists. The Certificate of Waiver or Authorization (COA) process will still be used for operations that cannot be conducted under Part 101 or Part 107.

Part 107 allows sUAS operations in Class G airspace without Air Traffic Control (ATC) authorization. For sUAS operations in Class B, C, D and E surface areas, the operator may request authorization. Operations in Class A are not addressed under Part 107 because the operational restrictions in Part 107 do not allow access to Class A airspace without a waiver. All sUAS operating under this rule are exempt from separation standards.

The Unmanned Aircraft Systems Integration Office predicts between 400,000 and 2.3 million licensed Part 107 operators by 2020. Although automation is in development to process the large number of requests that facilities anticipate, it is not expected to be operational until 2018. In order to mitigate the impact of authorizing numerous requests on individual ATC facilities, FAA Headquarters has developed a procedure for the authorization of Part 107 Operations. Using input from ATC facilities, areas in which Part 107 Operators may fly without impact to manned aircraft operations and procedures for the approval/denial of applications have been developed and described in this order.

The current guidance for modelers/hobbyists will not change, but they will be referred to as Part 101 operators. Per Part 101.43, Subpart E, no person may operate model aircraft so as to endanger the safety of the national airspace system.

Original signed by Heather Hemdal

8/19/2016

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Date Signed

Distribution: ZAT-721; ZAT-464

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Chapter 1. Introduction

- A. Purpose of This Order.** This order provides information and guidance on air traffic policies and prescribes procedures for the planning, coordination, and services involving the operation of Unmanned Aircraft Systems (UAS) in the NAS.
- B. Audience.** Air Traffic Services, Mission Support, ATO Safety and Technical Training, and System Operations; and all associated air traffic control facilities; and the Flight Service's divisions at Federal Aviation Administration (FAA) Washington Headquarters.
- C. What this Order Cancels.** This order cancels J NO 7210.891 Unmanned Aircraft Operations in the National Airspace System and GENOT JO 7210.886, Model Aircraft Operations in the Vicinity of Airports.
- D. Where Can I Find This Order?** This order is available on the MyFAA employee Web site at https://employees.faa.gov/tools_resources/orders_notices/ and on the FAA Web site at http://www.faa.gov/regulations_policies/orders_notices/
- E. Distribution.** This order will be distributed to the following Air Traffic Organization (ATO) service units: Air Traffic Services, Mission Support, and System Operations; and all associated air traffic control facilities; and the Flight Service's divisions at Federal Aviation Administration (FAA) Washington Headquarters.
- F. Policy.** This order establishes air traffic policy for UAS operations in the National Airspace System (NAS).
- G. Related Publications.**
1. Title 14, Code of Federal Regulations, Part 91, Part 101 and Part 107
 2. FAA Order JO 7110.65, Air Traffic Control
 3. FAA Modernization and Reform Act of 2012 (FMRA) , P.L. 112- 95
 4. FAA Order JO 7210.3, Facility Operation and Administration
 5. FAA Order JO 7610.4, Special Operations
 6. Obstruction/Evaluation/Airport/Airspace/Analysis (OEAAA), COA online
 7. Flight Standards Information Management Systems (FSIMS) 8900.1 Volume 16
 8. FAA Order JO 7210.632, Air Traffic Organization Occurrence Reporting
 9. FAA Order JO 7200.20, Voluntary Safety Reporting Program (VSRP)
 10. AC 91-57, Model Aircraft Operations
 11. AC 107-2 Small Unmanned Aircraft Systems

Chapter 2. Operational Procedures

A. Responsibilities: Controllers are not required to provide ATC services, including separation to all Part 101 or Part 107 operations. Approved separation for the class of airspace under the appropriate Visual Flight Rules (VFR) or Instrument Flight Rules (IFR) must be provided to UAS operators operating under a Part 91 COA.

NOTE: Part 107 operations by rule are exempt from the Part 91 rules that define VFR and IFR operations, therefore, Part 107 operations are not defined as VFR or IFR and require no separation or services by ATC.

NOTE: In accordance with JO 7110.65, para. 2-1-1, ATC is not required to provide services, including separation, to modelers/hobbyists. Per Part 101.43, Subpart E, no person may operate model aircraft so as to endanger the safety of the national airspace system.

NOTE: UAS operating under Part 91 COAs can be VFR or IFR. Approved separation and services must be provided based on the class of airspace of the operation. Additional ATC procedures are described in Chapter 5 of this order.

B. Termination of Operations: If it is determined that any UAS operation under Part 91, Part 101, or Part 107 may endanger the NAS, then ATC may exercise the authority to terminate the UAS operation.

NOTE: The pilot's name and contact information is contained in the authorization.

C. Advisory Information.

1. Issue Unmanned Aircraft (UA) advisory information for known UA activity, in accordance with JO FAA 7110.65, 2-1-21.

EXAMPLE-

UAS ACTIVITY, (position), (altitude), (course), (type UAS)

EXAMPLES-

“UAS Activity, 12 o'clock, 1 mile, 400 feet and below, quad copter.”

“UAS Activity, 2 miles east of Brandywine Airport, 300 feet and below.”

2. Issue UA advisory information for pilot-reported, or tower-observed activity, in accordance with JO FAA 7110.65, 2-1-21. Continue to issue advisories to potentially impacted aircraft for 15 minutes following the last report.

EXAMPLE-

UAS ACTIVITY REPORTED/OBSERVED, (position), (altitude), (course), (type UAS)

EXAMPLES-

“UAS Activity reported, 12 o'clock, 1 mile, altitude reported one thousand two hundred.”

“UAS Activity observed, 1 mile east of Trenton Airport.”

D. UAS Reporting. All employees must ensure that all known unauthorized UAS activities through either direct involvement or observation, are documented. These occurrences or conditions must be reported using the processes contained within JO 7210.632 and this order, Air Traffic Organization Occurrence Reporting or JO 7200.20, Voluntary Safety Reporting Program (VSRP). Submission of a VSRP report satisfies non-management employees' requirement to report according to these directives except when the employee providing air traffic services determines that pilot actions affected national

security or the safety of operations. When such a determination is made, UAS activities must also be reported in the Comprehensive Electronic Data Analysis and Reporting (CEDAR) as a Mandatory Occurrence Reporting (MOR) in accordance with FAA JO 7210.632 and this Notice.

1. Reporting Unauthorized or Suspicious UAS Activity. ATC must notify the Domestic Events Network (DEN) Air Traffic Security Coordinator (ATSC) of any reported or observed unauthorized UAS activity (in accordance with FAAO 7610.4, Special Operations) and document the incident via MOR using CEDAR, or VSRP, as authorized. Additionally, if UAS activity is creating a hazard to air traffic, facilities may contact their local law enforcement. Ask the local law enforcement to inform the UAS operator of the hazard they are creating to air traffic and to cease the operation. If local law enforcement can obtain the operator's name and address, include this information in the MOR to support possible enforcement action.

2. Reporting Safety Hazards Created by Authorized UAS Operations. Any authorized UAS operation that is conducted in an unsafe manner must be terminated. Report the noncompliance UAS activity to the DEN and via MOR using CEDAR, or VSRP, as authorized. Please note within the MOR the COA number and violation that occurred.

Chapter 3. Part 101, Subpart E Operations

- A. ATC services.** ATC services, inclusive of separation, are not provided to Part 101, Subpart E operators (also known as modelers/hobbyists).
- B. Notification.** Part 101 operators are required to notify the airport and ATCT, if one is operational, when operating within 5 statute miles of the airport.
1. If the facility is contacted directly and the operation poses no hazard:
 - a. Acknowledge the notification.
 - b. Do not use the word “approved” in the communication with the operator.
 2. If the facility determines that a hazard exists:
 - a. Deny the operation .
 - b. State the reason for denial.

REFERENCE: FAA JO 7110.65, para 2-1-1; 14 CFR, Part 10, Subpart E; FAA Reauthorization and Modernization Act 2012, Section 336; and AC 91-57.

Chapter 4. Part 107, sUAS Operations

A. Headquarters Airspace Authorization Procedures.

1. Headquarters, on the facility's behalf, will use the UAS Facility Maps (UASFM) to evaluate Part 107 requests based on the location and altitudes authorized by the facility.

a. If requests are authorized using the UASFM, no facility coordination is required.

b. If Headquarters is unable to authorize the request using the UASFM, they must coordinate with the facility.

c. Full time Class E surface areas are processed at Headquarters. Headquarters coordination with facilities will not be required for Class E surface area approval.

d. Authorization for Class C and Class D airspaces that revert to Class E surface areas will be processed using the UASFM when the Class E surface area is active.

2. Headquarters is responsible for issuing waivers to the proponent. In instances where the request incorporates a waiver, all pending waivers must be included with the authorization request, and coordination must take place with the facility.

3. If the application is authorized, Headquarters will forward an email notification to the facility and the proponent of the approval which will contain:

a. Waivers if applicable.

b. Depiction of the location/altitude of the operation (for reference only).

c. Contact information for communication/recall.

d. Times of operation.

4. If after coordinating with the facility, the operation cannot be authorized, Headquarters will forward an email notifying the facility of the denial.

5. Waiver Process.

a. Applications for waivers are submitted to Headquarters.

b. UASFMs must not be used for authorizations that contain waivers.

c. Under Headquarters waiver process, ATO approval is required for the following waivers:

(1) Visual line of sight (Part 107.31).

(2) Yielding the right of way (Part 107.37a).

(3) Operations in Certain Airspace (Part 107.41).

(4) Maximum altitude (Part 107.51b).

d. Under Headquarters waiver process, AFS may approve waivers requested for the following items and will coordinate authorization with ATC, if needed:

(1) Operations from a moving vehicle or aircraft (Part 107.25).

(2) Daylight operation (Part 107.29).

- (3) Visual observer (Part 107.33).
- (4) Operations of multiple UASs (Part 107.35).
- (5) Operation over people (Part 107.39).
- (6) Maximum groundspeed (Part 107.51a).
- (7) Minimum flight visibility (Part 107.51c).
- (8) Cloud minimum (Part 107.51d).

e. Waivers in Class E surface areas and Class G airspace (including those waivers that take the aircraft into Class E airspace) will be approved by Headquarters, but facility coordination will occur if deemed necessary by Headquarters.

f. Headquarters will evaluate the waiver(s) for justification, including supporting data and documentation as necessary that establishes that the proposed operation can be safely conducted under the terms of a certificate of waiver. When appropriate, Headquarters will coordinate with the air traffic facility to evaluate if the proposed operation can be safely conducted based on the proposed mitigation(s) and, if needed apply any additional mitigations/ limitations.

B. Facility Responsibilities

1. General. In the event a Part 107 operator contacts an ATC facility directly for authorization, the facility must not issue authorization. The facility must direct the operator to the FAA UAS website, www.faa.gov/uas.

2. UASFM:

a. The Air Traffic Manager (ATM) will designate primary and secondary UASFM Point of Contact(s) (POC(s)). When there are changes to the POC(s), notify Headquarters at uasfm@faa.gov.

NOTE: Facilities may use the facility group email address as their POC.

b. UASFM must be developed in accordance with Appendix A.

c. The ATM will review the maps annually, or whenever modifications are necessary. Reasons for modifications include, but are not limited to:

- (1) Airspace changes.
- (2) Runway or airport property changes.
- (3) Changes in procedures.
- (4) Changes in volume of traffic.

d. If changes need to be made to the UASFM, forward your request to uasfm@faa.gov.

3. Headquarters is the only entity authorized to issue authorizations for Part 107 operations within the UASFM parameters.

4. Coordinated approval. If Part 107 operations cannot be authorized using the UASFM, facilities will be contacted by Headquarters for coordination.

a. Facilities will evaluate the request for an authorization for impact to the operation. Waivers listing any mitigations pending approval by Headquarters, will be included with the authorization request for the facility's consideration.

b. If the facility deems the impact of the operation to be acceptable as proposed, the operation will be authorized.

c. If the facility deems the impact to be unacceptable as proposed, they may prescribe mitigations on the operation, which may include, but are not limited to:

- (1) Limits on altitude.
- (2) Adjusting times and dates of operation.
- (3) Operator notification to the Facility (*i. e.*, start, stop times).
- (4) Adjusting Location.

d. If mitigations cannot be agreed upon the operation will be denied.

NOTE: Any equipage-based mitigation should be limited to, at most, requiring communications with the operator.

5. UAS Authorization Dissemination.

a. The ATM must ensure that there are procedures for UAS activity dissemination.

b. The ATM will appoint a primary and secondary Facility UAS Authorization Point of Contact who will receive notification of the final authorization from Headquarters. Forward any changes to the Facility UAS Authorization POC to 9-AJV-115-Part107notification@faa.gov.

NOTE: Facilities may use the facility group email address as their POC. The authorization POC will be used for all Part 107 authorization and waiver requests.

c. The Facility UAS Authorization POC will forward the authorization in accordance with the facility's locally adopted procedures.

d. The ATM/Operational Manager/Front Line Manager (FLM)/Controller In Charge (CIC) will evaluate the information and determine if it needs dissemination to the controller, including facilities that are responsible for the airspace after closing.

e. The Part 107, FAA Form 7711-1 must be retained with the daily log.

Chapter 5. Part 91, UAS Operations

The following provisions are limited to non-Part 107 operations that require a COA.

A. Part 91 UAS Operations Types and Authority.

1. For Public aircraft wishing to operate under Part 91.

a. Public aircraft operations are defined in 14 CFR, Part 1, Definitions & Abbreviations and 49 U.S.C. § 40102, 40125.

b. For UAS operating as public aircraft, the authority is the Certificate of Waiver or Authorization (COA). These COA types include:

- (1) Standard COA.
- (2) Blanket COA.
- (3) Class D/G Notifications Memorandum of Agreement.

2. For Civil aircraft wishing to operate under Part 91.

a. Any operation that does not meet the statutory criteria for a *public aircraft operation* is considered a civil aircraft operation and must be conducted in accordance with all FAA regulations applicable to the operation.

b. For UAS operating as civil aircraft, the authority is a special airworthiness certificate, or a FAA Modernization and Reform Act of 2012 (FMRA) Section 333 exemption with COAs.

(1) An exemption granted in accordance with Section 333 and a COA may be used to perform commercial or other operations that are considered non-hobby or non-recreational in low-risk, controlled environments.

(2) When the Section 333 exemption is granted, the petitioner will be issued a Blanket COA. If the operation cannot be conducted under the provisions of the Blanket COA, the proponent must apply for a Standard COA. A waiver request to a Blanket COA will not be approved.

c. Special Governmental Interest (SGI) Addendum (formerly called Emergency COAs). Public and, in select cases, civil UAS operations may need to be conducted to support activities, which answer significant and urgent governmental interests, including national defense, homeland security, law enforcement, and emergency operations objectives. In the event that these operations cannot be supported by the FAA's regular COA processes due to their exigent circumstances, they may be conducted under the authority of a COA addendum granted through the Special Governmental Interest (SGI) process managed by System Operations Security and further outlined in Chapter 6 of this Order. The FAA may apply this process if the following conditions are met:

(1) The proponent is operating under the authority of an active COA (including Blanket COAs).

(2) The UAS operations to be authorized must be conducted within a timeframe incompatible with the processing time required for regular COA processes, as determined by System Operations Security.

(3) The requested operations must be flown by a governmental entity or sponsored by a government entity (i.e., the operation is to be flown at the request of or is specifically supported by a government entity) as determined by System Operations Security.

(4) The operations must directly support an active (e.g., not demonstration) homeland security, law enforcement, or emergency operations effort, or some other response, relief, or recovery activity benefiting a critical public good – e.g., restoration of an electrical grid or some other critical infrastructure. The fulfillment of this requirement is determined by System Operations Security in consultation, as needed, with the FAA's interagency partners.

d. Classified UAS Operations: Select public UAS operations may be of sufficient national security sensitivity that they are classified. These operations are carried out under the authority of COAs granted by System Operations Security.

B. UAS Operations Information and ATO Guidance for UAs Operating Under Part 91.

1. General.

a. The UAS Pilot in Command (PIC) is to give way to all manned aircraft, except when operating under IFR.

b. UAS operations should not impede, delay, or divert manned aircraft operations, except as directed by ATC for operational necessity.

c. UA proponent compliance with the provisions of the COA and/ or Memorandum of Agreement (MOA) between the using agency and FAA HQ is required.

d. Flights outside of Class A airspace require that a Notice to Airmen (NOTAM) be issued. The responsibility lies with the proponent for requesting and ensuring the NOTAM has been published. In addition to required information, the NOTAM should also include COA and/or Exemption number.

e. Flights below FL180 must have a dedicated observer. These duties will be performed by a ground based observer or chase plane. UA pilots and observers must be responsible for only one UA at a time, unless authorized in the COA.

(1) Daisy chaining of observers or observers on a moving platform may be approved on a case by case basis and as authorized in the COA.

(2) When a ground based/chase plane observer is required a pilot may not perform concurrent duties as the pilot and an observer. When a chase aircraft is used, the flight of the chase aircraft is conducted as a VFR operation.

f. Procedures for non-joint-use Department of Defense (DOD) airfield operations will be specified by the DOD.

g. Specific procedures to ensure separation may be established by a Letter of Agreement.

h. Some UAS receive their communications through a satellite, which may result in latency issues during pilot/ controller communication.

2. Air Traffic Responsibilities

a. UAs flying under IFR should be handled the same as manned IFR aircraft, however consideration should be given to the UA performance characteristics.

b. Lost Link Procedures will vary based upon the type UAS and must be included in the COA. ATC specialists must have access to all coordinated information available in its simplest form, to determine the actions a UA will take in these scenarios. CIC/FLMs should ensure that coordinated information is available and if known that the controller has a method of contacting the appropriate UA PIC.

c. The following operations are not authorized for UAS:

- (1) Instructions to visually follow another aircraft
- (2) Opposite Direction Operations (ODO)
- (3) Special VFR operations
- (4) Visual approaches
- (5) Operations requiring UAS to maintain visual separation.

d. The use of sequencing as indicated in FAA JO 7110.65, Chapter 3, Section 3 is authorized with the exception of issuing instruction to follow another aircraft or to maintain visual separation.

e. In the event of a UAS emergency, procedures outlined in FAA JO 7110.65, Air Traffic Control, Chapter 10, will be followed.

f. Air Traffic Facility Management at facilities where UAS operations are being conducted, are required to ensure air traffic controllers are familiar with the contents of each COA and any applicable Letters Of Agreement (LOAs) impacting their area of specialization.

g. Operational communication with any UA PIC must be on a recorded line, when available.

3. UAS operations in Class A airspace.

a. UAS must operate on an IFR flight plan and a standard COA.

b. UAS must comply with provision of Part 91.135.

c. ATC must provide separation and ATC services per FAA JO 7110.65 requirements with consideration given to UA performance characteristics and potential latency issues.

4. UAS operations within Terminal Radar Service Area (TRSA) airspace. ATC must apply TRSA services and procedures in accordance with FAA JO 7110.65, Chapter 7, Section 7.

5. UAS operations within Class B airspace.

a. Operations in Class B will be considered on a case-by-case basis during COA processing and will be flown under a standard COA.

b. UAS must comply with the provisions of Part 91.131, unless otherwise authorized by the jurisdictional ATC facility.

c. ATC must provide Class B services and apply procedures in accordance with FAA JO 7110.65, Chapter 7, Section 9.

6. UAS operations within Class C airspace.
 - a. UAS must comply with the provisions of Part 91.130 unless otherwise authorized by the jurisdictional ATC facility.
 - b. ATC must provide Class C services and apply procedures within the designated Class C airspace and the associated outer area in accordance with FAA JO 7110.65, Chapter 7, Section 8.
 - c. UAS must operate on a standard COA.
7. UAS operations within Class D airspace.
 - a. UAS must comply with the provisions of Part 91.129, unless otherwise authorized by the jurisdictional ATC facility.
 - b. UAS must operate on a standard COA.
8. UAS Operations in Class E.
 - a. UAS must comply with provisions of Part 91.127, unless otherwise authorized by the jurisdictional ATC facility.
 - b. UAS must operate on a standard or blanket COA.
9. UAS Operations in Class G.
 - a. UAS must comply with provisions of Part 91.126, unless otherwise authorized by the jurisdictional ATC facility.
 - b. UAS must operate on a standard or blanket COA; or a Class G notification in accordance with a using agency/FAA memorandum of agreement.
10. LOA between ATC Facilities and UA Proponents.
 - a. LOAs should be developed in accordance with the FAAO JO 7210.3., Facility Operation and Administration.
 - b. LOAs should address contingency procedures, if not contained in the COA, including but not limited to:
 - (1) Lost Link, to include flight termination points
 - (2) Flyaway
 - (3) Lost Sight of UA by the visual observer
 - (4) Other items to consider for inclusion in an LOA (if not contained in the COA):
 - (a) Any specific altitude limitations, geographic boundary limitations, preferred route assignments, and periods of operations. This information must be provided to the ATC facility involved in the LOA via graphical depiction.
 - (b) Weather requirements for operations.
 - (c) ATC facilities responsibilities.
 - (d) UAS proponent responsibilities.

Chapter 6. Part 91, COA Processing

The following provisions are limited to non-Part 107 operations that require a COA.

A. FAA Form 7711-1 Certificate of Waiver or Authorization (COA) Processing For UAS Operating Under Part 91. This section prescribes the policies, guidance, and procedures regarding COA applications for UAS operations under Part 91.

1. General.

a. Proponents requesting use of a UAS outside of restricted and warning areas must obtain a COA.

b. Applications should be submitted at least 60 business days before the proposed start of UAS operations to allow a comprehensive operation and technical review by the air traffic facility, associated service center and FAA Headquarters.

c. The proponent must submit an application for a COA using the online application system at:

Civil Operations: <https://oeaaa.faa.gov/oeaaa/external/uas/portal.jsp>

Public Operations: <https://ioeaaa.faa.gov/oeaaa/>

d. COAs must have a termination date not more than 2 years from the effective date unless renewed or extended. The COA expires on the stated termination date unless surrendered sooner by the proponent or revoked by the issuing agency.

2. Coordination.

a. When the application is received, FAA Emerging Technologies Team will conduct an initial review and include initial mitigations prior to sending the draft COA to the respective Service Center and note the application is ready for air traffic coordination.

b. The Service Center and ATC facility will determine any additional mitigations that are necessary for the Air Traffic Control Special Provisions portion of the COA.

c. Air Traffic Facility Managers must ensure any operational requirements which are necessary for the safe operation of the UA in the facility's airspace are provided so that they can be included into the COA. Examples of items to consider during the review may include, but not limited to:

(1) Impact of UAS Operating Areas on local operations.

(2) In airspace where direct two-way radio communication and/ or transponder is required, but the UA does not have one or both, the facility may determine if an alternate means of compliance is required and provide recommendation to approve or deny operations.

(3) Verify the lost link procedures will not interfere with other traffic.

(4) Any operational issues that may impact local air traffic procedures and operations.

d. Once the service center/ ATC coordination is complete, the appropriate service center will forward the draft COA back FAA HQ for final processing.

e. Once the final COA is signed, FAA HQ will send to the appropriate Service Center for distribution, who will in turn send to the air traffic control facilities and the proponent.

B. Special Governmental Interest COA Addendum Processing Under Part 91. This section prescribes the procedures regarding the processing of requests for addendums to active COAs through the expedited Special Governmental Interest (SGI) process.

1. Requests.

a. Qualifying proponents of public UAS operations must contact the System Operations Support Center (SOSC), a component of System Operations Security, at (202) 267-8276 for assistance. A backup request should be sent to the SOSC via email at 9-ator-hq-sosc@faa.gov.

b. Qualifying proponents of civil UAS operations must:

(1) secure support from a governmental entity participating in the response, relief, or recovery effort, to which the proposed UAS operations will contribute;

(2) contact the SOSC at (202) 267-8276 for assistance and

(3) send a backup request to the SOSC via email at 9-ator-hq-sosc@faa.gov

c. Requests should be initiated with the SOSC as far in advance as practicable.

d. Proponents must provide justification sufficient to show the standard COA process is not feasible. (e.g., urgent need to fly a response mission within 14 days or less).

2. Processing and Coordination.

a. Once the request is received, System Operations Security will conduct a review of the proposed operation and determine any amendments necessary to the current COA requirements (e.g., operating area, altitudes, class of airspace, transponder usage, etc.).

b. System Operations Security will determine if the request meets all necessary SGI criteria.

c. System Operations Security will coordinate with affected ATC facilities and determine and implement any needed mitigations (e.g., the application of Temporary Flight Restrictions) to reach an acceptable level of safety risk and to minimize impacts on other air traffic operations.

d. These mitigations and other authorizations, including deviations from the operator's current COA, will be implemented through COA addendum and other operational measures – e.g., coordinated ATC action and/or the application of Temporary Flight Restrictions.

e. If a determination is made to issue an addendum, System Operations Security will authorize the proposed UAS operation and distribute copies of COA addendums to the affected Service Center, affected air traffic facility and Airspace Services' UAS Tactical Operations Section.

C. Military Operations Interface Offices.

These POCs are provided for informational purposes. Direct coordination may need to occur with Military Representatives at the Service Center level. The information for Service Center level Military Representatives can be obtained by contacting the POCs below.

Military Operations Interface Offices

Branch	Address
U.S. Navy / U.S. Marine Corps	Department of the Navy Chief of Naval Operations N980A 2000 Navy Pentagon Washington, DC 20350-2000
U.S. Air Force	HQ USAF/A30-B 1480 US Air Force Pentagon Washington, DC 20330-1480
U.S. Army	Headquarters USAASA 9325 Gunston Road, Suite N319 Fort Belvoir, VA 22060-5582
U.S. Coast Guard	Headquarters COMDT (CG-711) Office of Aviation Forces 2702 Martin Luther King Jr. Ave, SE STOP 7331 Washington, DC 20593-7331

Chapter 7. Definitions

- A. **Airworthiness** – the condition in which the UAS conforms to its type certification (or military equivalent) and is in condition for safe operation.
- B. **Altitude**
1. Mean sea level “MSL”, unless otherwise specified.
 2. Flight level when preceded by “FL.”
 3. Above ground level when followed by “AGL.”
- C. **ATC Communications** – the voice or data relay of instructions or information between the UAS pilot and the air traffic controller and other NAS users, normally conducted by radio.
- D. **Autonomous** – not controlled by others or by outside forces; independent judgment.
- E. **Autonomy** – the quality of being autonomous; self-determination.
- F. **Blanket COA** – see Certificate of Waiver or Authorization
- G. **Catastrophic** – the loss of the UA, other aircraft and/or loss of life.
- H. **Certificate of Waiver or Authorization (COA)** – an FAA grant for a specific UA operation.
1. Blanket COA – A COA issued to the proponent allowing small UAS (less than 55 pounds) operations during daytime VFR conditions at specific altitudes and outside of certain distances from airports and heliports.
 2. Standard COA – A COA issued for operation that does not fit into the parameters of the Blanket.
- I. **Civil Aircraft** – aircraft other than public aircraft.
- J. **Command/Control Link** – the systems supporting the exchange of information between the ground control station and the airframe of the flight control systems.
- K. **Communication Link** – the systems supporting the communication between the pilot and ATC, other aircraft, observers, or NAS users.
- L. **Daisy Chaining** – The use of multiple, successive observers to extend the flight of a UA beyond the direct visual line-of-sight of any other PIC or VO.
- M. **Direct Visual Control** – the means by which the UA is controlled and the pilot/observer exercises see-and-avoid responsibilities.
- N. **Equivalent Level of Safety** – an evaluation of a system and/or operation to determine the acceptable risk to people and property.
- O. **Flyaway** – An interruption or loss of the control link, or when the pilot is unable to effect control of the aircraft and, as a result, the UA is not operating in a predictable or planned manner.
- P. **Ground Control Station** – the location and equipment used by a pilot.

Q. Latency – the time delay incurred between two particular interfaces (for example, data link/communications).

R. Lost Link – loss of command and control link between control station and aircraft. There are two types of link.

1. Up link – transmits command instructions to the aircraft, and
2. Down link – transmits the status of the aircraft and provides situational awareness to the pilot.

S. Model aircraft – an unmanned aircraft that is, 1) capable of sustained flight in the atmosphere; 2) Flown within visual line of sight of the person operating the aircraft; and 3) Flown for hobby or recreational purposes.

T. Observer – A trained person who assists the unmanned aircraft pilot in the duties associated with collision avoidance and navigational awareness.

U. Proponent – the person or organization responsible for the COA and operation of the UA.

V. Public Aircraft – aircraft used in operations that are inherently governmental as defined in 49 U.S.C. § 40102, 40125, and in 14 CFR, Part 1, Definitions and Abbreviations, Section 1.1, General definitions.

W. Segregation – setting apart from other activities. Segregation is not synonymous with required ATC separation standards. Therefore, segregation does not prescribe or mandate criteria such as vertical, lateral, or longitudinal distances.

X. Swarm – An operation of more than one UA in which all UAs operate in unison to commands from one PIC, who controls them all through a common link.

Y. Standard COA - See Certificate of Waiver or Authorization

Z. Special Government Issue (SGI) Addendum – A document issued to accommodate real-time application requests that will directly support emergency and law enforcement-type operations.

AA. Tethered/Moored UAS – An UA which is attached to a permanently fixed point (moored) or to a mobile platform (i.e. boat, trailer, auto or other mobile asset: tethered) which allows the UA to operate in a confined altitude, radius or both at the direction of the PIC.

BB. Unmanned Aircraft (UA) – an aircraft operated without the possibility of direct human intervention from within or on the aircraft.

CC. Unmanned Aircraft System (UAS) – an unmanned aircraft and associated elements (including communication links and the components that control the unmanned aircraft) that are required for the pilot in command to operate safely and efficiently in the national airspace system.

Appendix A: Map Design

1. UA Authorization Map Design

- a. Each facility will need three files: a facility map (.pdf), Google Earth (.kmz) file and a spreadsheet (.xls). To receive the files, send an email to: uasfm@faa.gov.
- b. The map will display the facility's airspace as defined in the JO 7400.9, Airspace Designations and Reporting Points. A latitude / longitude grid will be placed over the maps creating rectangular divisions, referred to as segments. The map will have a satellite image as its background. (See figure 1)
- c. The .kmz file is a file that opens using Google Earth Pro. It is not a requirement to use the .kmz file, but it may be easier to work with than the facility map, as you can zoom in and pan around. The facility map is a .pdf file of the .kmz. If your facility does not have Google Earth Pro, contact your IT department to get it installed. For FAA facilities, the IT support number is 1-844-322-6948.
- d. Each segment will be identified by a letter and number. The latitude segments will be labeled with letters and will increase by one for each segment (A, B, etc.). The longitude segments will be labeled with 1 and increment by one for each segment. (1, 2, etc.)
- e. Assign each segment a value of 0-400 feet, in 50 foot increments. Only evaluate segments that are within the surface area of your Class B/C/D. Leave the segments outside the surface area blank. In the event that a surrounding facility owns or abuts your surface area, you must work with that facility. (i.e. TRACON owns 1 mile from the runway.) Only complete sheet 1 of the spreadsheet, sheet 2 and sheet 3 self-populate and the data must not be changed. They will be used to develop a Google Earth graphical overlay. (See figure 2)

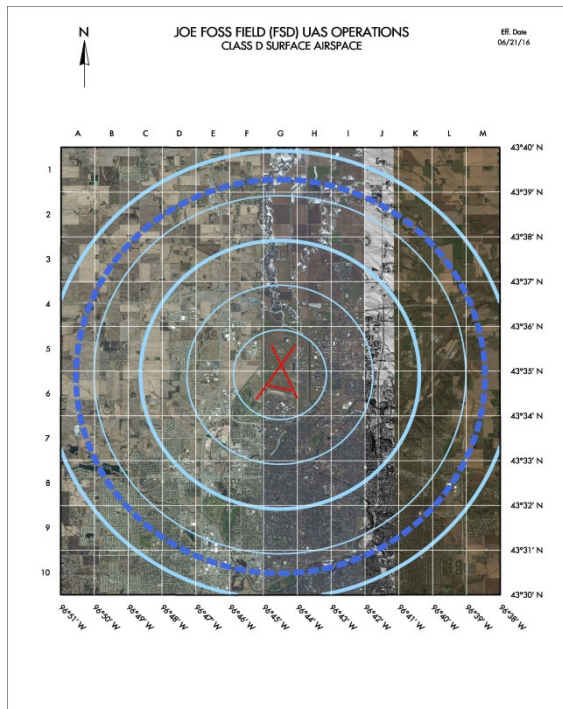


Figure 1



Figure 2

2. Authorization Map Design Procedures

a. Class B/C/D

- (1) Each facility must review the assumptions section.
- (2) Each facility will work collaboratively with their workforce to develop the UA map. Each segment must be evaluated to determine what the highest altitude a UA could operate without any coordination to the facility.
- (3) Facilities must evaluate all segments for the maximum altitude they will allow, without further coordination, within their area of jurisdiction for flights between 0 and 400 feet in 50 foot increments.
- (4) For partial segments, facilities only need to evaluate the area they have jurisdiction over, but will show the altitude for the entire segment.
- (5) For segments outside your area of jurisdiction, leave the segments on the spreadsheet blank.
- (6) In areas where the overriding rule/law specifies no UA operations (e.g. the DC FRZ), we are still asking facilities to complete the map as though operations could be permitted without the overriding regulations. There may be situations where law enforcement, DOD, etc. could ask for authorization under Part 107 and have the ability to operate in the area.
- (7) Once you have finished the spreadsheets, email them to: uasfm@faa.gov.

3. Assumptions

- a. There are portions of each facility's airspace at very low altitudes that a sUAS could operate without impacting IFR or VFR operations.
- b. Part 107 operators are not covered under Part 91 operational requirements. They are not IFR or VFR operations. There are no separation requirements and no equipment for class of airspace requirements.
- c. Evaluate each segment for the impact of the UA flight to your operation. (i.e. If a UA flew in segment A1 at 400 feet, would that effect your operation? What about 300 feet, 200 feet?)
- d. All runways are in use for arrival and departure.
- e. Altitudes will be listed in 50 foot increments, starting at 0 feet (0, 50, etc.) and ending at 400 feet. Altitudes are listed as AGL.

NOTE- Part 107 allows operators to fly 400 feet above the ground level (AGL) and if within a 400-foot radius of a structure/obstacle, they can fly to the height of the structure plus 400 feet. However, the maps will only be evaluated to 400 feet AGL. For any request above 400 feet AGL, regardless of proximity to a structure/obstacle, headquarters will coordinate with the facility.

- f. All UA operations that are requested at or below the altitude listed for the segment for where the flight will occur will be approved without facility coordination, however, the facility will receive a copy of the authorization.
- g. Zero (0) altitude means no UA flights authorized without facility coordination.
- h. For UA flights that take place in 2 or more segments, the lowest altitude will be used.
- i. When a UA operation has been approved, the affected facilities will receive an email that will include the pilots name, pilots phone number, location, altitude, time and date of UA operation.
- j. In the event two facilities overlap the same segment, the lowest altitude will be used for both facilities.
- k. Items to consider:
 - (1) Part 107 operators must comply with all parts of the Part 107 rule. (i.e. Part 107 operators must maintain visual line of site with their UA, yield right-of-way to all aircraft, they are solely responsible for not operating in prohibited or restricted areas without prior permission, they are solely responsible for not operating in temporary flight restricted (TFR) airspace and they are solely responsible for not operating over nonparticipating people.)
 - (2) Diverse vectoring areas (DVA) and aircraft performing minimum departure climbs at 200 FPM.
 - (3) Obstructions already present. (i.e. a segment with 60 foot trees would allow UA to operate safely at 50 feet)
 - (4) Low altitude operations (i.e. Helipads)
 - (5) The UA operator is solely responsible for avoiding ground hazards, sensitive areas (nuclear power plants, critical infrastructure and federal facilities) and "no drone zones."

UASFM Checklist

Request files from uasfm@faa.gov.

Complete the spreadsheet, working collaboratively. Only input information on to sheet 1. Values must be 0-400 in 50 foot increments.

Evaluate all segments that are fully or partially contained within the lateral boundary of your airspace.

Save completed worksheet as XXX.xls. Where XXX is the facility ID.

Return completed spreadsheet to uasfm@faa.gov.

Include in the email:

- Use only your facility ID in the subject line
- Attach the spreadsheet
- List your Map POC(s) (Name, Email Address, Phone)
- List your Authorization POC(s) (Name, Email Address, Phone)
- Date UASFM completed