

Appendix B—Guidance and Policy Documents

- Advisory Circular 91-57 A
- Summary of Small Unmanned Aircraft Rule (14 C.F.R. Part 107)
- Fact Sheet—State and Local Regulation of UAS
- Air Traffic Organization Policy, UAS, Order JO 7200.23
- FAA Letter on UAS Countermeasure Technology Demonstrations at Airports



U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

**Subject: Model Aircraft Operating
Standards**

**Date: September 2, 2015
Initiated by: AJV-115**

AC No. 91-57A

1. PURPOSE. This advisory circular (AC) provides guidance to persons operating Unmanned Aircraft (UA) for hobby or recreation purposes meeting the statutory definition of “model aircraft” contained in Section 336 of Public Law 112-95, the *FAA Modernization and Reform Act of 2012*. This AC describes means by which model aircraft may be operated safely in the National Airspace System (NAS). Nothing in this AC changes the requirement to comply with the statute or any applicable regulations.

2. APPLICABILITY. This AC provides information for any person who engages in model aircraft operations using model aircraft as defined by statute. (See paragraph 6.)

3. REFERENCES. Title 49 U.S.C. § 40101; P.L. 112-95 (126 Stat. 77 *et seq.*).

4. RELATED MATERIAL (current editions).

- Subtitle VII of Title 49, United States Code (49 USC)
- Title 14 of the Code of Federal Regulations (14 CFR)
- Subtitle B of Public Law 112-95 (Feb. 14, 2012)
- *Aeronautical Information Manual* (AIM)
- Temporary Flight Restriction (TFR) listing: <http://tfr.faa.gov/tfr2/list.html>
- Aeronautical Navigation Products (Charts):
http://www.faa.gov/air_traffic/flight_info/aeronav/
- Notices to Airman: https://www.faa.gov/air_traffic/publications/notices/

5. CANCELLATION. AC 91-57, *Model Aircraft Operating Standards*, dated June 9, 1981, is cancelled.

6. MODEL AIRCRAFT OPERATIONS.

a. Terminology.

- (1) 49 USC § 40102 defines an aircraft as “any contrivance invented, used, or designed to navigate, or fly in, the air.” 14 CFR § 1.1 defines an aircraft as “a device that is used or intended to be used for flight in the air.”

- (2) Public Law 112-95 defines unmanned aircraft as an aircraft that is operated without the possibility of direct human intervention from within or on the aircraft.
- (3) Section 336 of P.L. 112-95 defines a model aircraft as an unmanned aircraft that is capable of sustained flight in the atmosphere, flown within visual line of sight of the person operating the aircraft, and flown only for hobby or recreational purposes.

b. Model Aircraft Hazards in the NAS. While aero-modelers generally are concerned about safety and exercise good judgment when flying model aircraft for the hobby and recreational purposes for which they are intended, they may share the airspace in which manned aircraft are operating. Unmanned aircraft, including model aircraft, may pose a hazard to manned aircraft in flight and to persons and property on the surface if not operated safely. Model aircraft operations that endanger the safety of the National Airspace System, particularly careless or reckless operations or those that interfere with or fail to give way to any manned aircraft may be subject to FAA enforcement action.

c. Determination of “Model Aircraft” Status. Whether a given unmanned aircraft operation may be considered a “model aircraft operation” is determined with reference to section 336 of Public Law 112-95:

- (1) The aircraft is flown strictly for hobby or recreational use;
- (2) The aircraft operates in accordance with a community-based set of safety guidelines and within the programming of a nationwide community-based organization (CBO);
- (3) The aircraft is limited to not more than 55 pounds, unless otherwise certified through a design, construction, inspection, flight test, and operational safety program administered by a CBO;
- (4) The aircraft operates in a manner that does not interfere with, and gives way to, any manned aircraft; and
- (5) When flown within 5 miles of an airport, the operator of the model aircraft provides the airport operator or the airport air traffic control tower (when an air traffic facility is located at the airport) with prior notice of the operation. Model aircraft operators flying from a permanent location within 5 miles of an airport should establish a mutually agreed upon operating procedure with the airport operator and the airport air traffic control tower (when an air traffic facility is located at the airport).

d. Public Law 112-95 recognizes the authority of the Administrator to pursue enforcement action against persons operating model aircraft who endanger the safety of the National Airspace System. Accordingly, model aircraft operators must comply with any Temporary Flight Restrictions (TFR). TFRs are issued over specific locations due to disasters, or for reasons of national security; or when determined necessary for the management of air traffic

in the vicinity of aerial demonstrations or major sporting events. Do not operate model aircraft in designated areas until the TFR is no longer in force.

Model aircraft must not operate in Prohibited Areas, Special Flight Rule Areas or, the Washington National Capital Region Flight Restricted Zone, without specific authorization. Such areas are depicted on charts available at http://www.faa.gov/air_traffic/flight_info/aeronav/. Additionally, model aircraft operators should be aware of other Notices to Airmen (NOTAMS) which address operations near locations such as military or other federal facilities, certain stadiums, power plants, electric substations, dams, oil refineries, national parks, emergency, services and other industrial complexes. In addition to the previously mentioned link, information regarding published NOTAMS can be found at: https://www.faa.gov/air_traffic/publications/notices/.

The requirement to not fly within TFRs, or other circumstances where prohibited, would apply to operation of model aircraft that would otherwise comply with section 336 of Public Law 112-95.

e. Model aircraft operators should follow best practices including limiting operations to 400 feet above ground level (AGL).

f. All other operators and for additional information on Unmanned Aircraft Systems please visit: <http://www.faa.gov/uas/> .

Elizabeth L. Ray
Vice President, Mission Support Services
Air Traffic Organization

FAA News



Federal Aviation Administration, Washington, DC 20591

June 21, 2016

SUMMARY OF SMALL UNMANNED AIRCRAFT RULE (PART 107)

Operational Limitations	<ul style="list-style-type: none">• Unmanned aircraft must weigh less than 55 lbs. (25 kg).• Visual line-of-sight (VLOS) only; the unmanned aircraft must remain within VLOS of the remote pilot in command and the person manipulating the flight controls of the small UAS. Alternatively, the unmanned aircraft must remain within VLOS of the visual observer.• At all times the small unmanned aircraft must remain close enough to the remote pilot in command and the person manipulating the flight controls of the small UAS for those people to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses.• Small unmanned aircraft may not operate over any persons not directly participating in the operation, not under a covered structure, and not inside a covered stationary vehicle.• Daylight-only operations, or civil twilight (30 minutes before official sunrise to 30 minutes after official sunset, local time) with appropriate anti-collision lighting.• Must yield right of way to other aircraft.• May use visual observer (VO) but not required.• First-person view camera cannot satisfy "see-and-avoid" requirement but can be used as long as requirement is satisfied in other ways.• Maximum groundspeed of 100 mph (87 knots).• Maximum altitude of 400 feet above ground level (AGL) or, if higher than 400 feet AGL, remain within 400 feet of a structure.• Minimum weather visibility of 3 miles from control station.• Operations in Class B, C, D and E airspace are allowed with the required ATC permission.• Operations in Class G airspace are allowed without ATC permission.• No person may act as a remote pilot in command or VO for more than one unmanned aircraft operation at one time.• No operations from a moving aircraft.• No operations from a moving vehicle unless the operation is over a sparsely populated area.• No careless or reckless operations.• No carriage of hazardous materials.
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	<ul style="list-style-type: none"> • Requires preflight inspection by the remote pilot in command. • A person may not operate a small unmanned aircraft if he or she knows or has reason to know of any physical or mental condition that would interfere with the safe operation of a small UAS. • Foreign-registered small unmanned aircraft are allowed to operate under part 107 if they satisfy the requirements of part 375. • External load operations are allowed if the object being carried by the unmanned aircraft is securely attached and does not adversely affect the flight characteristics or controllability of the aircraft. • Transportation of property for compensation or hire allowed provided that- <ul style="list-style-type: none"> ◦ The aircraft, including its attached systems, payload and cargo weigh less than 55 pounds total; ◦ The flight is conducted within visual line of sight and not from a moving vehicle or aircraft; and ◦ The flight occurs wholly within the bounds of a State and does not involve transport between (1) Hawaii and another place in Hawaii through airspace outside Hawaii; (2) the District of Columbia and another place in the District of Columbia; or (3) a territory or possession of the United States and another place in the same territory or possession. • Most of the restrictions discussed above are waivable if the applicant demonstrates that his or her operation can safely be conducted under the terms of a certificate of waiver.
Remote Pilot in Command Certification and Responsibilities	<ul style="list-style-type: none"> • Establishes a remote pilot in command position. • A person operating a small UAS must either hold a remote pilot airman certificate with a small UAS rating or be under the direct supervision of a person who does hold a remote pilot certificate (remote pilot in command). • To qualify for a remote pilot certificate, a person must: <ul style="list-style-type: none"> ◦ Demonstrate aeronautical knowledge by either: <ul style="list-style-type: none"> ▪ Passing an initial aeronautical knowledge test at an FAA-approved knowledge testing center; or ▪ Hold a part 61 pilot certificate other than student pilot, complete a flight review within the previous 24 months, and complete a small UAS online training course provided by the FAA. ◦ Be vetted by the Transportation Security Administration. ◦ Be at least 16 years old. • Part 61 pilot certificate holders may obtain a temporary remote pilot certificate immediately upon submission of their application for a permanent certificate. Other applicants will obtain a temporary remote pilot certificate upon successful completion of TSA security vetting. The FAA anticipates that it will be able to issue a temporary remote pilot certificate within 10 business days after receiving a completed remote pilot certificate application. • Until international standards are developed, foreign-

	<p>certificated UAS pilots will be required to obtain an FAA-issued remote pilot certificate with a small UAS rating.</p> <p>A remote pilot in command must:</p> <ul style="list-style-type: none"> • Make available to the FAA, upon request, the small UAS for inspection or testing, and any associated documents/records required to be kept under the rule. • Report to the FAA within 10 days of any operation that results in at least serious injury, loss of consciousness, or property damage of at least \$500. • Conduct a preflight inspection, to include specific aircraft and control station systems checks, to ensure the small UAS is in a condition for safe operation. • Ensure that the small unmanned aircraft complies with the existing registration requirements specified in § 91.203(a)(2). <p>A remote pilot in command may deviate from the requirements of this rule in response to an in-flight emergency.</p>
Aircraft Requirements	<ul style="list-style-type: none"> • FAA airworthiness certification is not required. However, the remote pilot in command must conduct a preflight check of the small UAS to ensure that it is in a condition for safe operation.
Model Aircraft	<ul style="list-style-type: none"> • Part 107 does not apply to model aircraft that satisfy all of the criteria specified in section 336 of Public Law 112-95. • The rule codifies the FAA's enforcement authority in part 101 by prohibiting model aircraft operators from endangering the safety of the NAS.

State and Local Regulation of Unmanned Aircraft Systems (UAS)
Fact Sheet

Federal Aviation Administration
Office of the Chief Counsel

December 17, 2015

BACKGROUND

Unmanned aircraft systems (UAS) are aircraft subject to regulation by the FAA to ensure safety of flight, and safety of people and property on the ground. States and local jurisdictions are increasingly exploring regulation of UAS or proceeding to enact legislation relating to UAS operations. In 2015, approximately 45 states have considered restrictions on UAS. In addition, public comments on the Federal Aviation Administration's (FAA) proposed rule, "Operation and Certification of Small Unmanned Aircraft Systems" (Docket No. FAA-2015-0150), expressed concern about the possible impact of state and local laws on UAS operations.

Incidents involving unauthorized and unsafe use of small, remote-controlled aircraft have risen dramatically. Pilot reports of interactions with suspected unmanned aircraft have increased from 238 sightings in all of 2014 to 780 through August of this year. During this past summer, the presence of multiple UAS in the vicinity of wild fires in the western U.S. prompted firefighters to ground their aircraft on several occasions.

This fact sheet is intended to provide basic information about the federal regulatory framework for use by states and localities when considering laws affecting UAS. State and local restrictions affecting UAS operations should be consistent with the extensive federal statutory and regulatory framework pertaining to control of the airspace, flight management and efficiency, air traffic control, aviation safety, navigational facilities, and the regulation of aircraft noise at its source.

Presented below are general principles of federal law as they relate to aviation safety, and examples of state and local laws that should be carefully considered prior to any legislative action to ensure that they are consistent with applicable federal safety regulations. The FAA's Office of the Chief Counsel is available for consultation on specific questions.

WHY THE FEDERAL FRAMEWORK

Congress has vested the FAA with authority to regulate the areas of airspace use, management and efficiency, air traffic control, safety, navigational facilities, and aircraft noise at its source. 49 U.S.C. §§ 40103, 44502, and 44701-44735. Congress has directed the FAA to "develop plans and policy for the use of the navigable airspace and assign by regulation or order the use of the airspace necessary to ensure the safety of aircraft and the efficient use of airspace." 49 U.S.C. § 40103(b)(1). Congress has further directed the FAA to "prescribe air traffic regulations on the flight of aircraft (including regulations on safe altitudes)" for navigating, protecting, and identifying aircraft; protecting individuals and property on the ground; using the navigable

airspace efficiently; and preventing collision between aircraft, between aircraft and land or water vehicles, and between aircraft and airborne objects. 49 U.S.C. § 40103(b)(2).

A consistent regulatory system for aircraft and use of airspace has the broader effect of ensuring the highest level of safety for all aviation operations. To ensure the maintenance of a safe and sound air transportation system and of navigable airspace free from inconsistent restrictions, FAA has regulatory authority over matters pertaining to aviation safety.

REGULATING UAS OPERATIONS

In § 333 of the FAA Modernization and Reform Act of 2012 (Public Law No. 112-95), Congress directed the Secretary to determine whether UAS operations posing the least amount of public risk and no threat to national security could safely be operated in the national airspace system (NAS) and if so, to establish requirements for the safe operation of these systems in the NAS.

On February 15, 2015, the FAA proposed a framework of regulations that would allow routine commercial use of certain small UAS in today's aviation system, while maintaining flexibility to accommodate future technological innovations. The FAA's Notice of Proposed Rulemaking offered safety rules for small UAS (under 55 pounds) conducting non-recreational or non-hobby operations. The proposed rule defines permissible hours of flight, line-of-sight observation, altitude, operator certification, optional use of visual observers, aircraft registration and marking, and operational limits.

Consistent with its statutory authority, the FAA is requiring Federal registration of UAS in order to operate a UAS. Registering UAS will help protect public safety in the air and on the ground, aid the FAA in the enforcement of safety-related requirements for the operation of UAS, and build a culture of accountability and responsibility among users operating in U.S. airspace. No state or local UAS registration law may relieve a UAS owner or operator from complying with the Federal UAS registration requirements. Because Federal registration is the exclusive means for registering UAS for purposes of operating an aircraft in navigable airspace, no state or local government may impose an additional registration requirement on the operation of UAS in navigable airspace without first obtaining FAA approval.

Substantial air safety issues are raised when state or local governments attempt to regulate the operation or flight of aircraft. If one or two municipalities enacted ordinances regulating UAS in the navigable airspace and a significant number of municipalities followed suit, fractionalized control of the navigable airspace could result. In turn, this 'patchwork quilt' of differing restrictions could severely limit the flexibility of FAA in controlling the airspace and flight patterns, and ensuring safety and an efficient air traffic flow. A navigable airspace free from inconsistent state and local restrictions is essential to the maintenance of a safe and sound air transportation system. See *Montalvo v. Spirit Airlines*, 508 F.3d 464 (9th Cir. 2007), and *French v. Pan Am Express, Inc.*, 869 F.2d 1 (1st Cir. 1989); see also *Arizona v. U.S.*, 567 U.S. ___, 132 S.Ct. 2492, 2502 (2012) ("Where Congress occupies an entire field . . . even complimentary state regulation is impermissible. Field preemption reflects a congressional decision to foreclose any

state regulation in the area, even if it is parallel to federal standards.”), and *Morales v. Trans World Airlines, Inc.*, 504 U.S. 374, 386-87 (1992).

EXAMPLES OF STATE AND LOCAL LAWS FOR WHICH CONSULTATION WITH THE FAA IS RECOMMENDED

- Operational UAS restrictions on flight altitude, flight paths; operational bans; any regulation of the navigable airspace. For example – a city ordinance banning anyone from operating UAS within the city limits, within the airspace of the city, or within certain distances of landmarks. Federal courts strictly scrutinize state and local regulation of overflight. *City of Burbank v. Lockheed Air Terminal*, 411 U.S. 624 (1973); *Skysign International, Inc. v. City and County of Honolulu*, 276 F.3d 1109, 1117 (9th Cir. 2002); *American Airlines v. Town of Hempstead*, 398 F.2d 369 (2d Cir. 1968); *American Airlines v. City of Audubon Park*, 407 F.2d 1306 (6th Cir. 1969).
- Mandating equipment or training for UAS related to aviation safety such as geo-fencing would likely be preempted. Courts have found that state regulation pertaining to mandatory training and equipment requirements related to aviation safety is not consistent with the federal regulatory framework. *Med-Trans Corp. v. Benton*, 581 F. Supp. 2d 721, 740 (E.D.N.C. 2008); *Air Evac EMS, Inc. v. Robinson*, 486 F. Supp. 2d 713, 722 (M.D. Tenn. 2007).

EXAMPLES OF STATE AND LOCAL LAWS WITHIN STATE AND LOCAL GOVERNMENT POLICE POWER

Laws traditionally related to state and local police power – including land use, zoning, privacy, trespass, and law enforcement operations – generally are not subject to federal regulation. *Skysign International, Inc. v. City and County of Honolulu*, 276 F.3d 1109, 1115 (9th Cir. 2002). Examples include:

- Requirement for police to obtain a warrant prior to using a UAS for surveillance.
- Specifying that UAS may not be used for voyeurism.
- Prohibitions on using UAS for hunting or fishing, or to interfere with or harass an individual who is hunting or fishing.
- Prohibitions on attaching firearms or similar weapons to UAS.

CONTACT INFORMATION FOR QUESTIONS

The FAA’s Office of the Chief Counsel is available to answer questions about the principles set forth in this fact sheet and to consult with you about the intersection of federal, state, and local regulation of aviation, generally, and UAS operations, specifically. You may contact the Office of Chief Counsel in Washington, D.C. or any of the following Regional Counsels:

FAA Office of the Chief Counsel
Regulations Division (AGC-200)
800 Independence Ave. SW
Washington, DC 20591
(202) 267-3073

Central Region
Office of the Regional Counsel
901 Locust St., Room 506
Kansas City, MO 64106-2641
(816) 329-3760
(IA, KS, MO, NE)

Great Lakes Region
Office of the Regional Counsel
O'Hare Lake Office Center
2300 East Devon Ave.
Des Plaines, IL 60018
(847) 294-7313
(IL, IN, MI, MN, ND, OH, SD, WI)

Northwest Mountain Region
Office of the Regional Counsel
1601 Lind Ave. SW
Renton, WA 98055-4056
(425) 227-2007
(CO, ID, MT, OR, UT, WA, WY)

Southwest Region
Office of the Regional Counsel, 6N-300
10101 Hillwood Parkway Dr.
Fort Worth, TX 76177
(817) 222-5099
(AR, LA, NM, OK, TX)

Alaskan Region
Office of the Regional Counsel
222 West 7th Ave.
Anchorage, AK 99513
(907) 271-5269
(AK)

Eastern Region
Office of the Regional Counsel
1 Aviation Plaza, Room 561
Jamaica, NY 11434-4848
(718) 553-3285
(DC, DE, MD, NJ, NY, PA, VA, WV)

New England Region
Office of the Regional Counsel
12 New England Executive Park
Burlington, MA 01803
(781) 238-7040
(CT, ME, MA, NH, RI, VT)

Southern Region
Office of the Regional Counsel
1701 Columbia Ave., Suite 530
College Park, GA 30337
(404) 305-5200
(AL, FL, GA, KY, MS, NC, SC, TN)

Western-Pacific Region
Office of the Regional Counsel
P.O. Box 92007
Los Angeles, CA 90009
(310) 725-7100
(AZ, CA, HI, NV)

APPENDIX – LIST OF AUTHORITIES

Federal Statutes

- 49 U.S.C. §§ 40103, 44502, and 44701- 44735 (former Federal Aviation Act of 1958, as amended and recodified).
- FAA Modernization and Reform Act of 2012, Public Law No. 112-95 (Feb. 14, 2012), Subtitle B, “Unmanned Aircraft Systems.”

Federal Regulations

- Title 14 of the Code of Federal Regulations, Chapter 1.

The U.S. Supreme Court

- “Congress has recognized the national responsibility for regulating air commerce. Federal control is intensive and exclusive. Planes do not wander about in the sky like vagrant clouds. They move only by federal permission, subject to federal inspection, in the hands of federally certified personnel and under an intricate system of federal commands. The moment a ship taxis onto a runway it is caught up in an elaborate and detailed system of controls. It takes off only by instruction from the control tower, it travels on prescribed beams, it may be diverted from its intended landing, and it obeys signals and orders. Its privileges, rights, and protection, so far as transit is concerned, it owes to the Federal Government alone and not to any state government.” *Northwest Airlines v. State of Minnesota*, 322 U.S. 292, 303 (1944)(Jackson, R., concurring).
- “If we were to uphold the Burbank ordinance [which placed an 11 p.m. to 7 a.m. curfew on jet flights from the Burbank Airport] and a significant number of municipalities followed suit, it is obvious that fractionalized control of the timing of takeoffs and landings would severely limit the flexibility of FAA in controlling air traffic flow. The difficulties of scheduling flights to avoid congestion and the concomitant decrease in safety would be compounded.” *Burbank v. Lockheed Air Terminal Inc.*, 411 U.S. 624, 639 (1973).
- “The Federal Aviation Act requires a delicate balance between safety and efficiency, and the protection of persons on the ground ... The interdependence of these factors requires a uniform and exclusive system of federal regulation if the congressional objectives underlying the Federal Aviation Act are to be fulfilled.” *Burbank* at 638-639.
- “The paramount substantive concerns of Congress [in enacting the FAA Act] were to regulate federally all aspects of air safety ... and, once aircraft were in ‘flight,’ airspace management....” *Burbank* at 644 (Rehnquist, J. dissenting).

U.S. Courts of Appeals

- “Air traffic must be regulated at the national level. Without uniform equipment specifications, takeoff and landing rules, and safety standards, it would be impossible to operate a national air transportation system.” *Gustafson v. City of Lake Angeles*, 76 F.3d 778, 792-793 (6th Cir. 1996)(Jones, N., concurring).
- “The purpose, history, and language of the FAA [Act] lead us to conclude that Congress intended to have a single, uniform system for regulating aviation safety. The catalytic events leading to the enactment of the FAA [Act] helped generate this intent. The FAA [Act] was drafted in response to a series of fatal air crashes between civil and military aircraft operating under separate flight rules In discussing the impetus for the FAA [Act], the Supreme Court has also noted that regulating the aviation industry requires a delicate balance between safety and efficiency. It is precisely because of ‘the interdependence of these factors’ that Congress enacted ‘a uniform and exclusive system of federal regulation.’” *Montalvo v. Spirit Airlines*, 508 F.3d 464, 471 (9th Cir. 2007), citing *City of Burbank v. Lockheed Air Terminal Inc.*, 411 U.S. 624, 638-39 (1973).
- “[W]hen we look to the historical impetus for the FAA, its legislative history, and the language of the [FAA] Act, it is clear that Congress intended to invest the Administrator of the Federal Aviation Administration with the authority to enact exclusive air safety standards. Moreover, the Administrator has chosen to exercise this authority by issuing such pervasive regulations that we can infer a preemptive intent to displace all state law on the subject of air safety.” *Montalvo* at 472.
- “We similarly hold that federal law occupies the entire field of aviation safety. Congress' intent to displace state law is implicit in the pervasiveness of the federal regulations, the dominance of the federal interest in this area, and the legislative goal of establishing a single, uniform system of control over air safety. This holding is fully consistent with our decision in *Skysign International, Inc. v. Honolulu*, 276 F.3d 1109 (9th Cir. 2002), where we considered whether federal law preempted state regulation of aerial advertising that was distracting and potentially dangerous to persons on the ground. In upholding the state regulations, we held that federal law has not ‘preempt[ed] altogether any state regulation purporting to reach into the navigable airspace.’ *Skysign* at 1116. While Congress may not have acted to occupy exclusively all of air commerce, it has clearly indicated its intent to be the sole regulator of aviation safety. The FAA, together with federal air safety regulations, establish complete and thorough safety standards for interstate and international air transportation that are not subject to supplementation by, or variation among, states.” *Montalvo* at 473-474.
- “[W]e remark the Supreme Court's reasoning regarding the need for uniformity [concerning] the regulation of aviation noise, see *City of Burbank v. Lockheed Air Terminal*, 411 U.S. 624 (1973), and suggest that the same rationale applies here. In *Burbank*, the Court struck down a municipal anti-noise ordinance placing a curfew on jet flights from a regional airport. Citing the ‘pervasive nature of the scheme of federal

regulation,’ the majority ruled that aircraft noise was wholly subject to federal hegemony, thereby preempting state or local enactments in the field. In our view, the pervasiveness of the federal web is as apparent in the matter of pilot qualification as in the matter of aircraft noise. If we upheld the Rhode Island statute as applied to airline pilots, ‘and a significant number of [states] followed suit, it is obvious that fractionalized control ... would severely limit the flexibility of the F.A.A’ [citing *Burbank*] Moreover, a patchwork of state laws in this airspace, some in conflict with each other, would create a crazyquilt effect ... The regulation of interstate flight-and flyers-must of necessity be monolithic. Its very nature permits no other conclusion. In the area of pilot fitness as in the area of aviation noise, the [FAA] Act as we read it ‘leave[s] no room for ... local controls.’ [citing *Burbank*]. *French v. Pan Am Express, Inc.*, 869 F.2d 1, 6 (1st Cir. 1989).



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

Heather Hemdal,
Director, Air Traffic Procedures
Air Traffic Organization

Date Signed

Distribution: ZAT-721; ZAT-464

Initiated By: AJV-115
Emerging Technologies Team

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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)

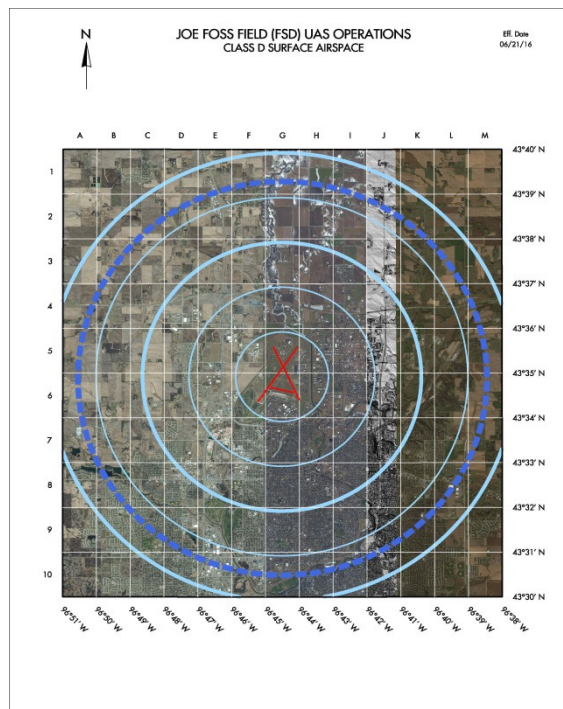


Figure 1



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



U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of Airports Safety and Standards

800 Independence Ave., SW
Washington, DC 20591

October 26, 2016

Dear Airport Sponsor:

This letter provides guidance on Unmanned Aircraft Systems (UAS) Detection and Countermeasures Technology Demonstrations / Evaluations at airports.

Background: The United States Congress charged the Federal Aviation Administration (FAA), under Section 2206 of Public Law 114-190 (July 15, 2016), to “establish a pilot program for airspace hazard mitigation at airports and other critical infrastructure using unmanned aircraft detection systems” in cooperation with the Department of Defense (DOD), Department of Homeland Security (DHS) and other federal agencies. After completion of the pilot program, the FAA “may use unmanned aircraft detection systems to detect and mitigate the unauthorized operation of an unmanned aircraft that poses a risk to aviation safety.” In addition, recognizing the FAA’s long-standing authority, Section 2206 requires consultation with the heads of other agencies to “ensure that technologies that are developed, tested, or deployed by [other agencies] to mitigate threats posed by errant or hostile unmanned aircraft system operations do not adversely impact or interfere with safe airport operations, navigation, air traffic services, or the safe and efficient operation of the national airspace system.”

The FAA UAS Integration Office is working through Cooperative Research and Development Agreements (CRDAs) with UAS detection manufacturers to evaluate the small UAS detection and identification capabilities, using different methodologies and systems on and near airports. The FAA is also partnering with DHS, DOD and other federal agencies interested in this research, as outlined in Section 2206. These activities have taken place at selected airports around the country, and the agencies are planning additional evaluations later this year and next year.

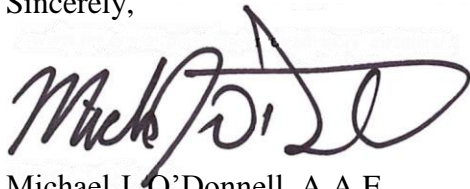
Issue: Recently, technology vendors contacted several U.S. airports, proposing to conduct demonstrations and evaluations of their UAS detection and counter measure systems at those airports. In some cases, the airport sponsors did not coordinate these assessments and demonstrations with the FAA in advance. It is important that federally obligated airports understand that the FAA has not authorized any UAS detection or counter measure assessments at any airports other than those participating in the FAA’s UAS detection program through a CRDA, and airports allowing such evaluations could be in violation of their grant assurances.

Unauthorized UAS detection and counter measure deployments can create a host of problems, such as electromagnetic and Radio Frequency (RF) interference affecting safety of flight and air traffic management issues. Additionally, current law may impose barriers to the evaluation and deployment of certain unmanned aircraft detection and mitigation technical capabilities by most federal agencies, as well as state and local entities and private individuals. There are a number of federal laws to consider, including those that prohibit destruction or endangerment of aircraft and others that restrict or prohibit electronic surveillance, including the collection, recording or decoding of signaling information and the interception of electronic communications content.

Any federally obligated airport that is contacted by a vendor requesting to demonstrate evaluate and deploy any UAS detection or counter measure technology on or near the airport should first contact their local FAA Airport District Office (ADO) before entering into any agreement to conduct UAS detection or counter measure evaluations or demonstrations at their airport. The ADO will then work with the FAA Office of Airport Safety and Standards and the FAA UAS Integration Office to provide a timely response to the airport.

Further information on the FAA's UAS detection efforts can be found at:
https://www.faa.gov/uas/programs_partnerships/uas_detection_initiative/

Sincerely,

A handwritten signature in dark ink, appearing to read "Michael J. O'Donnell", with a stylized flourish at the end.

Michael J. O'Donnell, A.A.E.
Director of Airport Safety
and Standards