

# Unmanned Aircraft Systems

Unmanned aircraft are rapidly becoming major users of the national airspace system. The purpose of this document is to provide a brief overview of federal and state rules, laws, and court cases pertaining to the operation of unmanned aircraft. In addition, the different categories of unmanned aircraft operations, operating limitations, and possible penalties are discussed. Finally, a discussion of best practices for airport operators is included.

It is important to note that the rules and regulations pertaining to unmanned aircraft continue to change frequently. The information provided in this document is only as current as the date provided at the bottom of the page. For the most up to date information contact the Bureau of Aeronautics or Federal Aviation Administration directly.

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## Contents

Definitions.....	2
Federal Court Cases, Laws, & Regulations.....	2
NTSB Huerta v. Pirker Decision.....	2
Public Law 112-95 <i>FAA Modernization and Reform Act of 2012</i> .....	3
Section 332 <i>Integration of Civil Unmanned Aircraft Systems into National Airspace System</i> .....	3
Section 333 <i>Special Rules for Certain Unmanned Aircraft Systems</i> .....	3
Section 334 <i>Public Unmanned Aircraft Systems</i> .....	3
Section 336 <i>Special Rules for Model Aircraft</i> .....	3
FAA Advisory Circular AC 91-57A Model Aircraft Operating Standards.....	4
Wisconsin Laws.....	4
2013 Wisconsin Act 213.....	4
Wisconsin State Statute Chapter 114 Aeronautics and Astronautics.....	5
Public UAS Operations (Governmental).....	5
Civil UAS Operations (Commercial).....	6
Section 333 Exemption.....	6
Certification of Waiver or Authorization (COA).....	9
Airport Coordination Requirements.....	10
Aircraft Registration.....	10
Example Letter of Agreement.....	11
Proposed Small UAS Rulemaking.....	12
Model Aircraft (Recreational/Hobby).....	13
Airport Notification Requirements.....	15
Model/Recreational UAS Registration.....	15
Penalties.....	15
Example Airport Notification Form.....	16
Helpful Links.....	17

## Definitions

**Aircraft** - any contrivance invented, used, or designed to navigate, or fly in, the air. Both the federal government and State of Wisconsin recognize all unmanned aircraft as aircraft.

**Civil UAS Operations** – any operation of an unmanned aircraft that is not considered a model aircraft or a public UAS operation. Typically civil UAS operations include UAS flown for compensation or as part of a business activity.

**Model Aircraft** – unmanned aircraft flown for recreational or hobby use only. An unmanned aircraft flown for compensation cannot be considered a model aircraft. Model aircraft are also restricted to less than 55lbs unless otherwise exempt.

**National Airspace System (NAS)** - the airspace, navigation facilities and airports of the United States along with their associated information, services, rules, regulations, policies, procedures, personnel and equipment.

**Public UAS Operations** – any operation of an unmanned aircraft by a government agency such as the federal government, a state government or any other political subdivision of the United States.

**Unmanned Aircraft System (UAS)** - the unmanned aircraft and all of the associated support equipment, control station, data links, telemetry, communications and navigation equipment, etc., necessary to operate the unmanned aircraft. Also known as drones, UAVs, and model aircraft.

## Federal Court Cases, Laws, & Regulations

### [NTSB Huerta v. Pirker Decision](#)

In June 2013, the FAA sought to assess Raphael Pirker a civil penalty of \$10,000 for operating a UAS in a reckless and careless manner. The FAA alleged Mr. Pirker remotely piloted an unmanned aircraft in a series of maneuvers around the University of Virginia campus. In the complaint, the FAA asserted Mr. Pirker operated the aircraft directly towards an individual causing the individual to take immediate evasive maneuvers so as to avoid being struck by the aircraft; through a tunnel containing moving vehicles; under a crane; below tree top level over a tree lined walkway; under an elevated pedestrian walkway; and within approximately 100 feet of an active heliport. Mr. Pirker was allegedly compensated for these maneuvers by a third party to who hired Mr. Pirker to supply aerial photographs and video of the UVA campus and medical center.

The National Transportation Safety Board (NTSB) concluded that unmanned aircraft systems are:

- (1) "Aircraft" within the FAA's statutory and regulatory definitions; and
- (2) Prohibited from operation in a careless and reckless manner under FAA regulations.

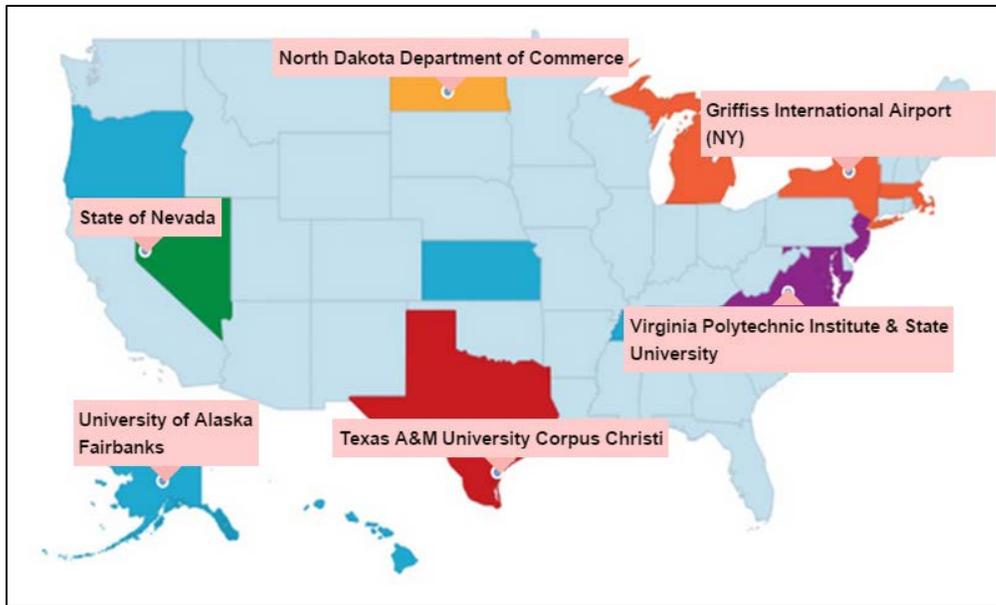
The NTSB's decision firmly establishes that both recreational and commercial UAS operators must abide by §91.13(a)'s safety mandate. In addition, FAA may assess civil penalties for operating an unmanned aircraft in a careless and reckless manner.

[Public Law 112-95 FAA Modernization and Reform Act of 2012](#)

The FAA Modernization and Reform Act of 2012 serves as the legislative basis for many of the existing FAA rules and policies relating to unmanned aircraft. The unmanned aircraft portions of the law are split into four pertinent sections as follows:

*Section 332 Integration of Civil Unmanned Aircraft Systems into National Airspace System*

Section 332 requires FAA to develop a comprehensive plan and to safely accelerate the integration of civil unmanned aircraft into the national airspace system. As part of this effort, FAA was tasked with establishing 6 test ranges. The following map illustrates the locations of these test ranges.



*Section 333 Special Rules for Certain Unmanned Aircraft Systems*

Section 333 allows for FAA to approve the use of some civil unmanned aircraft systems prior to the completion and implementation of the plan discussed under Section 332. Such approvals shall be based on the type of unmanned aircraft system, proximity to airports and populated areas, and operations within visual line of sight so as to not create a hazard to users of the national airspace system or the general public.

*Section 334 Public Unmanned Aircraft Systems*

Section 334 tasks FAA with the development of operational and certification requirements for the use of unmanned aircraft systems in the national airspace system operated by government agencies.

*Section 336 Special Rules for Model Aircraft*

Section 336 does not allow for FAA to regulate aircraft flown as model aircraft, if:

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.

“Model aircraft” means 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 for hobby or recreational purposes.

### [FAA Advisory Circular AC 91-57A Model Aircraft Operating Standards](#)

This advisory circular provides guidance to persons operating unmanned aircraft for hobby or recreation purposes meeting the statutory definition of “model aircraft” contained in Section 336 Public Law 112-95.

Public Law 112-95 recognizes the authority of the FAA to pursue enforcement action against operators of model aircraft who endanger the safety of the National Airspace System. Accordingly, model aircraft operators must comply with any Temporary Flight Restrictions (TFR). In addition, model aircraft must not operate in Prohibited Areas, Special Flight Rule Areas or, the Washington National Capital Region Flight Restricted Zone, without specific authorization. Finally, 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.

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

## Wisconsin Laws

### [2013 Wisconsin Act 213](#)

In April 2014, Wisconsin Act 213 was adopted which included several changes, clarifications, and additions to state law. Among the most important clarification was that unmanned aircraft meet the definition of an aircraft under state law. Therefore, all state statutes applying to manned aircraft also apply to unmanned aircraft. Specifically:

- The flight of aircraft over the lands and waters of this state is lawful, unless:
  - o At such a low altitude as to interfere with the then existing use to which the land or water, or the space over the land or water; or
  - o So conducted as to be imminently dangerous or damaging to persons or property lawfully on the land or water beneath.
- The landing of an aircraft on the lands or waters of another, without the person's consent, is unlawful, except in the case of a forced landing.
- No person may operate an aircraft in the air or on the ground or water while under the influence of intoxicating liquor or controlled substances to a degree which renders him or her incapable of safely operating an aircraft.

- No person may operate an aircraft in the air or on the ground if the person has a prohibited alcohol concentration (0.04).
- No person may operate an aircraft in the air or on the ground or water in a careless or reckless manner so as to endanger the life or property of another. In determining whether the operation was careless or reckless the court shall consider the standards for safe operation of aircraft prescribed by federal statutes or regulations governing aeronautics.

Additions specific to unmanned aircraft (referred to as a drone) include:

- No Wisconsin law enforcement agency may use a drone to gather evidence or other information in a criminal investigation from or at a place or location where an individual has a reasonable expectation of privacy without first obtaining a search warrant.
- Whoever operates any weaponized drone is guilty of a Class H felony.
- Whoever uses a drone with the intent to photograph, record, or otherwise observe another individual in a place or location where the individual has a reasonable expectation of privacy is guilty of Class A misdemeanor.

### [Wisconsin State Statute Chapter 114 Aeronautics and Astronautics](#)

Chapter 114 preempts Wisconsin counties and municipalities from enacting local ordinances controlling the flight of aircraft in the sky. This includes the flight of unmanned aircraft. However, state law does not preempt a Wisconsin county or municipality from adopting an ordinance which prohibits the landing or taking off of aircraft in certain locations.

### Public UAS Operations (Governmental)

Public UAS operations encompass all governmental uses of unmanned aircraft. Common public uses today include law enforcement, firefighting, border patrol, disaster relief, search and rescue, military training, and other government operational missions.

In order for a public agency to operate a UAS, the FAA must issue a Certificate of Waiver or Authorization (COA). A COA permits a particular public agency the approval to operate a particular aircraft, for a particular purpose, in a particular area, and for a specific time period - up to two years in many cases.

A COA for a public UAS operation typically allows the public agency to use a defined block of airspace and includes special safety provisions unique to the proposed operation. The FAA works with the public agency to develop conditions and limitations for UAS operations to ensure they do not jeopardize the safety of other aviation operations. The objective is to issue a COA with parameters that ensure a level of safety equivalent to manned aircraft. Usually, this entails making sure that the UAS does not operate in a populated area and that the aircraft is observed, either by someone in a manned aircraft or someone on the ground to ensure separation from other aircraft in accordance with right-of-way rules.



## Civil UAS Operations (Commercial)

Any UAS operation for compensation or conducted as part of a business activity that is not being conducted by a public agency is considered a civil UAS operation. Common civil UAS uses today include aerial photography, aerial videography, surveying, mapping, and visual inspections. Companies like Amazon.com have also begun developing UAS to deliver packages.



All civil UAS operations require two-part FAA authorization.

1. Section 333 Exemption
2. Certificate of Waiver or Authorization (COA)

### Section 333 Exemption

A Section 333 exemption refers to Section 333 of Public Law 112-95 FAA Modernization and Reform Act of 2012 which allows FAA to grant authorization to some civil UAS operators prior to the completion and implementation of FAA's full UAS integration plan. In actuality, a Section 333 exemption exempts an operator from specific Sections of Title 14 (Aeronautics and Space) of the Code of Federal Regulations (CFR).

Section 333 exemptions can be issued to both individuals and companies. Like the public UAS operators, Section 333 exemptions are for the use of a particular aircraft for specific activities. Examples activities include aerial photography, aerial videography, surveying, mapping, visual inspections, etc. In some cases, a Section 333 exemption may authorize the operator to conduct a single type of activity or many of these activities.

A petition for exemption should be filed with FAA no less than 120 days before the exemption is needed. The following information must be submitted in the petition:

1. Operator's name and address;
2. The specific regulations (CFRs) from which relief is required;
3. How the operator will maintain an equivalent level of safety or no adverse impact to safety;
4. How granting the exemption would be in the public interest;
5. The proposed operations; and
6. The make and model of aircraft for the proposed operations.

Based upon the characteristics of the request for Section 333 exemption, FAA will develop a list of conditions and limitations for the operator. The operator must then adhere to these conditions and limitations during all operations. Typical conditions and limitations include:

1. **Operations authorized by this grant of exemption are limited to (specific make and model aircraft) when weighing less than 55 pounds including payload.** Proposed operations of any other unmanned aircraft (UA) will require a new petition or a petition to amend this exemption.
2. Operations for the purpose of closed-set motion picture and television filming are not permitted.

3. **The UA may not be operated at a speed exceeding 87 knots (100 miles per hour).** The exemption holder may use either groundspeed or calibrated airspeed to determine compliance with the 87 knot speed restriction. In no case will the UA be operated at airspeeds greater than the maximum UA operating airspeed recommended by the aircraft manufacturer.
4. **The UA must be operated at an altitude of no more than 400 feet above ground level (AGL).** Altitude must be reported in feet AGL.
5. **The UA must be operated within visual line of sight (VLOS) of the PIC at all times.** This requires the PIC to be able to use human vision unaided by any device other than corrective lenses, as specified on the PIC's FAA-issued airman medical certificate or U.S. driver's license.
6. **All operations must utilize a visual observer (VO).** The UA must be operated within the visual line of sight (VLOS) of the PIC and VO at all times. The VO may be used to satisfy the VLOS requirement as long as the PIC always maintains VLOS capability. The VO and PIC must be able to communicate verbally at all times; electronic messaging or texting is not permitted during flight operations. The PIC must be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC must ensure that the VO can perform the duties required of the VO.
7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operating documents, the conditions and limitations herein take precedence and must be followed. Otherwise, the operator must follow the procedures as outlined in its operating documents. The operator may update or revise its operating documents. It is the operator's responsibility to track such revisions and present updated and revised documents to the Administrator or any law enforcement official upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to this grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted this exemption, then the operator must petition for an amendment to its grant of exemption. The FAA's UAS Integration Office (AFS-80) may be contacted if questions arise regarding updates or revisions to the operating documents.
8. Any UAS that has undergone maintenance or alterations that affect the UAS operation or flight characteristics, e.g., replacement of a flight critical component, must undergo a functional test flight prior to conducting further operations under this exemption. Functional test flights may only be conducted by a PIC with a VO and must remain at least 500 feet from other people. The functional test flight must be conducted in such a manner so as to not pose an undue hazard to persons and property.
9. The operator is responsible for maintaining and inspecting the UAS to ensure that it is in a condition for safe operation.
10. **Prior to each flight, the PIC must conduct a pre-flight inspection and determine the UAS is in a condition for safe flight.** The pre-flight inspection must account for all potential discrepancies, e.g., inoperable components, items, or equipment. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the

necessary maintenance has been performed and the UAS is found to be in a condition for safe flight.

11. The operator must follow the UAS manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components.
12. Each UAS operated under this exemption must comply with all manufacturer safety bulletins
13. **Under this grant of exemption, a PIC must hold either an airline transport, commercial, private, recreational, or sport pilot certificate. The PIC must also hold a current FAA airman medical certificate or a valid U.S. driver's license** issued by a state, the District of Columbia, Puerto Rico, a territory, a possession, or the Federal government. The PIC must also meet the flight review requirements specified in 14 CFR § 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.
14. **The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption**, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with 14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However, training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.
15. **UAS operations may not be conducted during night, as defined in 14 CFR § 1.1. All operations must be conducted under visual meteorological conditions (VMC).** Flights under special visual flight rules (SVFR) are not authorized.
16. **The UA may not operate within 5 nautical miles of an airport** reference point (ARP) as denoted in the current FAA Airport/Facility Directory (AFD) or for airports not denoted with an ARP, the center of the airport symbol as denoted on the current FAA-published aeronautical chart, unless a letter of agreement with that airport's management is obtained or otherwise permitted by a COA issued to the exemption holder. The letter of agreement with the airport management must be made available to the Administrator or any law enforcement official upon request.
17. **The UA may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.**
18. **If the UAS loses communications or loses its GPS signal, the UA must return to a pre-determined location within the private or controlled-access property.**
19. **The PIC must abort the flight in the event of unpredicted obstacles or emergencies.**
20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is **enough available power for the UA to conduct the intended operation and to operate after that for at least five minutes or with the reserve power recommended by the manufacturer if greater.**
21. Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA). All operations shall be conducted in accordance with an ATO-issued COA. The exemption holder may apply for a

new or amended COA if it intends to conduct operations that cannot be conducted under the terms of the attached COA.

22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification (N-Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.
23. Documents used by the operator to ensure the safe operation and flight of the UAS and any documents required under 14 CFR §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.
24. **The UA must remain clear and give way to all manned aviation operations and activities at all times.**
25. **The UAS may not be operated by the PIC from any moving device or vehicle.**
26. **All Flight operations must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures** unless:
  - a. Barriers or structures are present that sufficiently protect nonparticipating persons from the UA and/or debris in the event of an accident. The operator must ensure that nonparticipating persons remain under such protection. If a situation arises where nonparticipating persons leave such protection and are within 500 feet of the UA, flight operations must cease immediately in a manner ensuring the safety of nonparticipating persons; and
  - b. The owner/controller of any vessels, vehicles or structures has granted permission for operating closer to those objects and the PIC has made a safety assessment of the risk of operating closer to those objects and determined that it does not present an undue hazard. The PIC, VO, operator trainees or essential persons are not considered nonparticipating persons under this exemption.
27. **All operations shall be conducted over private or controlled-access property with permission from the property owner/controller or authorized representative.** Permission from property owner/controller or authorized representative will be obtained for each flight to be conducted.
28. **Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS-80) within 24 hours.** Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: [www.nts.gov](http://www.nts.gov).

### Certification of Waiver or Authorization (COA)

Whereas a Section 333 exemption is similar to obtaining pilot certificate, a COA is akin to filing a flight plan. In other words, the Section 333 exemption is the authorization from FAA that an operator is safe to fly while a COA focuses specifically on where the flights will take place and how they impact the NAS.

As of March 23, 2015, the FAA will automatically grant a "blanket" COA for flights at or below 200 feet to any UAS operator with a Section 333 exemption, provided the aircraft weighs less than 55lbs, operations are conducted during daytime VFR conditions, within visual-line-of-sight of the pilot, and at least:

- 5 NM from an airport having an operational control tower;

- 3 NM from an airport with a published instrument flight procedure, but not an operational tower;
- 2 NM from an airport without a published instrument flight procedure or an operational tower; and
- 2 NM from a heliport with a published instrument flight procedure.

Essentially, if a civil UAS operator’s activities comply with these restrictions, the Section 333 exemption process is all that needs to be completed. However, any Section 333 exemption holder who wants to fly outside the blanket parameters, must obtain a separate COA specific to the airspace required for that operation.

If a separate COA is needed, FAA recommends submitting the COA application at least 60 business days in advance of the intended operation. To file a COA application, the applicant must provide his or her Section 333 exemption number in addition to the aircraft registration number.

### Airport Coordination Requirements

There are several scenarios in which a civil UAS operator is required to coordinate flights with the airport. Basically, any flight within 5 NM of any airport should be coordinated on some level. The following table lists the required coordination method based on the type of airport and distance from it.

<i>Airport Type</i>	<i>Notification</i>	<i>Letter of Agreement</i>
<i>Operational Control Tower</i>		Within 5 NM*
<i>Uncontrolled with published instrument flight procedure</i>	Within 5 NM	Within 3 NM
<i>Uncontrolled airport without a published instrument flight procedure</i>	Within 5 NM	Within 2 NM
<i>Heliport with a published instrument flight procedure</i>	Within 5 NM	Within 2 NM

\* Letter of agreement with the air traffic control facility in addition to airport management.

Airport notification constitutes the UAS operator calling or emailing airport management and receiving acknowledgement that the notification was received. An example letter of agreement is provided on the following page for those instances where a letter of agreement is required.

While many airports may have contact information listed on their websites, the most comprehensive database of airport contact information can be found at <http://www.gcr1.com/5010web/>. This website stores FAA’s airport master record data, which includes contact information.

For determining the proximity of a flying site’s location to an airport or heliport, several online tools are currently in development. However beware, many of these maps leave off critical no fly zones such as private landing facilities and Temporary Flight Restrictions (TFRs). One example of a map that seems to show all the necessary information is <http://www.airmap.io/>. This map also provides contact information.

### Aircraft Registration

All civil UAS aircraft are required to be registered with FAA. Registration requires the completion of FAA Form 8050-1 Aircraft Registration Application, a description of the aircraft, evidence of ownership, confirmation the aircraft was not registered in a different country, and a \$5.00 registration fee.

Additional information regarding registering civil UAS aircraft can be found here:

[http://www.faa.gov/licenses\\_certificates/aircraft\\_certification/aircraft\\_registry/UA/](http://www.faa.gov/licenses_certificates/aircraft_certification/aircraft_registry/UA/).

# Example Letter of Agreement

For Unmanned Aircraft Operations near \_\_\_\_\_ [Airport/Heliport] \_\_\_\_\_

Effective: \_\_\_\_\_ [Date] \_\_\_\_\_

1. Purpose: This agreement establishes the responsibilities and flight procedures to be used between the \_\_\_\_\_ [Airport/Heliport] \_\_\_\_\_ and \_\_\_\_\_ [Operator] \_\_\_\_\_ for the control and operation of unmanned aircraft within (5 miles, 3 miles, 2 miles [Select Appropriate Response]) of the \_\_\_\_\_ [Airport/Heliport] \_\_\_\_\_.
2. Responsibilities: \_\_\_\_\_ [Operator] \_\_\_\_\_ shall:

<b>Company/Organization</b>	<b>Chief Pilot</b>
Name: _____	Name: _____
Address: _____	Address: _____
Phone Number: _____	Phone Number: _____
Section 333 Exemption #: _____	Email: _____
<b>Operational Information</b>	
Make and Model of Aircraft: _____	
Serial Number(s): _____	N-Number(s): _____
Mission: _____	

- a. Furnish and provide subsequent update to the following information:
  - b. Furnish \_\_\_\_\_ [Airport/Heliport] \_\_\_\_\_ a current copy of the operator’s Section 333 exemption to keep on file.
  - c. Operate in accordance with all conditions and limitations specified in the operator’s Section 333 exemption.
3. Flight Procedures: At least 24 hours prior to any flight, \_\_\_\_\_ [Operator] \_\_\_\_\_ shall:
  - a. Notify the [Airport/Heliport] Manager at ###-###-#### (and the Air Traffic Control Tower at ###-###-#### [As Appropriate]) and provide the following information:
    - i. Pilot Name
    - ii. Phone Number to Reach Pilot During Flight
    - iii. Time & Duration of Flight Activity
    - iv. Location & Altitude
    - v. Nature of the Activity
  - b. File a flight plan with Lockheed-Martin Flight Service at 1-800-WXBRIEF.
4. Signatures

_____ [Airport/Heliport] Manager	_____ Date
_____ (Air Traffic Control Manager [As Appropriate])	_____ Date
_____	_____

## Proposed Small UAS Rulemaking

In February 2015, FAA published a notice of proposed rulemaking for small UAS. The proposal offers safety rules for civil UAS aircraft under 55 pounds. Model aircraft, or those aircraft flown exclusively for recreational purposes, will continue to operate under existing model aircraft rules (see next section).

The following rules were proposed (**these rules are not final**):

### Operational Limitations

- 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 operator or visual observer.
- At all times the small unmanned aircraft must remain close enough to the operator for the operator 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 involved in the operation.
- Daylight-only operations (official sunrise to official sunset, local time).
- Must yield right-of-way to other aircraft, manned or unmanned.
- 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 airspeed of 100 mph (87 knots).
- Maximum altitude of 500 feet above ground level.
- Minimum weather visibility of 3 miles from control station.
- No operations are allowed in Class A (18,000 feet & above) airspace.
- 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 an operator or VO for more than one unmanned aircraft operation at one time.
- No careless or reckless operations.
- Requires preflight inspection by the operator.
- 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.
- Proposes a microUAS option that would allow operations in Class G airspace, over people not involved in the operation, provided the operator certifies he or she has the requisite aeronautical knowledge to perform the operation.

### Operator Certification and Responsibilities

- Pilots of a small UAS would be considered "operators".
- Operators would be required to:
  - o Pass an initial aeronautical knowledge test at an FAA-approved knowledge testing center.
  - o Be vetted by the Transportation Security Administration.
  - o Obtain an unmanned aircraft operator certificate with a small UAS rating (like existing pilot airman certificates, never expires).
  - o Pass a recurrent aeronautical knowledge test every 24 months.
  - o Be at least 17 years old.
  - o 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 proposed rule.

- Report an accident to the FAA within 10 days of any operation that results in injury or property damage.
- Conduct a preflight inspection, to include specific aircraft and control station systems checks, to ensure the small UAS is safe for operation.

### Aircraft Requirements

- FAA airworthiness certification not required. However, operator must maintain a small UAS in condition for safe operation and prior to flight must inspect the UAS to ensure that it is in a condition for safe operation. Aircraft Registration required (same requirements that apply to all other aircraft).
- Aircraft markings required (same requirements that apply to all other aircraft). If aircraft is too small to display markings in standard size, then the aircraft simply needs to display markings in the largest practicable manner.

The comment period for the proposed small UAS rulemaking ended April 24, 2015. No further updates have been provided by FAA.

### Model Aircraft (Recreational/Hobby)

First and foremost, model aircraft are for hobby or recreational purposes only. Any compensation gained as a result of using an unmanned aircraft exempts the operator from operating under model aircraft status.

In order to be considered a model aircraft, the following conditions must be met:

- 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



Currently, FAA recognizes the [Academy of Model Aeronautics](#) (AMA) as the primary community-based organization representing model aircraft. Among its many publications, AMA has a series of documents related to safety. Examples include *See and Avoid Guidance* as well as *Flying Site Safety and Operational Rules*. Most importantly, the AMA National Model Aircraft Safety Code establishes many basic rules relating to how model aircraft should be operated. Per Public Law 112-95 model aircraft operators are required to operate in accordance with this standard. The current National Model Aircraft Safety Code can be found on the following page.

Last Revised: 12/15/2015

# Academy of Model Aeronautics National Model Aircraft Safety Code

Effective January 1, 2014

- A. **GENERAL:** A model aircraft is a non-human-carrying aircraft capable of sustained flight in the atmosphere. It may not exceed limitations of this code and is intended exclusively for sport, recreation, education and/or competition. All model flights must be conducted in accordance with this safety code and any additional rules specific to the flying site.
1. Model aircraft will not be flown:
    - (a) In a careless or reckless manner.
    - (b) At a location where model aircraft activities are prohibited.
  2. Model aircraft pilots will:
    - (a) Yield the right of way to all human-carrying aircraft.
    - (b) See and avoid all aircraft and a spotter must be used when appropriate. (AMA Document #540-D.)
    - (c) Not fly higher than approximately 400 feet above ground level within three (3) miles of an airport without notifying the airport operator.
    - (d) Not interfere with operations and traffic patterns at any airport, heliport or seaplane base except where there is a mixed use agreement.
    - (e) Not exceed a takeoff weight, including fuel, of 55 pounds unless in compliance with the AMA Large Model Airplane program. (AMA Document 520-A.)
    - (f) Ensure the aircraft is identified with the name and address or AMA number of the owner on the inside or affixed to the outside of the model aircraft. (This does not apply to model aircraft flown indoors.)
    - (g) Not operate aircraft with metal-blade propellers or with gaseous boosts except for helicopters operated under the provisions of AMA Document #555.
    - (h) Not operate model aircraft while under the influence of alcohol or while using any drug that could adversely affect the pilot's ability to safely control the model.
    - (i) Not operate model aircraft carrying pyrotechnic devices that explode or burn, or any device which propels a projectile or drops any object that creates a hazard to persons or property.

Exceptions:

      - Free Flight fuses or devices that burn producing smoke and are securely attached to the model aircraft during flight.
      - Rocket motors (using solid propellant) up to a G-series size may be used provided they remain attached to the model during flight. Model rockets may be flown in accordance with the National Model Rocketry Safety Code but may not be launched from model aircraft.
      - Officially designated AMA Air Show Teams (AST) are authorized to use devices and practices as defined within the Team AMA Program Document. (AMA Document #718.)
    - (j) Not operate a turbine-powered aircraft, unless in compliance with the AMA turbine regulations. (AMA Document #510-A.)
  3. Model aircraft will not be flown in AMA sanctioned events, air shows or model demonstrations unless:
    - (a) The aircraft, control system and pilot skills have successfully demonstrated all maneuvers intended or anticipated prior to the specific event.
    - (b) An inexperienced pilot is assisted by an experienced pilot.
  4. When and where required by rule, helmets must be properly worn and fastened. They must be OSHA, DOT, ANSI, SNELL or NOCSAE approved or comply with comparable standards.
- B. **RADIO CONTROL (RC)**
1. All pilots shall avoid flying directly over unprotected people, vessels, vehicles or structures and shall avoid endangerment of life and property of others.
  2. A successful radio equipment ground-range check in accordance with manufacturer's recommendations will be completed before the first flight of a new or repaired model aircraft.
  3. At all flying sites a safety line(s) must be established in front of which all flying takes place. (AMA Document #706.)
    - (a) Only personnel associated with flying the model aircraft are allowed at or in front of the safety line.
    - (b) At air shows or demonstrations, a straight safety line must be established.
    - (c) An area away from the safety line must be maintained for spectators.
    - (d) Intentional flying behind the safety line is prohibited.
  4. RC model aircraft must use the radio-control frequencies currently allowed by the Federal Communications Commission (FCC). Only individuals properly licensed by the FCC are authorized to operate equipment on Amateur Band frequencies.
  5. RC model aircraft will not knowingly operate within three (3) miles of any pre-existing flying site without a frequency-management agreement. (AMA Documents #922 and #923.)
  6. With the exception of events flown under official AMA Competition Regulations, excluding takeoff and landing, no powered model may be flown outdoors closer than 25 feet to any individual, except for the pilot and the pilot's helper(s) located at the flightline.
  7. Under no circumstances may a pilot or other person touch an outdoor model aircraft in flight while it is still under power, except to divert it from striking an individual.
  8. RC night flying requires a lighting system providing the pilot with a clear view of the model's attitude and orientation at all times. Hand-held illumination systems are inadequate for night flying operations.
  9. The pilot of an RC model aircraft shall:
    - (a) Maintain control during the entire flight, maintaining visual contact without enhancement other than by corrective lenses prescribed for the pilot.
    - (b) Fly using the assistance of a camera or First-Person View (FPV) only in accordance with the procedures outlined in AMA Document #550.
    - (c) Fly using the assistance of autopilot or stabilization system only in accordance with the procedures outlined in AMA Document #560.
- C. **FREE FLIGHT**
1. Must be at least 100 feet downwind of spectators and automobile parking when the model aircraft is launched.
  2. Launch area must be clear of all individuals except mechanics, officials, and other fliers.
  3. An effective device will be used to extinguish any fuse on the model aircraft after the fuse has completed its function.
- D. **CONTROL LINE**
1. The complete control system (including the safety thong where applicable) must have an inspection and pull test prior to flying.
  2. The pull test will be in accordance with the current Competition Regulations for the applicable model aircraft category.
  3. Model aircraft not fitting a specific category shall use those pull-test requirements as indicated for Control Line Precision Aerobatics.
  4. The flying area must be clear of all utility wires or poles and a model aircraft will not be flown closer than 50 feet to any above-ground electric utility lines.
  5. The flying area must be clear of all nonessential participants and spectators before the engine is started.

## Airport Notification Requirements

All model aircraft flights within 5 miles of an airport require the operator to notify the airport prior to the flight. Adequate notification requires the airport to acknowledge the receipt of the notification. Therefore, it is inadequate for a model aircraft operator to leave a voicemail or send an email without receiving a response back prior to flight.

As discussed for civil UAS operators, there are many databases online which provide airport contact information. The most comprehensive database can be found at: <http://www.gcr1.com/5010web/>.

In order to determine if a flying location is within 5 miles of the nearest airport, there are several tools online under development. One such tool is <http://www.airmap.io/>.

## Model/Recreational UAS Registration

On December 14, 2015 the FAA announced a web-based aircraft registration process for owners of model/recreational UAS weighing more than 0.55 pounds and less than 55 including payloads such as on-board cameras.

After December 21, 2015, model/recreational UAS owners must register through a web-based system at: [www.faa.gov/uas/registration](http://www.faa.gov/uas/registration). Commercial UAS operators may not register via this system and should instead use FAA Form 8050-1 as described previously.

Registrants must be at least 13 years of age and US citizens.

Registrants will need to provide their name, home address and e-mail address. Upon completion of the registration process, the web application will generate a Certificate of Aircraft Registration/Proof of Ownership that will include a unique identification number for the UAS owner. This identification must be marked on the UAS by some means that is legible and allows the number to be readily seen.

Owners using the model aircraft for hobby or recreation will only have to register once and may use the same identification number for all of their model UAS. The registration is valid for three years.

The normal registration fee is \$5, but in an effort to encourage as many people as possible to register quickly, the FAA is waiving this fee for the first 30 days (from Dec. 21, 2015 to Jan 20, 2016).

## Penalties

UAS operators who fail to comply with FAA rules and regulations may face fines. FAA has previously indicated that typically fines range from \$1,100 to \$5,000. However, some recent fines have far exceeded this average. In October 2015, FAA proposed a \$1.9 million civil penalty against SkyPan International, Inc. of Chicago. Between March 21, 2012, and Dec. 15, 2014, FAA alleges SkyPan conducted 65 unauthorized operations in some of our most congested airspace and heavily populated cities, violating airspace regulations and various operating rules. FAA found these operations to be illegal and not without risk. Prior to this announcement, the highest fine assessed against Xizmo Media for \$18,700.

For those UAS operators that are also certificated pilots, FAA has the authority to also suspend or revoke a pilot certificate for violating UAS rules and regulations.

## Example Airport Notification Form

<b>Pilot Information</b>	
Name:	_____
Address:	_____
Phone Number:	_____ Email: _____
<b>Aircraft Information</b>	
Make and Model:	_____
Serial Number:	_____
<b>Location</b>	
Description of Location:	_____ _____
Distance From Airport:	_____ Altitude: _____
<b>Operational Information</b>	
Date of Flight:	_____ Start Time: _____ End Time: _____
Mission:	_____
Recreational Flight <input type="checkbox"/>	Commercial Flight <input type="checkbox"/>
<b>If Commercial</b>	
Section 333 Exemption #:	_____ Aircraft N-Number: _____
<b>Requires a Letter of Agreement within 5 miles of a controlled airport, 3 miles of an airport with an instrument approach, and 2 miles for an uncontrolled airport/heliport without an instrument approach.</b>	

## Helpful Links

Federal Aviation Administration: Unmanned Aircraft Homepage

<http://www.faa.gov/uas/>

How to Register a Civil UAS

[http://www.faa.gov/licenses\\_certificates/aircraft\\_certification/aircraft\\_registry/UA/](http://www.faa.gov/licenses_certificates/aircraft_certification/aircraft_registry/UA/)

How to Register a Model/Recreational UAS

<http://www.faa.gov/uas/registration/>

Small UAS Proposed Rulemaking:

<https://www.faa.gov/uas/nprm/>

Academy of Model Aeronautics:

<http://www.modelaircraft.org/>