



UAS 1011-D01

FAA Regulations: Part 107

Lesson 1b: Operating Rules

# FAA Regulations: Objectives

- To determine that the applicant is knowledgeable in the general regulatory requirements of 14 CFR part 107.
- To determine that the applicant is knowledgeable of the operating rules of 14 CFR part 107, the registration rules of 14 CFR parts 47 and 48, and other associated operating requirements.
- To determine that the applicant is knowledgeable in the requirements associated with remote pilot certification with an sUAS rating.
- To determine that the applicant is knowledgeable of the FAA waiver policy and requirements.

# FAA Regulations: Part 107 – Operating Rules- overview

1. Registration requirements for sUAS.
2. The requirement for the sUAS to be in a condition for safe operation.
3. Medical condition(s) that would interfere with safe operation of an sUAS.
4. The responsibility and authority of the remote PIC.
  - a. Allowing a person other than the remote PIC to manipulate the flight controls.
5. Regulatory deviation and reporting requirements for in-flight emergencies.
6. Hazardous operations.
  - a. Careless or reckless
  - b. Dropping an object
7. Operating from a moving aircraft or moving land- or water-borne vehicle.
8. Alcohol or drugs and the provisions on prohibition of use.
9. Daylight operation.
10. Visual line of sight (VLOS) aircraft operations.
11. The requirements when a visual observer is used.
12. The prohibition of operating multiple sUAS.

# FAA Regulations: Part 107 – Operating Rules- overview

13. The prohibition of carrying hazardous material.
14. Staying safely away from other aircraft and right-of-way rules.
  - a. See and avoid other aircraft and other potential hazard considerations of the remote PIC
15. Operations over human beings.
16. Prior authorization required for operation in certain airspace.
17. Operating in the vicinity of airports
18. Operating in prohibited or restricted areas.
19. Flight restrictions in the proximity of certain areas designated by notice to airmen (NOTAM).
20. Preflight familiarization, inspection, and actions for aircraft operations.
21. Operating limitations for sUAS.
  - a. Maximum groundspeed
  - b. Altitude limitations
  - c. Minimum visibility
  - d. Cloud clearance requirements
22. The requirements for a Remote Pilot Certificate with an sUAS rating.

# Registration requirements for sUS.

- a. All sUAS greater than 0.55 lbs. must be registered with the FAA prior to flight.
- b. Aircraft markings are required on the outside of the aircraft.

# Recreational Drones

- Section 336 was repealed.
- Flown strictly for recreational purposes.
- The recreational flyer must pass a test and keep proof of passing the test to show to FAA or law enforcement. The test will cover the recreational drone laws.
- Must obtain authorization prior to flying in B, C, D, or E at the surface associated with an airport airspace and complies with all airspace restrictions and prohibitions.
- Recreational aircraft have to be registered and marked. Must show registration to FAA or their designee if asked.
- The aircraft is operated in accordance with, or within the programming, of a community-based organization's set of safety guidelines that are developed in coordination with the Federal Aviation Administration. (In progress)

# Recreational Drones

- Flown within the visual line of sight of the person operating the aircraft, or a visual observer co-located **and who maintains** direct communication with the operator.
- Does not interfere with and gives way to any manned aircraft.
- Operations in Class G airspace
  - The aircraft is flown not more than 400 feet above ground level  
AND
  - Complies with all airspace restrictions and prohibitions. Including all security flight restrictions. Violation of Security flight restrictions can be punished with prison time.

For more information, read [Advisory Circular 91-57B](#).

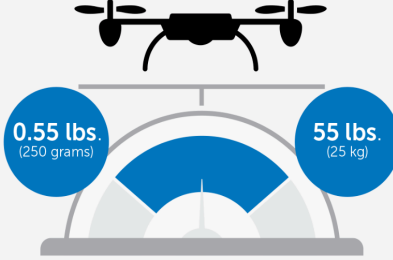
# Recreational Drones

- Unmanned aircraft, including model aircraft, cannot interfere with wildfire suppression efforts, law enforcement, or emergency response efforts.  
(49 U.S.C. Section 46320 and 18 U.S.C. 40A).
- Cannot fly in runway exclusion zones without authorization.  
(49 U.S.C 39B).
- It's also a crime to fly knowingly or recklessly interfering with, or disrupt the operations of, a manned aircraft in a manner that poses a imminent safety hazard to the occupant(s).  
(49 U.S.C 39B).
- Recreational flyers need to know airspace and how to identify where and where not to fly.



# Do I need to register my sUAS?

You need to register your aircraft if it weighs between **0.55 lbs.** (250 grams) and up to **55 lbs.** (25 kg)



You will be subject to civil and criminal penalties if you meet the criteria to register an unmanned aircraft and do not register.

Effective December 12, 2017: All Drone Owners are required to register their drones.

Registration requirements apply to all Model and Commercial sUAS!

Reference: [Federal Drone Registration](#)

# sUAS Registration

Federal Aviation Administration

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FAADroneZone

Welcome to the FAADroneZone

Fly sUAS under Part 107

I need to register my small unmanned aircraft for recreational, commercial, governmental, or other purposes under **Part 107**. Each drone must be registered at a cost of \$5.00 and registration is valid for a period of 3 years. Also use this option to apply for a waiver/authorization, or reporting an accident under Part 107.

Register ?

Fly Model Aircraft under Section 336

I need to register my small unmanned aircraft to fly with an aero-modeling club and following all requirements of the **Special Rule for Model Aircraft**.

Register ?

Already registered? [Log In](#) to your existing account.

For general information about drones, [rules for flying](#), and how to [become a drone pilot](#), visit the [FAA website](#).

[Register a drone that weighs 55 lbs. or more.](#)

<https://registermyuas.faa.gov>

UAS operations require a Foreign Aircraft Permit if it involves a civil aircraft that is:

- Registered in a foreign country, or <sup>[SEP]</sup>
- Owned, controlled, or operated by someone who is not a U.S. citizen or <sup>[SEP]</sup> permanent resident. <sup>[SEP]</sup>

# Who Can Register a sUAS?

- The UAS must be registered by a person who is at least 13 years of age.
- If the owner of the UAS is less than 13 years of age, then it must be registered by another person who is at least 13 years of age.

# sUAS Markings

- Before operation, the sUAS must be marked with the registration number.
- The registration marking must be:
  - **A unique identifier number.** This is typically the FAA-issued registration number or the serial number.
  - **Legible and durable.** Markings may be applied by the use of engraving, permanent marker, or self-adhesive label.
  - **Visible or accessible without tools.** The number may be enclosed in a compartment only if you can access the compartment without tools.

# Medical condition(s) that would interfere with safe operation of an sUAS

- a. The safe operation of a sUAS relies on many factors including: the physical and mental capabilities of the remote PIC and anyone else involved in the operation.
- b. No person can be involved in the operation of an sUAS if they know, or have reason to know, that they have a physical or mental condition that could interfere with the safe operation of the sUAS. This applies to everyone participating in the operation and is NOT Limited to the RPIC.

# The Remote Pilot In Command (RPIC)

The Remote Pilot in Command (Remote PIC) is directly responsible for and is the final authority on the operation of the sUAS under Part 107. The RPIC must be designated prior to each flight but can change during flight so long as both RPICs maintain Visual Line-of-sight and control of the UAV.

The RPIC must:

1. Ensure that the sUAS is maintained in a condition for safe operation.
2. Must inspect the sUAS prior to flight to ensure that it is in a condition for safe operation.

# The responsibility and authority of the remote PIC

- Assessing the operating environment
- Briefing crew members
- Ensuring all control links are working
- Monitoring battery power
- Monitoring payloads
- Ensuring all documents are easily accessible
- Everything else that affects the safe operation of the sUAS

# Checklists – Use them they make you a better and safer pilot!

Examples of Checklists you should use:

- a. Prefield Checklist
- b. Preflight Checklist
- c. Post Flight Checklist



# The responsibility and authority of the remote PIC.

The Remote Pilot in Command (Remote PIC) may:

1. Allow a person other than the remote PIC to manipulate the flight controls.

## When

1. The person manipulating the controls is directly supervised by a remote PIC who has met the recurrent testing/training requirement.
2. The remote PIC has the ability to immediately take direct control of the sUAS.

# When someone other than the RPIC is manipulating the controls

The RPIC must be:

- Standing close enough to physically take over the control station.

OR

- Using a "buddy box" system with two control stations.

OR

- Using a pre-programmed safe-mode system with "home" or "hover" functions.

# Visual Observer (VO)

- The VO(s) assist the RPIC by:
  - Identifying potential hazards to safe operations
  - Alerting the RPIC and rest of the crew of hazards
- Not Required by FAA
  
- BUT the use of VOs can:
  - Improve situational awareness
  - Maintain Visual Line-of-Sight

# Regulatory deviation and reporting requirements for in-flight emergencies.

- a. The RPIC is permitted to deviate from any rule of Part 107 to the extent necessary to respond to an emergency.
- b. Upon FAA request, a RPIC who exercises this emergency power is required to send a written report to the FAA explaining the deviation.
- c. Emergency actions should be taken in such a way as to minimize injury or damage to property.

# Hazardous operations.

Prohibited Operations include:

- a. Careless or reckless flight
- b. Dropping an object from a sUAS
- c. Operations that interfere with manned aircraft operations
- d. Operating an sUAS over persons not directly participating in the operation
- e. Loading the sUAS beyond its capabilities to the point of losing control
- f. Failure to consider weather conditions near structures, trees, or rolling terrain when operating in a densely populated area
- g. Flying near emergency responders, firefighters or police during a crisis

# Operating from a moving aircraft or moving land- or water-borne vehicle.

- a. Operations from a moving vehicle on land or water are permitted in sparsely populated areas ONLY.
- b. Operation of a sUAS is NEVER permitted from a moving aircraft.

# Alcohol or drugs and the provisions on prohibition of use.

No crewmember may participate in any sUAS operation if:

- They have consumed alcohol within the preceding 8-hours.
- They have a blood alcohol level of 0.04 percent or greater.
- They are using any drug that affects the person's mental or physical capabilities.

# Daylight operation.

- a. For the Continental US that is, the period from 30 minutes before sunrise to 30 minutes after sunset, local time.
- b. The periods 30 minutes before sunrise and 30 minutes after sunset are referred to as "Civil Twilight."
- c. Flights during Civil Twilight require that the sUAS have anti-collision lights visible for 3 miles in all directions.



# Night Operations-

This rule allows routine operations of small UAS at night under two conditions: (effective 3/21)

- The remote pilot in command must complete an updated initial knowledge test or online recurrent training, and
- The small unmanned aircraft must have lighted anti-collision lighting visible for at least three (3) statute miles that has a flash rate sufficient to avoid a collision.

# Visual line of sight (VLOS) aircraft operations.

The RPIC and the person manipulating the controls maintain a visual line-of-sight at all times during flight.

- a. VLOS must be maintained without the use of any equipment beyond normal eyeglasses or contact lenses.
- b. Brief periods of loss of VLOS are allowed when required for:
  - The safety of the operation
  - Operational necessity
- c. Visual Observers should scanning for air traffic by systematically focusing on different segments of the sky for short intervals.

# Miscellaneous Operating Rules

Part 107 Prohibitions against:

- a. Simultaneous Operation of Multiple Small UAVs
- b. Carrying of Hazardous Material

Part 107 Requirement to “See and Avoid”

- a. All sUAS operations must be conducted in a fashion that avoids interference with operations and traffic patterns at any airport, heliport, or seaplane base.
- b. The RPIC is responsible to stay clear of and yield the right-of-way to ALL other aircraft, including other sUAS, and to avoid other potential hazards that may affect their operation of the aircraft.

# Operations over people-

## Prior to new rule

Part 107 prohibits flying a small UA directly over a person who:

- a. Is not directly participating in the operation of the sUAS.
- b. Is not under a safe cover, such as a protective structure or a stationary vehicle.

Individuals directly participating in the operation of the sUAS include:

- a. RPIC
- b. Person manipulating the controls
- c. VO(s)
- d. and crewmembers who are necessary for the safety of the sUAS operation

All members of the crew must be briefed by the RPIC prior to the commencement of the flight.

# Operations over people

The Operation of Unmanned Aircraft Systems Over People Final Rule is the next incremental step towards further integration of unmanned aircraft (UA) in the National Airspace System. The final rule allows routine operations over people and routine operations at night under certain circumstances. The rule will eliminate the need for typical operations to receive individual part 107 certificate of waivers from the FAA.

The rule will become effective 60 days after publication in the Federal Register, which is expected in January 2021.

# Operations over people

The ability to fly over people varies depending on the level of risk that a small UAS operation presents to people on the ground. Operations over people are permitted subject to the following requirements:

- Category 1 small unmanned aircraft are permitted to operate over people, provided the small unmanned aircraft:
  - Weigh 0.55 pounds or less, including everything that is on board or otherwise attached to the aircraft at the time of takeoff and throughout the duration of each operation.
  - Contain no exposed rotating parts that would cause lacerations.
- In addition, for Category 1 operations, no remote pilot in command may operate a small unmanned aircraft in sustained flight over open-air assemblies unless the operation is compliant with [Remote ID](#).

# Operations over people

- Category 2 and Category 3 provide performance-based eligibility and operating requirements when conducting operations over people using unmanned aircraft that weigh more than .55 pounds but do not have an airworthiness certificate under part 21.
- In addition, for Category 2 operations, no remote pilot in command may operate a small unmanned aircraft in sustained flight over open-air assemblies unless the operation is compliant with [Remote ID](#).

# Operations over people

- Category 3 small UAS have further operating restrictions. A remote pilot in command may not operate a small unmanned aircraft over open-air assemblies of human beings. Additionally, a remote pilot in command may only operate a small unmanned aircraft over people if:
  - The operation is within or over a closed- or restricted-access site and all people on site are on notice that a small UAS may fly over them; or
  - The small unmanned aircraft does not maintain sustained flight over any person unless that person is participating directly in the operation or located under a covered structure or inside a stationary vehicle that can provide reasonable protection from a falling small unmanned aircraft.



# Operations over people

- Category 4 operations is an addition from the NPRM. This category allows small unmanned aircraft issued an airworthiness certificate under part 21 to operate over people, so long as the operating limitations specified in the approved Flight Manual or as otherwise specified by the Administrator, do not prohibit operations over people. Additionally, no remote pilot in command may operate a small unmanned aircraft in sustained flight over open-air assemblies unless the operation is compliant with Remote ID. To preserve the continued airworthiness of the small unmanned aircraft and continue to meet a level of reliability that the FAA finds acceptable for operating over people in accordance with Category 4, additional requirements apply.

# Operations over people

- Note: Sustained flight over an open-air assembly includes hovering above the heads of persons gathered in an open-air assembly, flying back and forth over an open-air assembly, or circling above the assembly in such a way that the small unmanned aircraft remains above some part the assembly. 'Sustained flight' over an open-air assembly of people in a Category 1, 2, or 4 operation does not include a brief, one-time transiting over a portion of the assembled gathering, where the transit is merely incidental to a point-to-point operation unrelated to the assembly.

# Operation over Moving Vehicles

- In a change from the NPRM, the final rule permits operations over moving vehicles, provided the small unmanned aircraft operation meets the requirements of Category 1, 2 or 3 **and** either:
  - The small unmanned aircraft must remain within or over a closed- or restricted-access site, and all people inside a moving vehicle within the closed- or restricted-access site must be on notice that a small unmanned aircraft may fly over them; or
  - The small unmanned aircraft does not maintain sustained flight over moving vehicles.
- A remote pilot may also conduct operations over moving vehicles with a small unmanned aircraft eligible for Category 4 operations as long as the applicable operating limitations in the approved Flight Manual or as otherwise specified by the Administrator do not prohibit such operation.

# Prior authorization required for operation in certain airspace.

Prior authorization by air traffic control (ATC) is required for sUAS flights in:

- a. Class B, Class C, and Class D airspace, and within the lateral boundaries of the surface area of Class E airspace designated for an airport.
- b. ATC authorization is NOT required to operate at or near an airport so long as the flight remains entirely outside controlled airspace.

# Operating in prohibited or restricted areas

sUAS flights are prohibited in areas designated as “Prohibited” or “Restricted” unless prior permission is obtained from the using or controlling agency.

This will be covered in more detail in later lectures.

# Temporary Flight Restrictions (TFR) & Notice to Airmen (NOTAM)

- a. Temporary Flight Restrictions are issued by way of a Notice to Airmen
- b. Temporary so can, and do, change
- c. The RPIC is responsible to check for any TFRs that may impact the area in which they are flying.
- d. TFRs apply to all aircraft, not just sUAS operators, or manned aircraft pilots.
- e. TFRs are issued for a variety of reasons including:
  - Presidential TFRs and NOTAMs
  - Emergency response TFRs and NOTAMs
  - Standing TFRs that go into and out of effect (e.g., stadiums for sporting events)

Additional information on TFRs is discussed in the Air Space lecture.

# Operating limitations for sUAS

- a. Maximum groundspeed (100 mph)
- b. Altitude limitations (400' AGL\*)
- c. Minimum visibility (3 statute miles)
- d. Cloud clearance requirements (at least 500' below and at least 2000' horizontally from clouds)

\* If flying above a structure (e.g. a building or tower) causes the sUAS to enter controlled airspace the RPIC must follow the appropriate air traffic control (ATC) procedures.

# Preflight familiarization, inspection, and actions for aircraft operations

Prior to each flight the RPIC is responsible for

- a. Inspection of all components of the UAS
  - UAV
  - Station
  - Battery Control Status
  - Control & Telemetry links between UAV & Control Station
- b. Airspace
- c. Weather Conditions
- d. Site Inspection
  - Potential Hazards
  - Emergency Landing Sites
  - Potential Privacy Concerns
- e. Required Waivers
- f. Preflight Documentation

These will be covered in more detail in later lectures.