

UAS Standards, Reg, Law & Exam

FAA Regulations: Part 107

Lesson 1a – General Regulations



Objectives of FAA Regulations

- To determine the applicant is knowledgeable in the general regulatory requirements of the Title 14 of the Code of Federal Regulations (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 Part 47 and Part 48, and other associated operating requirements
- To determine that the applicant is knowledgeable in the requirements associated with remote pilot certification with an small UAS (sUAS) rating
- To determine that the applicant is knowledgeable of the FAA waiver policy and requirements



FAA Regulations: Part 107 – General

- The applicability of 14 CFR Part 107 to small unmanned aircraft (sUA) operations
- Definitions as outlined and used in 14 CFR Part 107
- The ramification of falsification, reproduction, or alteration of a certificate, rating, authorization, record, or report
- Accident reporting
- Inspection, testing, and demonstration of compliance



The Applicability of 14 CFR Part 107 to sUAS Operations

- Exclusions from 14 CFR Part 107 – or what does 14 CFR Part 107 Not Apply?
 - ❑ Model aircraft flown strictly for hobby or recreational use¹
 - ❑ Limited recreational operations of UAS that occur in accordance with Title 49 of United States Code (U.S.C.) 44809²
 - ❑ Operations conducted outside the United States
 - ❑ Amateur rockets
 - ❑ Moored balloons or unmanned free balloons
 - ❑ Kites
 - ❑ Public aircraft operations
 - ❑ Air carrier operations

1. Guidance on recreational flight: https://www.faa.gov/uas/recreational_flyers

2. Exception for limited recreational operations of unmanned aircraft: <https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title49-section44809&num=0&edition=prelim>



Definitions Outlined and Used in 14 CFR Part 107

- **Unmanned aircraft (UA)** – an aircraft operated without the possibility of direct human intervention from within or on the aircraft
- **Small unmanned aircraft (sUA)** – A UA weighing less than 55 pounds, including everything that is onboard or otherwise attached to the aircraft, and can be flown without the possibility of direct human intervention from within or on the aircraft
- **Small unmanned aircraft system (sUAS)** – an sUA and its associated elements (including communication links and the components that control the sUA) that are required for the safe and efficient operation of the sUA in the national airspace system (NAS)
- **Corrective lenses** – spectacles or contact lenses



Definitions Outlined and Used in 14 CFR Part 107

- **Remote pilot in command (Remote PIC or RPIC or Remote Pilot)** – a person who holds a remote pilot certificate with an sUAS rating and has the final authority and responsibility for the operation and safety of an sUAS operation conducted under Part 107
- **Person manipulating the controls** – a person other than the RPIC who is controlling the flight of an sUAS under the supervision of the RPIC
- **Visual observer (VO)** – a person who is designated by the RPIC to assist the RPIC and the person manipulating the flight controls to see and avoid other air traffic or objects aloft or on the ground
- **Visual line-of-sight (VLOS)** – RPIC, person manipulating the controls, or visual observer can see the sUAS without any obstruction



Definitions Outlined and Used in 14 CFR Part 107

- **Model aircraft** – a UA that is:
 - ❑ Capable of sustained flight in the atmosphere
 - ❑ Flown within visual line-of-sight (VLOS) of the person operating the aircraft
 - ❑ Flown for hobby or recreational purpose
- **Public aircraft** – means any of the following:
 - ❑ An aircraft used only for the U.S. government
 - ❑ An aircraft owned by the U.S. government and operated by any person for purposes related to crew training, equipment development, or demonstration
 - ❑ An aircraft owned and operated by the government of a state, the District of Columbia, or a territory or possession of the United States or a political subdivision of one of these governments
 - ❑ An aircraft exclusively leased for at least 90 continuous 90 days by the government of a state, the District of Columbia, or a territory or possession of the United States or a political subdivision of one of these governments
 - ❑ An aircraft owned or operated by the armed forces or chartered to provide transportation or other commercial air service to the armed forces



Definitions Outlined and Used in 14 CFR Part 107

- Beyond visual line of sight (BVLOS): – means flight crew members (i.e., RPIC, the person manipulating the controls, and VO, if used) are not capable of seeing the aircraft with vision unaided by any device other than corrective lenses (spectacles and contact lenses)
- Certificate of waiver (CoW) and certificate of authorization (CoA) – means an FAA approval grant for a specific flight operation
- Civil Twilight – the period of time that begins 30 minutes before official sunrise and ends at official sunrise, and the period of time that begins at official sunset and ends 30 minutes after official sunset. In Alaska, the period of civil twilight is defined in the Air Almanac (astronomical data for air celestial navigation)
- Crewmember – a person assigned to perform an operational duty during UAS operations. A UAS crewmember includes the RPIC, person manipulating the controls, and VOs, but may include other persons as appropriate or required to ensure safety operation of the UAS.



Definitions Outlined and Used in 14 CFR Part 107

- Data link – a wireless communication channel between one CS and one UA; its utility may include, but is not limited to, uplink command and control (C2) data, downlink telemetry, and payload data; a data link may consist of the following types:
 - Uplink – the transmittal of data from the CS to the UA
 - Downlink – the transmittal of data from the UA to the CS
- Direct control – the capability of a remote pilot to manipulate the flight control surfaces of the UA in a direct fashion using, for example, a radio control box with joystick or a ground control station using conventional type aircraft controls (such as yoke/stick, rudder pedals, power levers, and other ancillary controls); this infers a one-to-one correspondence between control input and flight control surface deflection
- Indirect control – the capability of a remote pilot to affect the trajectory of the UA through computer input to an onboard flight control system



Definitions Outlined and Used in 14 CFR Part 107

- 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 predicable or planned manner because lost link procedures are not established are not being executed by the UA
- Lost link – an interruption or loss of positive control between the CS and UA or when the pilot is unable to effectively control the aircraft; lost link is not considered as flyaway
- Lost link procedures – programmed or predetermined mitigations to ensure the continued safe operations of the UA in the event of lost link; in the event positive link cannot be achieved, flight termination must be implemented



Summary of Regulatory Requirements for RPIC

The RPIC:

- Is the final authority
- Is responsible to see and avoid
- Is responsible for the crew and their actions during the flight
- Is responsible for the operating conditions of the sUAS
- Must maintain visual line-of-sight with the sUAS
- Is responsible to yield right of way to other aircraft
- Is responsible to know the surroundings
- Is responsible to know airspace
- Is responsible to obtain any required certificates of waivers (CoW) and/or Authorization (CoA)



Summary of Major Provisions under 14 CFR Part 107

Aircraft Requirements:

- Any sUAS greater than 0.55 lbs. (does not include 0.55 lbs.) must be registered with the FAA prior to flight
- Aircraft markings are required
- FAA airworthiness certification is not required; however, the RPIC must maintain sUAS in a condition for safe operation and prior to flight must inspect the sUAS to ensure that it is in a condition for safe operation
- 14 CFR Part 107 does not apply to model aircraft that satisfy all of the criteria specified in Public Law 112-95 section 336*
- 14 CFR Part 107 codifies the FAA's enforcement authority in Part 101 by prohibiting model aircraft operators from endangering the safety of the NAS

*<https://www.congress.gov/112/plaws/publ95/PLAW-112publ95.pdf>



Summary of Major Provisions under 14 CFR Part 107

RPICs are required to:

- Be at least 16 years old
- Be able to read, speak, write, and understand the English language (FAA may make exceptions for medical reasons)
- Be in physical and mental condition that would not interfere with the safe operation of an sUAS
- Pass an initial aeronautical knowledge test at an FAA-approved knowledge testing center (or pass a FAA online course, for Part 61 certificate holders)
- Obtain an unmanned aircraft operator certificate with an sUAS rating (like existing pilot airman certificates, never expires)
- Pass a recurrent in-person aeronautical knowledge test every 24 months; but effective March 16, 2021, certified remote pilots are no longer required to take an in-person test every 24 months to keep their certificate current; all you need to do is take a free “refresher training” online with FAA

*<https://www.congress.gov/112/plaws/publ95/PLAW-112publ95.pdf>



Summary of Major Provisions under 14 CFR Part 107

Prior to flight, the RPIC must:

- Conduct a preflight inspection, to include specific aircraft and control station system checks, to ensure the sUAS is safe for operation
- Make available to the FAA, upon request, the sUAS for inspection or testing, and any associated documents/records

After flight, the RPIC must:

- Report any accidents to the FAA within 10 days if the sUAS operation results in serious injury or property damage over \$500

*<https://www.congress.gov/112/plaws/publ95/PLAW-112publ95.pdf>



Summary of Major Provisions under 14 CFR Part 107

Operational Requirements and Limitations

- Unmanned aircraft (UA) must weigh less than 55 lbs. (25kg)
- Visual line-of-sight (VLOS) only – the small unmanned aircraft must remain within VLOS of the RPIC and the person manipulating the flight controls of the small unmanned aircraft; alternatively, the small unmanned aircraft must remain within VLOS of the visual observer
- At all times the small unmanned aircraft must remain close enough to the RPIC, and the person manipulating the flight controls of the small unmanned aircraft for those people to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses
- The RPIC may use visual observers (VOs), but they are not required
- No person may act as a RPIC, a person manipulating the controls, or VO for more than one small unmanned aircraft operation at one time*

*Need to obtain permission from the FAA to operate multiple drones simultaneously.



Summary of Major Provisions under 14 CFR Part 107

Operational Requirements and Limitations

- Small unmanned aircraft operations are generally permitted during daylight hour; for operations conducted during civil twilight and night, the sUAS must be equipped with anti-collision lights that are capable of being visible for at least three (3) statute miles; however, the RPIC may reduce the intensity of the lighting if it would be in the interest of operational safety to do so
- Must yield right-of-way to other aircraft, manned or unmanned
- No person may operate an sUAS over a human being unless:
 - ❑ That human being is directly participating in the operation of the sUAS
 - ❑ That human being is located under a covered structure or inside a stationary vehicle that can provide reasonable protection from a falling sUAS
 - ❑ The operation meets the requirements of at least one of the operational categories specified in Sub-part D of Part 107



Summary of Major Provisions under 14 CFR Part 107

Operational Requirements and Limitations

- No person may operate a sUAS:
 - From a moving aircraft
 - From a moving land or water-borne vehicle unless the sUAS is flown over a sparsely populated area and is not transporting another person's property for compensation or hire
- Maximum groundspeed of 100 mph (87 knots)
- Maximum altitude of 400 feet above ground level unless flown with a 400-foot radius of a structure and does not fly higher than 400 feet above the structure's intermediate uppermost limit
- Minimum visibility, as observed from the location of the control station, must be no less than 3 statute miles
- Minimum distance from clouds must be no less than 500 feet below a cloud and 2,000 feet horizontally from the cloud



Summary of Major Provisions under 14 CFR Part 107

Operational Requirements and Limitations

- No operations are allowed in Class A (18,000 feet and above at mean sea level) airspace
- Operations in Class B, C, D, and E airspace are allowed within the required ATC permission
- Operations in Class G airspace are allowed without ATC permission
- No careless or reckless operations
- No carriage of hazardous materials
- Requires preflight inspection by the RPIC
- 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 sUAS
- All remote pilots who are required to register or have registered their drone must operate in accordance with the rule on Remote ID*

*https://www.faa.gov/uas/getting_started/remote_id



Inspection, Testing, and Demonstration of Compliance

Remote pilots must be available to the FAA, upon request, to provide the sUAS for inspection or testing. In addition, remote pilots must verify before flight that all required documentation is physically or electronically available in the event of an on-site FAA inspection. Such documentation may include:

- Remote pilot certificate
- Aircraft registration
- Aircraft maintenance and flight records
- Any waiver or exemption for flight operations
- Other documentation related to the operation

All aforementioned documents must be available for inspection by any authorized representative of the FAA and can be requested at any time.



Falsification, Reproduction, or Alteration

The falsification, reproduction, or alteration of records will not be tolerated.

The FAA relies on information provided by owners and remote pilots of sUAS when it authorizes operations or when it has to make a compliance determination. Accordingly, the FAA may take appropriate action against an sUAS owner, operator, RPIC, or anyone else who fraudulently or knowingly provides false records or reports, or otherwise reproduces or alters any records, reports, or other information for fraudulent purposes. Such action could include civil sanctions and the suspension or revocation of a certificate or waiver.



Accident Reporting

The RPIC must report any sUAS accident to the FAA, within 10 days of the operation, if any of the following thresholds are met:

- Serious injury to any person or any loss of consciousness
- Damage to any property, other than the small unmanned aircraft, if the cost is greater than \$500 to repair or replace the property (whichever is lower)

The report should include the following information:

- Name of RPIC, contact information, and airman certificate number
- sUAS registration number
- Location, date, time of accident
- Person(s) injured and extent of injury, if any or known
- Property damaged and extent of damage, if any or known
- Description of what happened



Advisory Circulars (ACs)

- Advisory Circulars (ACs) are FAA documents that provide guidance and information on various topics related to aviation regulations, procedures, and practices. They are not regulatory requirements but rather serve as recommendations, interpretations, and explanations of existing regulations and standards.
- While compliance with ACs is not mandatory, they are considered valuable resources for obtaining additional guidance and clarification on regulatory requirements and industry practices. ACs may also provide suggested methods, techniques, or procedures for achieving compliance with regulatory standards.
- AC subjects you may be required to recall on the Aeronautical Knowledge Test are:
 - ❑ 60 – Airman
 - ❑ 70 – Airspace
 - ❑ 90 – Air traffic and general operating rules
- ACs available for download on the FAA's website and are issued to inform the public of non-regulatory material, and they are non-binding
- An example AC discussing sUAS best practices is provided in the course reference documents folder (Week 1 Reference Documents)

