



The Drone Coach

Lesson 1: Applicable Regulations

To apply for apply for a part 107 remote pilot certificate with an sUAS rating, you must satisfy the following eligibility requirements:

- Pass the initial aeronautical knowledge test at an FAA-approved knowledge testing center.
- Be at least 16 years of age.
- Be in a physical and mental condition that would not interfere with the safe operation of sUAS (although the FAA does not require students to provide a medical certificate or pass a physical exam).
- Be able to read, write and understand the English language (although the FAA may make exceptions for medical reasons).
- Pass a background check by the Transportation Security Administration (TSA). The TSA background check is performed automatically with your application.

Small Unmanned Aircraft Systems

Includes unmanned aircraft, small unmanned aircraft, sUAS, UAS, UA

Applies to the operation of certain civil small unmanned aircraft within the National Aeronautical System (NAS), a civil small unmanned aircraft must meet the following criteria:

- Weigh less than 55 pounds including everything that is onboard or otherwise attached to the aircraft.
- Are operated without the possibility of direct human intervention from within or on the aircraft.
- Must register your sUAS with the FAA if sUAS weights between .55 lbs. and 55 lbs. (not 55 lbs. or less but less than 55 lbs.).
- Must be at least 13 years of age to register a sUAS. If the owner is less than 13, then the sUAS must be registered by a person who is at least 13 years of age.



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Part 107 does not apply to: amateur rockets, moored balloons or unmanned free balloons, kites, public aircraft operations, operations conducted outside the United States, or air carrier operations. In accordance with Part 101 Subpart E of Model Aircraft rules, part 107 also does not apply to model aircraft flown strictly for hobby or recreational use.

Additional FAA part 107 Requirements

Registration Markings

Before operation, you must mark your sUAS to identify that it is registered with the FAA, and this applies to both hobbyist and commercial sUAS operators. The number must be legible and durable, such as permanent marker or self-adhesive label, and the number must also be visible and accessible without the use of tools.

You can find a variety of companies online that can print registration number stickers which will help provide a more professional look.

sUAS aircraft maybe registered at <https://faadronezone.faa.gov>

Foreign Aircraft Registration

If your sUAS is registered in a foreign country or, if sUAS your is owned, controlled, or operated by someone who is not a U.S. citizen, the remote pilot must obtain a Foreign Aircraft Permit *before* conducting any operations.



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Recertification Requirements/Change of Address

- Remote pilots must renew their part 107 certification every 24 months by taking the recurrent exam online for free at <https://www.faasafety.gov/>.
- Remote pilots must also notify the FAA of address changes within 30 days. A remote pilot may not operate their sUAS commercially for hire until FAA receives the change of address notification.

Change of address may be filed online at:

<https://amsrvs.registry.faa.gov/amsrvs/Logon.asp>

Conditions for Safe Operation

An FAA airworthiness certification for your sUAS is not required before operation. However, the remote pilot must maintain and inspect the sUAS prior to each flight to ensure that it is in a condition for safe operation. FAA typically requires that owners follow their manufacture's guidelines as to what is safe and unsafe however, many sUAS manufacturers do not provide a maintenance procedure or checklist. When no guidelines for maintenance is provided, the FAA suggests you keep a journal of maintenance and repairs. A flight log is highly recommended.

Accident Reporting

The remote pilot is required to report accidents to the FAA *within 10 days* following serious accident to a person or damage to property in excess of \$500, *excluding your sUAS*. FAA defines serious injury to a person such as loss of consciousness, broken bone, or skin laceration that requires sutures. Physical damage must be reported if the cost to replace or repair is *more than \$500*, not including costs of repairs to sUAS. That is, if an \$800 awning is damaged from your crashing sUAS, but it will only cost \$400 to repair the awning, then the accident does not have to be reported to the FAA.



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Remote Pilot in Command Requirements

An sUAS operation may involve one individual or a team of crewmembers which can consist of the remote pilot in command, a different person who is manipulating the remote controls, and a visual observer (VO).

1. Remote Pilot in Command (Remote Pilot): A person who holds a current remote pilot certificate with an sUAS rating and has the final authority and responsibility for the operation and safety of the sUAS.
2. Person Manipulating the Controls: A person controlling the sUAS under direct supervision of the remote pilot in command.
3. Visual Observer (VO): A person acting as a flight crewmember to help see and avoid air traffic or other objects in the sky, overhead, or on the ground.

Remote Pilot in Command

The remote pilot in command must be designated before each flight, but that can change during the flight provided the remote pilot can ensure the operation poses no undue hazard to people, aircraft, or property. In the event of loss of control of the aircraft for any reason, the remote pilot must comply with all applicable regulations of Part 107.

Person Manipulating the Controls

A non-certificated person may operate the sUAS commercially only if he/she is directly under the supervision of the remote pilot in command and, the remote pilot has the ability to immediately take direct control of the sUAS. Use of another person manipulating the controls is optional.

Visual Observer

The role of visual observers (VO) is to alert the rest of the crew about potential hazards during sUAS operations. The use of a visual observer is optional, and the remote pilot may use one or more VO's to supplement situational awareness and visual-line-of-sight responsibilities while the remote pilot is conducting other mission-critical duties.



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The remote pilot in command must make certain that all visual observers are positioned in a location where they are able to see the sUAS continuously and sufficiently to maintain visual line of sight, while retaining a means to effectively communicate the sUAS position and the position of other aircraft to the remote pilot and person manipulating the controls.

Part 107 permits transfer of control of the sUAS between two or more certified remote pilot in command's however, transfer must be accomplished while maintaining visual line of sight of the sUAS and without loss of control of sUAS.

Operating Rules

Operating Times and Restrictions

- As of April 21, 2021, part 107 permits the operation of a small UAS at night commercially with the use of a waiver, providing the remote pilot adheres to the rules (the use of anti-collision lighting).
- When sUAS operations are conducted at night after civil twilight, the sUAS must be equipped with anti-collision lights that are capable of being visible for at least 3 statute miles. However, the remote pilot may reduce the intensity of the lighting if he or she has determined that it would be in the interest of operational safety to do so.
- The small unmanned aircraft must remain within visual line of sight for all flight crewmembers, unaided by any device other than corrective lenses. 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 2000 feet horizontally from the cloud. Crew members must be able to see the small unmanned aircraft at all times during flight, even at night.



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Restrictions on Visual Aids

Corrected lenses and contacts permitted

Visual line of sight must be accomplished and maintained by unaided vision, except vision that is corrected by the use of eyeglasses or contact lenses. However, vision aids such as binoculars may be used, but only to momentarily enhance situational awareness, such as to avoid flying over persons or to avoid conflicting with other aircraft. Remember, the key word regarding binocular use is momentarily.

Regaining Visual Line Of Sight

The remote pilot or person manipulating the controls may have brief moments when he/she is not looking directly at, or cannot see the small unmanned aircraft, but still retains the capability to see it quickly again or to be able to quickly maneuver it back to line of sight. These moments should be for:

- the safety of the operation, such as briefly looking down at the control station or scanning the airspace.
- to scan for traffic, the crew or remote pilot should systematically focus on different segments of the sky for short intervals.
- operational necessity, such as intentionally maneuvering the aircraft for a brief period behind an obstruction. There is no specific time interval for which interruption of visual contact is permissible.



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Operating Limits for sUAS

Rules ~ Right of Ways ~ Protecting Non-Participants

- An sUAS is not allowed to be flown faster than 100 mph/87 knots.
- An sUAS cannot be flown higher than 400 feet above ground level (AGL,) unless flown within a 400-foot radius of a structure such as a building or cell tower. Then the remote pilot may fly 400 feet above the uppermost top of the structure providing it does not run into controlled airspace.
- An sUAS cannot be flown lower than 2,000 feet AGL over National Parks, National Monuments, recreational areas, and locations administered by the U.S. Fish and Wildlife Service and the U.S. Forest Service (however, one is not permitted to fly at all within a National Park or Monument without prior authorization).
- The FAA recommend that your sUAS not be flown within 2,000 feet horizontally of a tower that has guy wires.

Operation Near Aircraft / Right of Way Rules

No person may operate a small unmanned aircraft in a manner that interferes with operations and traffic patterns at any airport, heliport, or seaplane base. The remote pilot also has a responsibility to remain clear of, and yield right-of-way to, all other aircraft, manned or unmanned, and avoid other potential hazards that may affect the remote pilot in command's operation of the aircraft. This is traditionally referred to as see and avoid. To satisfy this responsibility, the remote pilot must:

- be aware of other aircraft, persons, and property in the vicinity of the operating area.
- know the location and flight path of his or her small unmanned aircraft at all times.
- be able to maneuver your sUAS to avoid collision and prevent other aircraft from having to take evasive action.



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- avoid operating anywhere where the presence of his or her unmanned aircraft may interfere with operations at an airport such as approach corridors, taxiways, runways, or helipads.
- yield right-of-way to all other aircraft, including aircraft operating on the surface of the airport.

No Operation Over People

You may not commercially operate a small unmanned aircraft weighing over .55 lbs. directly over another person unless that person is:

- directly involved in the operation such as a visual observer or other crewmember.
- within a safe cover such as inside a stationary vehicle or a protective structure that would protect a person.

See: https://www.faa.gov/uas/commercial_operators/operations_over_people

As of April 21, 2021, you may operate a low-risk drone over crowds of uninvolved people providing the drone weighs less than .55 pounds (see more below).

Operations Over People General Overview

The remote pilot needs to take into account the small unmanned aircraft's course, speed, and trajectory, including the possibility of a catastrophic failure, to determine if the small unmanned aircraft would go over or strike a person not directly involved in the flight operation (non-participant).



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In addition, the remote pilot must take steps using a safety risk-based approach to ensure that:

- the small unmanned aircraft does not operate over non-participants who are not under a covered structure or in a stationary covered vehicle;
- the small unmanned aircraft will pose no undue hazard to other aircraft, people, or property in the event of a loss of control of the aircraft for any reason (§ 107.19); and
- the small UAS is not operated in a careless or reckless manner so as to endanger the life or property of another (§ 107.23).

If the remote pilot cannot comply with these requirements, then the flight must not take place or the flight must be immediately and safely terminated.

What are the operations over people categories?

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.



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Category 2

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.

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.

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.



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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.

Protecting Non-Participants

To comply with limitations on sUAS operations near persons not participating in the operation, the remote pilot should employ strategies that protect people uninvolved with the flight such as:

- select an appropriate operational area for the flight ideally, an operational area/site that is sparsely populated.
- if operating in populated areas, make a plan to keep non-participants clear, indoors, or under cover.
- if operating from a moving vehicle, choose a sparsely populated, or underpopulated area, and make a plan to keep your sUAS clear of anyone who may approach.
- adopt an appropriate operating distance from non-participants, and take reasonable precautions to keep the operational area free of non-participants.



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Operation From Moving Vehicles

Part 107 permits operation of a UA from a moving land or water-borne vehicle over a sparsely populated or unpopulated areas, but operation from a moving aircraft is prohibited. Operations from moving vehicles are subject to the same restrictions that apply to all other part 107 sUAS operations.

The remote pilot in command, and the person manipulating the controls if applicable, must still maintain visual line of sight for the sUAS operating from a moving vehicle or watercraft.

Operations over persons not directly involved in the operation of the sUAS, unless under safe cover, are still prohibited.

The visual observer (VO) and remote Pilot must still maintain effective communication.

Careless or reckless operation of an sUAS is still prohibited.

Operating an sUAS while driving a moving vehicle is considered to be careless or reckless, because the driver's attention would be hazardously divided. Therefore, the driver/operator of a land or water-borne vehicle must not serve as the remote PIC, person manipulating the controls, or visual observer. Remember, the remote pilot in command is responsible for everything and everyone, so it's permissible under Part 107 for a remote pilot to be a passenger in a moving vehicle operating a sUAS and the driver does not have to be a crewmember.



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- if operating in populated areas, make a plan to keep non-participants clear, indoors, or under cover.
- if operating from a moving vehicle, choose a sparsely populated, or underpopulated area, and make a plan to keep your sUAS clear of anyone who may approach.
- adopt an appropriate operating distance from non-participants and take reasonable precautions to keep the operational area free of non-participants.

Operation From Moving Vehicles

Part 107 permits operation of a UA from a moving land or water-borne vehicle over a sparsely populated or unpopulated area, but operation from a moving aircraft is prohibited. Operations from moving vehicles are subject to the same restrictions that apply to all other part 107 sUAS operations.

- The remote pilot in command (remote pilot), and the person manipulating the controls if applicable, must still maintain visual line of sight for the sUAS operating from a moving vehicle or watercraft.
- Operations over persons not directly involved in the operation of the sUAS, unless under safe cover, are still prohibited.
- The visual observer (VO) and remote Pilot must still maintain effective communication.
- Careless or reckless operation of an sUAS is still prohibited.
- Use of drones weighing less than .5 lbs. exempt.

See: https://www.faa.gov/uas/commercial_operators/operations_over_people



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Operating an sUAS while driving a moving vehicle is considered to be careless or reckless, because the driver's attention would be hazardously divided. Therefore, the driver/operator of a land or water-borne vehicle must not serve as the remote pilot, person manipulating the controls, or visual observer. Remember, the remote pilot in command is responsible for everything and everyone, so it's permissible under part 107 for a remote pilot to be a passenger in a moving vehicle operating a sUAS and the driver does not have to be a crewmember.

No Operations While Impaired

The remote pilot in command, person manipulating the controls, or visual observer may not perform operations while under the influence of drug or alcohol, including certain over-the-counter medications such as certain antihistamines and decongestants. A person may not serve as any sUAS crewmember if he or she:

- consumed any alcoholic beverage within the preceding 8 hours.
- is under the influence of alcohol.
- has a blood alcohol concentration of .04% or greater.
- is using a drug that affects the person's mental or physical capabilities, including certain antihistamines.
- **How long does it take for one drink to pass through someone's system?
~ 3 hours.**

As you can imagine, the FAA takes DUI and drug offenses seriously so if you are convicted of an alcohol or drug-related offence, pilots face license or certification suspension for up to one year from date of conviction. In addition, refusal to submit to an alcohol or drug test can also result in revocation of license or certificate from date of refusal. While the FAA does not administer alcohol or drug tests directly, refusing a test from a law enforcement officer can result in the same outcome.

Remember this slogan... 8 hours from bottle to throttle!



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Waivers for Operating Under 14 CFR part 107

Certificate of Waiver (CoW)

Part 107 includes the option to apply for a Certificate of Waiver (CoW), which will allow an sUAS operation to deviate from certain provisions of part 107 if the FAA Administrator finds that the proposed operation can be safely conducted under the terms of the submitted CoW. A list of the waivable sections are as follows:

- Operation from a moving vehicle or aircraft. However, no waiver of this provision will be issued to allow the carriage of property of another by aircraft for compensation or hire.
- Daylight operation (request to operate at night – one of the most requested waivers).
- Visual line of sight aircraft operation. However, no waiver of this provision will be issued to allow the carriage of property of another by aircraft for compensation or hire.
- Visual observer.
- Operation of multiple small unmanned aircraft systems.
- Yielding the right of way.
- Operation over people.
- Operation in certain airspace (not the same as controlled airspace).
- Operating limitations for small unmanned aircraft.



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Applying for a Certificate of Waiver

To apply for a certificate of waiver (CoW), the remote pilot must visit www.faa.gov/uas/ and follow the instructions. The application must contain a complete description of the proposed operation and a justification, including supporting data and documentation that establishes that the proposed operation can safely be conducted under the terms of a CoW.

Although not required by part 107, the FAA encourages applicants to submit their application at least 90 days prior to the start of the proposed operation. The FAA will strive to complete review and adjudication of waivers within 90 days; however, the time required for the FAA to make a determination regarding waiver requests will vary based on the complexity of the request. The amount of data and analysis required as part of the application will be proportional to the specific relief that is requested.

If a CoW is granted, that certificate will include specific special provisions designed to ensure that the sUAS operation may be conducted as safely as one conducted under the provisions of part 107, and real-life examples can be reviewed on the FAA website at [waivers granted](#).

Government Entities

Government entities or organizations such as public universities, state governments, law enforcement agencies and local municipalities have two options for operating a small unmanned aircraft system. They may either operate under Title 14 CFR Part 107 or, obtain a Certificate of Waiver of Authorization (COA) to be allowed to operate an sUAS in all Class G airspace below 400 feet Above Ground Level (AGL), self-certification of the sUAS pilot, along with the option to obtain an emergency COA (e-COA) under special circumstances.



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Certification Requirements

- Remote pilots must renew their certification every 24 months by taking the recurrent exam for free at <https://www.faasafety.gov/>.
- Remote pilots who hold a current part 107 certification must notify FAA of a change in address within 30 calendar days. Failure to do so prohibits the remote pilot to commercially operate their sUAS until the FAA has been notified. A change in address can easily be submitted online at the FAA Airmen Services website, which is provided at the end/bottom of this lesson.

Situational Awareness

The remote pilot attains situational awareness by obtaining as much information as possible prior to a flight and becoming familiar with the performance capabilities of the sUAS, weather conditions, surrounding airspace, and Air Traffic Control (ATC) requirements. Sources of information include a weather briefing, ATC, FAA, local pilots, and landowners.

Technology, such as global positioning systems (GPS), mapping systems, and computer applications, can assist in collecting and managing information to improve your situational awareness and risk-based aeronautical decision making (ADM). The hoverapp.io app is a great smartphone app that provides remote pilots the ability to check flight conditions, weather, and temporary flight restrictions.



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Nonregulatory Material

Any officer of the FAA Administrator is allowed to make any test or inspection of your sUAS, the remote pilot in command, your visual observer, your flight logs, or any other documents, records, or reports, including asking to see a copy of your remote pilot certificate, or any other documentation as laid out in Part 107, without advance notice or publication. This is why keeping records of any and all scheduled or unscheduled sUAS maintenance inspections and repairs is important, as well as maintaining flight records as well. Again, when your sUAS manufacturer does not provide instructions pertaining to scheduled maintenance, the owner of the sUAS should create a maintenance log.

Advisory Circulars (AC)

Advisory Circulars refer to a type of publication offered by the Federal Aviation Administration (FAA), and are issued to inform the public of nonregulatory material such as notices or reference materials. FAA Advisory Circulars are available to all pilots via download from the FAA website, and these AC's are not binding. Unless incorporated into a regulation by specific reference, Advisory Circulars (ACs) are organized by subject numbers which are as follows:

- **60 – Airmen**
- **70 – Airspace**
- **90 - Air Traffic and General Operating Rules**



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Falsification, Reproductions, Alterations

Any falsification, reproduction or alteration of records such as the certificate, rating, authorization, record, or report, will not be tolerated by the FAA. No person may make or cause to be made:

- Any fraudulent or intentionally false record or report that is required to be made, kept, or used to show compliance with any requirement under this part.
- Any reproduction or alteration, for fraudulent purpose, of any certificate, rating, authorization, record or report under this part.

Engaging in any of this activity can result in:

- Denial of an application for a remote pilot certificate.
- Denial for a Certificate of Waiver (COV).
- Suspension or revocation of any certificate or waiver; issued by the administrator.
- A civil penalty.

