

sUAS Pilot Ground Training Syllabus

Minimum Total Hours

Total flight: N/A
Total ground: 18.0

Flight lesson Ground lesson Stage check Solo flight Simulator

Sect No	Rev	Title	Specific topics	Notes/Special emphasis	Ground	Flight
02	1	Introduction to sUAS	<ul style="list-style-type: none"> History of the "drone" Definition of an aircraft National Airspace System (NAS) Purpose and privileges of a commercial certificate Definition of pilot-in-command www.dronezone.com www.faasafety.gov iacra.faa.gov 	<ul style="list-style-type: none"> Student should understand the difference between hobby operations and commercial operations Student should understand that their certificate has no expiration date, however the associated operating privileges are only good for two years. Student must understand that he/she is being certificated and must act as the pilot-in-command not their employer or company. 	1.0	N/A
03	1	Federal aviation regulations for sUAS.	<ul style="list-style-type: none"> FAR part 107 and applicable parts of 61 and 91. Definition of airworthy Maintenance and airworthiness directives Obtaining waivers through www.faa.gov/uas/commercial_operators/part_107_waivers/ 	<ul style="list-style-type: none"> Student should understand that Part 107 was specifically written for sUAS, but that parts of 61 and 91 are still applicable. Student should understand that Certificates of Authorization are no longer issued, and have been replaced by Part 107 and waivers 	2.0	N/A
03a	1	Texas Regulations for sUAS	<ul style="list-style-type: none"> Texas Government Code Title 4, Subtitle B, Chapter 423 - Use of Unmanned Aircraft 	<ul style="list-style-type: none"> Individual states and municipalities may hve more restrictive laws governing sUAS operations 	2.0	N/A
04	1	Airports and operational safety	<ul style="list-style-type: none"> Airport signs and markings Aeronautical decision making The five hazardous attitudes Avoidance of manned aircraft Traffic patterns and traffic pattern entry should be explained 	<ul style="list-style-type: none"> Student should be able to read signs and marking Student should memorize the PAVE and IM SAFE checklists Student may elect to use the APE checklist in lieu of the PAVE checklist. Student should memorize hazardous attitudes and antidotes 	2.0	N/A
05	1	Aerodynamics, stability, and turning tendencies	<ul style="list-style-type: none"> General aerodynamics of fixed wing aircraft Aerodynamics of copter style aircraft 	<ul style="list-style-type: none"> Student should understand that he/she is certificated to fly any sUAS system 	2.0	N/A
06	1	Airspace		<ul style="list-style-type: none"> sUAS systems are exempt from cloud clearance, visibility, and equipment requirements. 	1.0	N/A
07	1	Aeronautical charts and supplements		<ul style="list-style-type: none"> UAS facility maps should also be included in this topic 	2.0	N/A
08	1	Performance, Weight, and Balance			2.0	N/A
09	1	Weather Theory			2.0	N/A
10	1	Weather Services	<ul style="list-style-type: none"> Meteorological Aviation Weather Routine Reports Terminal Aerodrome Forecasts 	<ul style="list-style-type: none"> Student should be able to read a METAR and a TAF 	1.0	N/A

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11	1	Emergency procedures and equipment malfunctions		<ul style="list-style-type: none">• Complete only the ground portion of the lesson and tasks.	2.0	N/A
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Introduction to sUAS

Objective	To help the student understand the purpose, importance, and significance of having a commercial sUAS certificate		
Pre-requisites	<ul style="list-style-type: none"> • None 		
Approx. Time	Ground:	1.0	Flight: N/A
Materials	<ul style="list-style-type: none"> <input type="checkbox"/> Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25B (PHAK) <input type="checkbox"/> Model aircraft 		
Ground work	<ul style="list-style-type: none"> <input type="checkbox"/> History of the drone <ul style="list-style-type: none"> ○ Drones are vehicles capable of either piloting themselves or being piloted from a remote station ○ First drones were invented in 1916 as a defense against zeppelins <ul style="list-style-type: none"> ▪ Ruston Proctor Aerial Target (Nikola Tesla) – 1916 ▪ Hewitt-Sperry Automatic Airplane – 1917 ▪ Kettering Bug – 1918 ○ Most drone research was accomplished by the military until <ul style="list-style-type: none"> ▪ In 1930 the U.S. Army Aircorp began experimenting with radio controlled aerial torpedos ▪ In 1941 Reginald Denny invented the first radio plane called the OQ2 ▪ In 1973 Israel developed the mastiff UAV and IAA scout as unpilot surveillance machines ▪ In 1982 Israel used UAVs to stop Syria from invading ▪ In 1990's as solid state electronics became household items, drone technology began to take off ○ In 1991 the internet became publicly available ○ By 2010 technological advances in electrical components became available to the average consumer <ul style="list-style-type: none"> ▪ Smart phones with internet access were now common place ▪ Drone parts (circuitry, motors, batteries, etc) became available to the average consumer ▪ Using the internet people around the world could share ideas and build better drones ○ Notable UAV related incidents (https://en.wikipedia.org/wiki/List_of_UAV-related_incidents) <ul style="list-style-type: none"> ▪ August 2013 – a UAV filming events at the Virginia Bull Run crashed into the crowd of onlookers ▪ January 2015 – a DJI Phantom crashed on the lawn of the White House ▪ June 2015 – A woman watching the Seattle Pride Parade was knocked unconscious by a falling UAV. The operator was the first person convicted in a criminal court of law) ▪ July 2015 – Aerial fire fighting crews were grounded for 26 minutes after five UAVs were seen in the area filming the fire ▪ August 2015 – A police search for a man wanted for assault with a deadly weapon was interrupted when the police helicopter had a near collision with a UAV. ▪ September 2015 – A UAV crashed into Louis Armstrong Stadium in Queens NY. ▪ October 2015 – A UAV collided with power lines in Hollywood causing a 		

	<p>power outage</p> <ul style="list-style-type: none"> ▪ May 2017 – A UAV filming the Golden State Bicycle Race in California collided with a tree and then with one of the participating cyclists. Part of the drone lodged in a bicycle wheel and caused one of the cyclists to flip over his handlebars. <ul style="list-style-type: none"> □ The commercial sUAS certificate <ul style="list-style-type: none"> ○ Regulations governing the part 107 commercial certificate were finalized on June 21, 2016 as a direct result of careless and reckless sUAS operations ○ Purpose is to equip sUAS pilots with the knowledge necessary to operate safely in the NAS. ○ Hobbyists are required to stay at least 5 miles from any airports and below 400ft AGL. ○ Commercial pilots may operate their aircraft in areas that are off-limits to hobbyists □ Definition of an aircraft <ul style="list-style-type: none"> ○ Categories ○ Class ○ sUAS <ul style="list-style-type: none"> ▪ Category: Unmanned Aerial System ▪ Class: Small ▪ At least 0.55 lbs ▪ Less than 55.0 lbs □ The National airspace system (NAS) exists in order to maintain an orderly system where aircraft may operate without colliding with each other □ The pilot-in-command <ul style="list-style-type: none"> ○ FAR 91.3 – PIC <ul style="list-style-type: none"> ▪ Ultimate authority ▪ Sole responsibility ▪ May deviate from any regulation to address and emergency or potential emergency ○ FAR 107.19 – rPIC <ul style="list-style-type: none"> ▪ Must be designated prior to any flight ▪ Directly responsible for and final authority over ▪ Must have the ability to control the sUAS
Tasks	<ul style="list-style-type: none"> □ Review aeronautical knowledge
Notes	<ul style="list-style-type: none"> • N/A
Completion	<p>The lesson is considered complete when the student passes the stage 1 written exam (E01 I.R.) or the FAA Private Pilot Airplane Knowledge Exam with a minimum passing grade of 70%</p>

PART 107—SMALL UNMANNED AIRCRAFT SYSTEMS

Authority: [49 U.S.C. 106\(f\)](#), [40101 note](#), [40103\(b\)](#), [44701\(a\)\(5\)](#), [46105\(c\)](#), [46110](#), [44807](#).

Source: Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, unless otherwise noted.

Subpart A—General

§ 107.1 Applicability.

(a) Except as provided in [paragraph \(b\)](#) of this section, this part applies to the registration, airman certification, and operation of civil small unmanned aircraft systems within the United States. This part also applies to the eligibility of civil small unmanned aircraft systems to operate over human beings in the United States.

(b) This part does not apply to the following:

(1) Air carrier operations;

(2) Any aircraft subject to the provisions of [49 U.S.C. 44809](#);

(3) Any operation that the holder of an exemption under section 333 of [Public Law 112–95](#) or [49 U.S.C. 44807](#) elects to conduct pursuant to the exemption, unless otherwise specified in the exemption; or

(4) Any operation that a person elects to conduct under [part 91 of this chapter](#) with a small unmanned aircraft system that has been issued an airworthiness certificate.

[Amdt. No. 107–8, [86 FR 4381](#), Jan. 15, 2021]

§ 107.2 Applicability of certification procedures for products and articles.

The provisions of [part 21 of this chapter](#) do not apply to small unmanned aircraft systems operated under this part unless the small unmanned aircraft system will operate over human beings in accordance with [§ 107.140](#).

[Amdt. No. 107–8, [86 FR 4381](#), Jan. 15, 2021]

§ 107.3 Definitions.

The following definitions apply to this part. If there is a conflict between the definitions of this part and definitions specified in [§ 1.1 of this chapter](#), the definitions in this part control for purposes of this part:

Control station means an interface used by the remote pilot to control the flight path of the small unmanned aircraft.

Corrective lenses means spectacles or contact lenses.

Declaration of compliance means a record submitted to the FAA that certifies the small unmanned aircraft conforms to the Category 2 or Category 3 requirements under [subpart D of this part](#).

Small unmanned aircraft means an unmanned aircraft weighing less than 55 pounds on takeoff, including everything that is on board or otherwise attached to the aircraft.

Small unmanned aircraft system (small UAS) means a small unmanned aircraft and its associated elements (including communication links and the components that control the small unmanned aircraft) that are required for the safe and efficient operation of the small unmanned aircraft in the national airspace system.

Unmanned aircraft means an aircraft operated without the possibility of direct human intervention from within or on the aircraft.

Visual observer means a person who is designated by the remote pilot in command to assist the remote pilot in command and the person manipulating the flight controls of the small UAS to see and avoid other air traffic or objects aloft or on the ground.

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Amdt. No. 107–8, [86 FR 4381](#), Jan. 15, 2021]

§ 107.5 Falsification, reproduction, or alteration.

(a) No person may make or cause to be made—

(1) 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.

(2) Any reproduction or alteration, for fraudulent purpose, of any certificate, rating, authorization, record or report under this part.

(b) The commission by any person of an act prohibited under [paragraph \(a\)](#) of this section is a basis for any of the following:

(1) Denial of an application for a remote pilot certificate or a certificate of waiver;

(2) Denial of a declaration of compliance;

(3) Suspension or revocation of any certificate, waiver, or declaration of compliance issued or accepted by the Administrator under this part and held by that person; or

(4) A civil penalty.

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Amdt. No. 107–8, [86 FR 4381](#), Jan. 15, 2021]

§ 107.7 Inspection, testing, and demonstration of compliance.

(a) A remote pilot in command, owner, or person manipulating the flight controls of a small unmanned aircraft system must—

(1) Have in that person's physical possession and readily accessible the remote pilot certificate with a small UAS rating and identification when exercising the privileges of that remote pilot certificate.

(2) Present his or her remote pilot certificate with a small UAS rating and identification that contains the information listed at [§ 107.67\(b\)\(1\)](#) through [\(3\)](#) for inspection upon a request from—

(i) The Administrator;

(ii) An authorized representative of the National Transportation Safety Board;

(iii) Any Federal, State, or local law enforcement officer; or

(iv) An authorized representative of the Transportation Security Administration.

(3) Make available, upon request, to the Administrator any document, record, or report required to be kept under the regulations of this chapter.

(b) The remote pilot in command, visual observer, owner, operator, or person manipulating the flight controls of a small unmanned aircraft system must, upon request, allow the Administrator to make any test or inspection of the small unmanned aircraft system, the remote pilot in command, the person manipulating the flight controls of a small unmanned aircraft system, and, if applicable, the visual observer to determine compliance with this part.

(c) Any person holding an FAA-accepted declaration of compliance under [subpart D of this part](#) must, upon request, make available to the Administrator:

(1) The declaration of compliance required under [subpart D of this part](#); and

(2) Any other document, record, or report required to be kept under the regulations of this chapter.

(d) Any person holding an FAA-accepted declaration of compliance under [subpart D of this part](#) must, upon request, allow the Administrator to inspect its facilities, technical data, and any manufactured small UAS and witness any tests necessary to determine compliance with that subpart.

[Amdt. No. 107–8, [86 FR 4381](#), Jan. 15, 2021]

§ 107.9 Safety event reporting.

No later than 10 calendar days after an operation that meets the criteria of either [paragraph \(a\)](#) or [\(b\)](#) of this section, a remote pilot in command must report to the FAA, in a manner acceptable to the Administrator, any operation of the small unmanned aircraft involving at least:

(a) Serious injury to any person or any loss of consciousness; or

(b) Damage to any property, other than the small unmanned aircraft, unless one of the following conditions is satisfied:

(1) The cost of repair (including materials and labor) does not exceed \$500; or

(2) The fair market value of the property does not exceed \$500 in the event of total loss.

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Docket No. FAA–2022–1355; Amdt. No. 107–10; [87 FR 75846](#), Dec. 9 2022]

Subpart B—Operating Rules

§ 107.11 Applicability.

This subpart applies to the operation of all civil small unmanned aircraft systems subject to this part.

§ 107.12 Requirement for a remote pilot certificate with a small UAS rating.

(a) Except as provided in [paragraph \(c\)](#) of this section, no person may manipulate the flight controls of a small unmanned aircraft system unless:

(1) That person has a remote pilot certificate with a small UAS rating issued pursuant to [subpart C of this part](#) and satisfies the requirements of [§ 107.65](#); or

(2) That person is under the direct supervision of a remote pilot in command and the remote pilot in command has the ability to immediately take direct control of the flight of the small unmanned aircraft.

(b) Except as provided in [paragraph \(c\)](#) of this section, no person may act as a remote pilot in command unless that person has a remote pilot certificate with a small UAS rating issued pursuant to [Subpart C of this part](#) and satisfies the requirements of [§ 107.65](#).

(c) The Administrator may, consistent with international standards, authorize an airman to operate a civil foreign-registered small unmanned aircraft without an FAA-issued remote pilot certificate with a small UAS rating.

§ 107.13 Registration.

A person operating a civil small unmanned aircraft system for purposes of flight must comply with the provisions of [§ 91.203\(a\)\(2\) of this chapter](#). (Registration is under FAR 47 and FAR 48. Must be affixed to the aircraft and may not be registered in more than one country at a time. An aircraft bill of sale is valid for 90 days.)

§ 107.15 Condition for safe operation.

(a) No person may operate a civil small unmanned aircraft system unless it is in a condition for safe operation. Prior to each flight, the remote pilot in command must check the small unmanned aircraft system to determine whether it is in a condition for safe operation.

(b) No person may continue flight of the small unmanned aircraft when he or she knows or has reason to know that the small unmanned aircraft system is no longer in a condition for safe operation.

§ 107.17 Medical condition.

No person may manipulate the flight controls of a small unmanned aircraft system or act as a remote pilot in command, visual observer, or direct participant in the operation of the small unmanned aircraft if he or she knows or has reason to know that he or she has a physical or mental condition that would interfere with the safe operation of the small unmanned aircraft system.

§ 107.19 Remote pilot in command.

(a) A remote pilot in command must be designated before or during the flight of the small unmanned aircraft.

(b) The remote pilot in command is directly responsible for and is the final authority as to the operation of the small unmanned aircraft system.

(c) The remote pilot in command must ensure that the small unmanned aircraft will pose no undue hazard to other people, other aircraft, or other property in the event of a loss of control of the small unmanned aircraft for any reason.

(d) The remote pilot in command must ensure that the small UAS operation complies with all applicable regulations of this chapter.

(e) The remote pilot in command must have the ability to direct the small unmanned aircraft to ensure compliance with the applicable provisions of this chapter.

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021]

§ 107.21 In-flight emergency.

(a) In an in-flight emergency requiring immediate action, the remote pilot in command may deviate from any rule of this part to the extent necessary to meet that emergency.

(b) Each remote pilot in command who deviates from a rule under [paragraph \(a\)](#) of this section must, upon request of the Administrator, send a written report of that deviation to the Administrator.

§ 107.23 Hazardous operation.

No person may:

(a) Operate a small unmanned aircraft system in a careless or reckless manner so as to endanger the life or property of another; or

(b) Allow an object to be dropped from a small unmanned aircraft in a manner that creates an undue hazard to persons or property.

§ 107.25 Operation from a moving vehicle or aircraft.

No person may operate a small unmanned aircraft system—

(a) From a moving aircraft; or

(b) From a moving land or water-borne vehicle unless the small unmanned aircraft is flown over a sparsely populated area and is not transporting another person's property for compensation or hire.

§ 107.27 Alcohol or drugs.

A person manipulating the flight controls of a small unmanned aircraft system or acting as a remote pilot in command or visual observer must comply with the provisions of [§§ 91.17](#) and [91.19 of this chapter](#).

§ 107.29 Operation at night.

(a) Except as provided in [paragraph \(d\)](#) of this section, no person may operate a small unmanned aircraft system at night unless—

(1) The remote pilot in command of the small unmanned aircraft has completed an initial knowledge test or training, as applicable, under [§ 107.65](#) after April 6, 2021; and

(2) The small unmanned aircraft has lighted anti-collision lighting visible for at least 3 statute miles that has a flash rate sufficient to avoid a collision. The remote pilot in command may reduce the intensity of, but may not extinguish, the anti-collision lighting if he or she determines that, because of operating conditions, it would be in the interest of safety to do so.

(b) No person may operate a small unmanned aircraft system during periods of civil twilight unless the small unmanned aircraft has lighted anti-collision lighting visible for at least 3 statute miles that has a flash rate sufficient to avoid a collision. The remote pilot in command may reduce the intensity of, but may not extinguish, the anti-collision lighting if he or she determines that, because of operating conditions, it would be in the interest of safety to do so.

(c) For purposes of [paragraph \(b\)](#) of this section, civil twilight refers to the following:

(1) Except for Alaska, a period of time that begins 30 minutes before official sunrise and ends at official sunrise;

(2) Except for Alaska, a period of time that begins at official sunset and ends 30 minutes after official sunset; and

(3) In Alaska, the period of civil twilight as defined in the Air Almanac.

(d) After May 17, 2021, no person may operate a small unmanned aircraft system at night in accordance with a certificate of waiver issued prior to April 21, 2021 under [§ 107.200](#). The certificates of waiver issued prior to March 16, 2021 under [§ 107.200](#) that authorize deviation from [§ 107.29](#) terminate on May 17, 2021.

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021; [86 FR 13631](#), Mar. 10, 2020]

§ 107.31 Visual line of sight aircraft operation.

(a) With vision that is unaided by any device other than corrective lenses, the remote pilot in command, the visual observer (if one is used), and the person manipulating the flight control of

the small unmanned aircraft system must be able to see the unmanned aircraft throughout the entire flight in order to:

- (1) Know the unmanned aircraft's location;
- (2) Determine the unmanned aircraft's attitude, altitude, and direction of flight;
- (3) Observe the airspace for other air traffic or hazards; and
- (4) Determine that the unmanned aircraft does not endanger the life or property of another.

(b) Throughout the entire flight of the small unmanned aircraft, the ability described in [paragraph \(a\)](#) of this section must be exercised by either:

- (1) The remote pilot in command and the person manipulating the flight controls of the small unmanned aircraft system; or
- (2) A visual observer.

§ 107.33 Visual observer.

If a visual observer is used during the aircraft operation, all of the following requirements must be met:

(a) The remote pilot in command, the person manipulating the flight controls of the small unmanned aircraft system, and the visual observer must maintain effective communication with each other at all times.

(b) The remote pilot in command must ensure that the visual observer is able to see the unmanned aircraft in the manner specified in [§ 107.31](#).

(c) The remote pilot in command, the person manipulating the flight controls of the small unmanned aircraft system, and the visual observer must coordinate to do the following:

- (1) Scan the airspace where the small unmanned aircraft is operating for any potential collision hazard; and
- (2) Maintain awareness of the position of the small unmanned aircraft through direct visual observation.

§ 107.35 Operation of multiple small unmanned aircraft.

A person may not manipulate flight controls or act as a remote pilot in command or visual observer in the operation of more than one unmanned aircraft at the same time.

[Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021]

§ 107.36 Carriage of hazardous material.

A small unmanned aircraft may not carry hazardous material. For purposes of this section, the term hazardous material is defined in [49 CFR 171.8](#).

§ 107.37 Operation near aircraft; right-of-way rules.

(a) Each small unmanned aircraft must yield the right of way to all aircraft, airborne vehicles, and launch and reentry vehicles. Yielding the right of way means that the small unmanned aircraft must give way to the aircraft or vehicle and may not pass over, under, or ahead of it unless well clear.

(b) No person may operate a small unmanned aircraft so close to another aircraft as to create a collision hazard.

§ 107.39 Operation over human beings.

No person may operate a small unmanned aircraft over a human being unless—

(a) That human being is directly participating in the operation of the small unmanned aircraft;

(b) That human being is located under a covered structure or inside a stationary vehicle that can provide reasonable protection from a falling small unmanned aircraft; or

(c) The operation meets the requirements of at least one of the operational categories specified in [subpart D of this part](#).

[Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021]

§ 107.41 Operation in certain airspace.

No person may operate a small unmanned aircraft in Class B, Class C, or Class D airspace or within the lateral boundaries of the surface area of Class E airspace designated for an airport unless that person has prior authorization from Air Traffic Control (ATC).

§ 107.43 Operation in the vicinity of airports.

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.

§ 107.45 Operation in prohibited or restricted areas.

No person may operate a small unmanned aircraft in prohibited or restricted areas unless that person has permission from the using or controlling agency, as appropriate.

§ 107.47 Flight restrictions in the proximity of certain areas designated by notice to airmen.

A person acting as a remote pilot in command must comply with the provisions of [§§ 91.137](#) through [91.145](#) and [99.7 of this chapter](#).

§ 107.49 Preflight familiarization, inspection, and actions for aircraft operation.

Prior to flight, the remote pilot in command must:

- (a) Assess the operating environment, considering risks to persons and property in the immediate vicinity both on the surface and in the air. This assessment must include:
 - (1) Local weather conditions;
 - (2) Local airspace and any flight restrictions;
 - (3) The location of persons and property on the surface; and
 - (4) Other ground hazards.
- (b) Ensure that all persons directly participating in the small unmanned aircraft operation are informed about the operating conditions, emergency procedures, contingency procedures, roles and responsibilities, and potential hazards;
- (c) Ensure that all control links between ground control station and the small unmanned aircraft are working properly;
- (d) If the small unmanned aircraft is powered, ensure that there is enough available power for the small unmanned aircraft system to operate for the intended operational time;
- (e) Ensure that any object attached or carried by the small unmanned aircraft is secure and does not adversely affect the flight characteristics or controllability of the aircraft; and
- (f) If the operation will be conducted over human beings under [subpart D of this part](#), ensure that the aircraft meets the requirements of [§ 107.110](#), [§ 107.120\(a\)](#), [§ 107.130\(a\)](#), or [§ 107.140](#), as applicable.

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021]

§ 107.51 Operating limitations for small unmanned aircraft.

A remote pilot in command and the person manipulating the flight controls of the small unmanned aircraft system must comply with all of the following operating limitations when operating a small unmanned aircraft system:

- (a) The groundspeed of the small unmanned aircraft may not exceed 87 knots (100 miles per hour).
- (b) The altitude of the small unmanned aircraft cannot be higher than 400 feet above ground level, unless the small unmanned aircraft:
 - (1) Is flown within a 400-foot radius of a structure; and
 - (2) Does not fly higher than 400 feet above the structure's immediate uppermost limit.
- (c) The minimum flight visibility, as observed from the location of the control station must be no less than 3 statute miles. For purposes of this section, flight visibility means the average slant distance from the control station at which prominent unlighted objects may be seen and identified by day and prominent lighted objects may be seen and identified by night.
- (d) The minimum distance of the small unmanned aircraft from clouds must be no less than:
 - (1) 500 feet below the cloud; and
 - (2) 2,000 feet horizontally from the cloud.

Subpart C—Remote Pilot Certification

§ 107.52 ATC transponder equipment prohibition.

NOTE: Under FAR 89 – Remote Identification of Unmanned Aircraft requires all UAVs to have an RFID transmitter as of September 2023. This rule began being enforced in March 2024.

Unless otherwise authorized by the Administrator, no person may operate a small unmanned aircraft system under this part with a transponder on.

[Amdt. No. 107–7, [86 FR 4513](#), Jan. 15, 2021]

§ 107.53 Automatic Dependent Surveillance-Broadcast (ADS–B) Out prohibition.

Unless otherwise authorized by the Administrator, no person may operate a small unmanned aircraft system under this part with ADS–B Out equipment in transmit mode.

[Amdt. No. 107–7, [86 FR 4513](#), Jan. 15, 2021]

§ 107.56 Applicability.

This subpart prescribes the requirements for issuing a remote pilot certificate with a small UAS rating.

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016. Redesignated by Amdt. No. 107–7, [86 FR 4513](#), Jan. 15, 2021]

§ 107.57 Offenses involving alcohol or drugs.

(a) A conviction for the violation of any Federal or State statute relating to the growing, processing, manufacture, sale, disposition, possession, transportation, or importation of narcotic drugs, marijuana, or depressant or stimulant drugs or substances is grounds for:

(1) Denial of an application for a remote pilot certificate with a small UAS rating for a period of up to 1 year after the date of final conviction; or

(2) Suspension or revocation of a remote pilot certificate with a small UAS rating.

(b) Committing an act prohibited by [§ 91.17\(a\)](#) or [§ 91.19\(a\) of this chapter](#) is grounds for:

(1) Denial of an application for a remote pilot certificate with a small UAS rating for a period of up to 1 year after the date of that act; or

(2) Suspension or revocation of a remote pilot certificate with a small UAS rating.

§ 107.59 Refusal to submit to an alcohol test or to furnish test results.

A refusal to submit to a test to indicate the percentage by weight of alcohol in the blood, when requested by a law enforcement officer in accordance with [§ 91.17\(c\) of this chapter](#), or a refusal to furnish or authorize the release of the test results requested by the Administrator in accordance with [§ 91.17\(c\)](#) or [\(d\) of this chapter](#), is grounds for:

(a) Denial of an application for a remote pilot certificate with a small UAS rating for a period of up to 1 year after the date of that refusal; or

(b) Suspension or revocation of a remote pilot certificate with a small UAS rating.

§ 107.61 Eligibility.

Subject to the provisions of §§ [107.57](#) and [107.59](#), in order to be eligible for a remote pilot certificate with a small UAS rating under this subpart, a person must:

- (a) Be at least 16 years of age;
- (b) Be able to read, speak, write, and understand the English language. If the applicant is unable to meet one of these requirements due to medical reasons, the FAA may place such operating limitations on that applicant's certificate as are necessary for the safe operation of the small unmanned aircraft;
- (c) Not know or have reason to know that he or she has a physical or mental condition that would interfere with the safe operation of a small unmanned aircraft system; and
- (d) Demonstrate aeronautical knowledge by satisfying one of the following conditions, in a manner acceptable to the Administrator:
 - (1) Pass an initial aeronautical knowledge test covering the areas of knowledge specified in § [107.73](#); or
 - (2) If a person holds a pilot certificate (other than a student pilot certificate) issued under [part 61 of this chapter](#) and meets the flight review requirements specified in § [61.56](#), complete training covering the areas of knowledge specified in § [107.74](#).

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021]

§ 107.63 Issuance of a remote pilot certificate with a small UAS rating.

An applicant for a remote pilot certificate with a small UAS rating under this subpart must make the application in a form and manner acceptable to the Administrator.

- (a) The application must include either:
 - (1) Evidence showing that the applicant passed an initial aeronautical knowledge test. If applying using a paper application, this evidence must be an airman knowledge test report showing passage of the knowledge test; or
 - (2) If a person holds a pilot certificate (other than a student pilot certificate) issued under [part 61 of this chapter](#) and meets the flight review requirements specified in § [61.56](#), a certificate of completion of an initial training course under this part that covers the areas of knowledge specified in § [107.74](#).
- (b) If the application is being made pursuant to [paragraph \(a\)\(2\)](#) of this section:

- (1) The application must be submitted to the responsible Flight Standards office, a designated pilot examiner, an airman certification representative for a pilot school, a certificated flight instructor, or other person authorized by the Administrator;
- (2) The person accepting the application submission must verify the identity of the applicant in a manner acceptable to the Administrator; and
- (3) The person making the application must, by logbook endorsement or other manner acceptable to the Administrator, show the applicant meets the flight review requirements specified in [§ 61.56 of this chapter](#).

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Docket FAA–2018–0119, Amdt. 107–2, [83 FR 9172](#), Mar. 5, 2018; Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021]]

§ 107.64 Temporary certificate.

- (a) A temporary remote pilot certificate with a small UAS rating is issued for up to 120 calendar days, at which time a permanent certificate will be issued to a person whom the Administrator finds qualified under this part.
- (b) A temporary remote pilot certificate with a small UAS rating expires:
 - (1) On the expiration date shown on the certificate;
 - (2) Upon receipt of the permanent certificate; or
 - (3) Upon receipt of a notice that the certificate sought is denied or revoked.

§ 107.65 Aeronautical knowledge recency.

Note: www.faa.gov – ALC-677: Part 107 Small UAS Recurrent for recurrent training.

A person may not exercise the privileges of a remote pilot in command with small UAS rating unless that person has accomplished one of the following in a manner acceptable to the Administrator within the previous 24 calendar months:

- (a) Passed an initial aeronautical knowledge test covering the areas of knowledge specified in [§ 107.73](#);
- (b) Completed recurrent training covering the areas of knowledge specified in [§ 107.73](#); or
- (c) If a person holds a pilot certificate (other than a student pilot certificate) issued under [part 61 of this chapter](#) and meets the flight review requirements specified in [§ 61.56](#), completed training covering the areas of knowledge specified in [§ 107.74](#).

(d) A person who has passed a recurrent aeronautical knowledge test in a manner acceptable to the Administrator or who has satisfied the training requirement of [paragraph \(c\)](#) of this section prior to April 6, 2021 within the previous 24 calendar months is considered to be in compliance with the requirement of [paragraph \(b\)](#) or [\(c\)](#) of this section, as applicable.

[Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021; [86 FR 13631](#), Mar. 10, 2021]

§ 107.67 Knowledge tests: General procedures and passing grades.

(a) Knowledge tests prescribed by or under this part are given by persons and in the manner designated by the Administrator.

(b) An applicant for a knowledge test must have proper identification at the time of application that contains the applicant's:

(1) Photograph;

(2) Signature;

(3) Date of birth, which shows the applicant meets or will meet the age requirements of this part for the certificate and rating sought before the expiration date of the airman knowledge test report; and

(4) Permanent mailing address. If the applicant's permanent mailing address is a post office box number, then the applicant must also provide a current residential address.

(c) The minimum passing grade for the knowledge test will be specified by the Administrator.

§ 107.69 Knowledge tests: Cheating or other unauthorized conduct.

(a) An applicant for a knowledge test may not:

(1) Copy or intentionally remove any knowledge test;

(2) Give to another applicant or receive from another applicant any part or copy of a knowledge test;

(3) Give or receive assistance on a knowledge test during the period that test is being given;

(4) Take any part of a knowledge test on behalf of another person;

(5) Be represented by, or represent, another person for a knowledge test;

(6) Use any material or aid during the period that the test is being given, unless specifically authorized to do so by the Administrator; and

(7) Intentionally cause, assist, or participate in any act prohibited by this paragraph.

(b) An applicant who the Administrator finds has committed an act prohibited by [paragraph \(a\)](#) of this section is prohibited, for 1 year after the date of committing that act, from:

(1) Applying for any certificate, rating, or authorization issued under this chapter; and

(2) Applying for and taking any test under this chapter.

(c) Any certificate or rating held by an applicant may be suspended or revoked if the Administrator finds that person has committed an act prohibited by [paragraph \(a\)](#) of this section.

§ 107.71 Retesting after failure.

An applicant for a knowledge test who fails that test may not reapply for the test for 14 calendar days after failing the test.

§ 107.73 Knowledge and training.

An initial aeronautical knowledge test and recurrent training covers the following areas of knowledge:

(a) Applicable regulations relating to small unmanned aircraft system rating privileges, limitations, and flight operation;

(b) Airspace classification, operating requirements, and flight restrictions affecting small unmanned aircraft operation;

(c) Aviation weather sources and effects of weather on small unmanned aircraft performance;

(d) Small unmanned aircraft loading;

(e) Emergency procedures;

(f) Crew resource management;

(g) Radio communication procedures;

(h) Determining the performance of the small unmanned aircraft;

(i) Physiological effects of drugs and alcohol;

- (j) Aeronautical decision-making and judgment;
- (k) Airport operations;
- (l) Maintenance and preflight inspection procedures; and
- (m) Operation at night.

[Amdt. No. 107–8, [86 FR 4383](#), Jan. 15, 2021]

§ 107.74 Small unmanned aircraft system training.

Training for pilots who hold a pilot certificate (other than a student pilot certificate) issued under [part 61 of this chapter](#) and meet the flight review requirements specified in [§ 61.56](#) covers the following areas of knowledge:

- (a) Applicable regulations relating to small unmanned aircraft system rating privileges, limitations, and flight operation;
- (b) Effects of weather on small unmanned aircraft performance;
- (c) Small unmanned aircraft loading;
- (d) Emergency procedures;
- (e) Crew resource management;
- (f) Determining the performance of the small unmanned aircraft;
- (g) Maintenance and preflight inspection procedures; and
- (h) Operation at night.

[Amdt. No. 107–8, [86 FR 4383](#), Jan. 15, 2021]

§ 107.77 Change of name or address.

- (a) *Change of name.* An application to change the name on a certificate issued under this subpart must be accompanied by the applicant's:
 - (1) Remote pilot certificate with small UAS rating; and
 - (2) A copy of the marriage license, court order, or other document verifying the name change.

(b) The documents in [paragraph \(a\)](#) of this section will be returned to the applicant after inspection.

(c) **Change of address.** The holder of a remote pilot certificate with small UAS rating issued under this subpart who has made a change in permanent mailing address may not, after 30 days from that date, exercise the privileges of the certificate unless the holder has notified the FAA of the change in address using one of the following methods:

(1) By letter to the FAA Airman Certification Branch, P.O. Box 25082, Oklahoma City, OK 73125 providing the new permanent mailing address, or if the permanent mailing address includes a post office box number, then the holder's current residential address; or

(2) By using the FAA Web site portal at www.faa.gov providing the new permanent mailing address, or if the permanent mailing address includes a post office box number, then the holder's current residential address.

§ 107.79 Voluntary surrender of certificate.

(a) The holder of a certificate issued under this subpart may voluntarily surrender it for cancellation.

(b) Any request made under [paragraph \(a\)](#) of this section must include the following signed statement or its equivalent: “I voluntarily surrender my remote pilot certificate with a small UAS rating for cancellation. This request is made for my own reasons, with full knowledge that my certificate will not be reissued to me unless I again complete the requirements specified in [§§ 107.61](#) and [107.63](#).”

Subpart D—Operations Over Human Beings

Source: Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021

§ 107.100 Applicability.

This subpart prescribes the eligibility and operating requirements for civil small unmanned aircraft to operate over human beings or over moving vehicles in the United States, in addition to those operations permitted by [§ 107.39\(a\)](#) and [\(b\)](#).

§ 107.105 Limitations on operations over human beings.

Except as provided in [§§ 107.39\(a\)](#) and [\(b\)](#) and [107.145](#), a remote pilot in command may conduct operations over human beings only in accordance with the following, as applicable: [§ 107.110](#) for Category 1 operations; [§§ 107.115](#) and [107.120](#) for Category 2 operations; [§§ 107.125](#) and [107.130](#) for Category 3 operations; or [§ 107.140](#) for Category 4 operations.

§ 107.110 Category 1 operations.

To conduct Category 1 operations—

(a) A remote pilot in command must use a small unmanned aircraft that—

(1) Weighs 0.55 pounds or less on takeoff and throughout the duration of each operation under Category 1, including everything that is on board or otherwise attached to the aircraft; and

(2) Does not contain any exposed rotating parts that would lacerate human skin upon impact with a human being.

(b) No remote pilot in command may operate a small unmanned aircraft in sustained flight over open-air assemblies of human beings unless the operation meets the requirements of either [§ 89.110](#) or [§ 89.115\(a\) of this chapter](#).

[Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021, as amended by [86 FR 62473](#), Nov. 10, 2021]

§ 107.115 Category 2 operations: Operating requirements.

To conduct Category 2 operations—

(a) A remote pilot in command must use a small unmanned aircraft that—

(1) Is eligible for Category 2 operations pursuant to [§ 107.120\(a\)](#);

(2) Is listed on an FAA-accepted declaration of compliance as eligible for Category 2 operations in accordance with [§ 107.160](#); and

(3) Is labeled as eligible to conduct Category 2 operations in accordance with [§ 107.120\(b\)\(1\)](#).

(b) No remote pilot in command may operate a small unmanned aircraft in sustained flight over open-air assemblies of human beings unless the operation meets the requirements of either [§ 89.110](#) or [§ 89.115\(a\) of this chapter](#).

§ 107.120 Category 2 operations: Eligibility of small unmanned aircraft and other applicant requirements.

(a) To be eligible for use in Category 2 operations, the small unmanned aircraft must be designed, produced, or modified such that it—

(1) Will not cause injury to a human being that is equivalent to or greater than the severity of injury caused by a transfer of 11 foot-pounds of kinetic energy upon impact from a rigid object;

(2) Does not contain any exposed rotating parts that would lacerate human skin upon impact with a human being; and

(3) Does not contain any safety defects.

(b) The applicant for a declaration of compliance for a small unmanned aircraft that is eligible for use in Category 2 operations in accordance with [paragraph \(a\)](#) of this section, must meet all of the following requirements for the applicant's unmanned aircraft to be used in Category 2 operations:

(1) Display a label on the small unmanned aircraft indicating eligibility to conduct Category 2 operations. The label must be in English and be legible, prominent, and permanently affixed to the small unmanned aircraft.

(2) Have remote pilot operating instructions that apply to the operation of the small unmanned aircraft system. The applicant for a declaration of compliance must make available these instructions upon sale or transfer of the aircraft or use of the aircraft by someone other than the applicant who submitted a declaration of compliance pursuant to [§ 107.160](#). Such instructions must address, at a minimum—

(i) A system description that includes the required small unmanned aircraft system components, any system limitations, and the declared category or categories of operation;

(ii) Modifications that will not change the ability of the small unmanned aircraft system to meet the requirements for the category or categories of operation the small unmanned aircraft system is eligible to conduct; and

(iii) Instructions for how to verify and change the mode or configuration of the small unmanned aircraft system, if they are variable.

(3) Maintain a product support and notification process. The applicant for a declaration of compliance must maintain product support and notification procedures to notify the public and the FAA of—

(i) Any defect or condition that causes the small unmanned aircraft to no longer meet the requirements of this subpart; and

(ii) Any identified safety defect that causes the small unmanned aircraft to exceed a low probability of casualty.

§ 107.125 Category 3 operations: Operating requirements.

To conduct Category 3 operations, a remote pilot in command—

(a) Must use a small unmanned aircraft that—

(1) Is eligible for Category 3 operations pursuant to [§ 107.130\(a\)](#);

(2) Is listed on an FAA-accepted declaration of compliance as eligible for Category 3 operations in accordance with [§ 107.160](#); and

(3) Is labeled as eligible for Category 3 operations in accordance with [§ 107.130\(b\)\(1\)](#);

(b) Must not operate the small unmanned aircraft over open-air assemblies of human beings; and

(c) May only operate the small unmanned aircraft above any human being if operation meets one of the following conditions:

(1) The operation is within or over a closed- or restricted-access site and all human beings located within the closed- or restricted-access site must be on notice that a small unmanned aircraft may fly over them; or

(2) The small unmanned aircraft does not maintain sustained flight over any human being unless that human being is—

(i) Directly participating in the operation of the small unmanned aircraft; or

(ii) Located under a covered structure or inside a stationary vehicle that can provide reasonable protection from a falling small unmanned aircraft.

[Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021, as amended by [86 FR 62473](#), Nov. 10, 2021]

§ 107.130 Category 3 operations: Eligibility of small unmanned aircraft and other applicant requirements.

(a) To be eligible for use in Category 3 operations, the small unmanned aircraft must be designed, produced, or modified such that it—

(1) Will not cause injury to a human being that is equivalent to or greater than the severity of the injury caused by a transfer of 25 foot-pounds of kinetic energy upon impact from a rigid object;

(2) Does not contain any exposed rotating parts that would lacerate human skin upon impact with a human being; and

(3) Does not contain any safety defects.

(b) The applicant for a declaration of compliance for a small unmanned aircraft that is eligible for use in Category 3 operations in accordance with [paragraph \(a\)](#) of this section, must meet all of the following requirements for the applicant's small unmanned aircraft to be used in Category 3 operations:

(1) Display a label on the small unmanned aircraft indicating eligibility to conduct Category 3 operations. The label must be in English and be legible, prominent, and permanently affixed to the small unmanned aircraft.

(2) Have remote pilot operating instructions that apply to the operation of the small unmanned aircraft system. The applicant for a declaration of compliance must make available these instructions upon sale or transfer of the aircraft or use of the aircraft by someone other than the applicant who submitted a declaration of compliance pursuant to [§ 107.160](#). Such instructions must address, at a minimum—

(i) A system description that includes the required small unmanned aircraft system components, any system limitations, and the declared category or categories of operation;

(ii) Modifications that will not change the ability of the small unmanned aircraft system to meet the requirements for the category or categories of operation the small unmanned aircraft system is eligible to conduct; and

(iii) Instructions for how to verify and change the mode or configuration of the small unmanned aircraft system, if they are variable.

(3) Maintain a product support and notification process. The applicant for a declaration of compliance must maintain product support and notification procedures to notify the public and the FAA of—

(i) Any defect or condition that causes the small unmanned aircraft to no longer meet the requirements of this subpart; and

(ii) Any identified safety defect that causes the small unmanned aircraft to exceed a low probability of fatality.

§ 107.135 Labeling by remote pilot in command for Category 2 and 3 operations.

If a Category 2 or Category 3 label affixed to a small unmanned aircraft is damaged, destroyed, or missing, a remote pilot in command must label the aircraft in English such that the label is legible, prominent, and will remain on the small unmanned aircraft for the duration of the operation before conducting operations over human beings. The label must correctly identify the category or categories of operation over human beings that the small unmanned aircraft is qualified to conduct in accordance with this subpart.

§ 107.140 Category 4 operations.

(a) **Remote pilot in command requirements.** To conduct Category 4 operations—

(1) A remote pilot in command—

(i) Must use a small unmanned aircraft that is eligible for Category 4 operations pursuant to [paragraph \(b\)](#) of this section; and

(ii) Must operate the small unmanned aircraft in accordance with all operating limitations that apply to the small unmanned aircraft, as specified by the Administrator.

(2) No remote pilot in command may operate a small unmanned aircraft in sustained flight over open-air assemblies of human beings unless the operation meets the requirements of either [§ 89.110](#) or [§ 89.115\(a\) of this chapter](#).

(b) **Small unmanned aircraft requirements for Category 4.** To be eligible to operate over human beings under this section, the small unmanned aircraft must—

(1) Have an airworthiness certificate issued under [part 21 of this chapter](#).

(2) Be operated in accordance with the operating limitations specified in the approved Flight Manual or as otherwise specified by the Administrator. The operating limitations must not prohibit operations over human beings.

(3) Have maintenance, preventive maintenance, alterations, or inspections performed in accordance with [paragraph \(c\)\(1\)](#) of this section.

(c) **Maintenance requirements for Category 4.** The owner must (unless the owner enters into an agreement with an operator to meet the requirements of this [paragraph \(c\)](#), then the operator must) meet the requirements of this [paragraph \(c\)](#):

(1) Ensure the person performing any maintenance, preventive maintenance, alterations, or inspections:

(i) Uses the methods, techniques, and practices prescribed in the manufacturer's current maintenance manual or Instructions for Continued Airworthiness that are acceptable to the Administrator, or other methods, techniques, and practices acceptable to the Administrator;

(ii) Has the knowledge, skill, and appropriate equipment to perform the work;

(iii) Performs the maintenance, preventive maintenance, or alterations on the small unmanned aircraft in a manner using the methods, techniques, and practices prescribed in the manufacturer's current maintenance manual or Instructions for Continued Airworthiness prepared by its manufacturer, or other methods, techniques, and practices acceptable to the Administrator;

(iv) Inspects the small unmanned aircraft in accordance with the manufacturer's instructions or other instructions acceptable to the Administrator; and

(v) Performs the maintenance, preventive maintenance, or alterations using parts of such a quality that the condition of the aircraft will be at least equal to its original or properly altered condition.

(2) Maintain all records of maintenance, preventive maintenance, and alterations performed on the aircraft and ensure the records are documented in a manner acceptable to the Administrator. The records must contain the description of the work performed, the date the work was completed, and the name of the person who performed the work.

(3) Maintain all records containing—

(i) The status of life-limited parts that are installed on, or part of, the small unmanned aircraft;

(ii) The inspection status of the aircraft; and

(iii) The status of applicable airworthiness directives including the method of compliance, the airworthiness directive number, and revision date. If the airworthiness directive involves recurring action, the record must contain the time and date of the next required action.

(4) Retain the records required under [paragraphs \(c\)\(2\)](#) and [\(3\)](#) of this section, as follows:

(i) The records documenting maintenance, preventive maintenance, or alterations performed must be retained for 1 year from when the work is completed or until the maintenance is repeated or superseded by other work.

(ii) The records documenting the status of life-limited parts, compliance with airworthiness directives, and inspection status of the small unmanned aircraft must be retained and transferred with the aircraft upon change in ownership.

(5) Ensure all records under [paragraphs \(c\)\(2\)](#) and [\(3\)](#) of this section are available for inspection upon request from the Administrator or any authorized representative of the National Transportation Safety Board (NTSB).

(d) *Compliance with [parts 43 and 91 of this chapter](#).* Compliance with part 43 and part 91, subpart E, of this chapter fulfills the requirements in [paragraphs \(b\)\(3\)](#) and [\(c\)](#) of this section.

[Amdt. No. 107–8, [86 FR 4383](#), Jan. 15, 2021; [86 FR 13633](#), Mar. 10, 2021]

§ 107.145 Operations over moving vehicles.

No person may operate a small unmanned aircraft over a human being located inside a moving vehicle unless the following conditions are met:

(a) The operation occurs in accordance with [§ 107.110](#) for Category 1 operations; [§ 107.115](#) for Category 2 operations; [§ 107.125](#) for Category 3 operations; or [§ 107.140](#) for Category 4 operations.

(b) For an operation under Category 1, Category 2, or Category 3, the small unmanned aircraft, throughout the operation—

(1) Must remain within or over a closed- or restricted-access site, and all human beings located 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

(2) Must not maintain sustained flight over moving vehicles.

(c) For a Category 4 operation, the small unmanned aircraft must—

(1) Have an airworthiness certificate issued under [part 21 of this chapter](#).

(2) Be operated in accordance with the operating limitations specified in the approved Flight Manual or as otherwise specified by the Administrator. The operating limitations must not prohibit operations over human beings located inside moving vehicles.

§ 107.150 Variable mode and variable configuration of small unmanned aircraft systems.

A small unmanned aircraft system may be eligible for one or more categories of operation over human beings under this subpart, as long as a remote pilot in command cannot inadvertently switch between modes or configurations.

§ 107.155 Means of compliance.

(a) ***Establishment of compliance.*** To meet the requirements of [§ 107.120\(a\)](#) for operations in Category 2, or the requirements of [§ 107.130\(a\)](#) for operations in Category 3, the means of compliance must consist of test, analysis, or inspection.

(b) ***Required information.*** An applicant requesting FAA acceptance of a means of compliance must submit the following information to the FAA in a manner specified by the Administrator:

(1) ***Procedures.*** Detailed description of the means of compliance, including applicable test, analysis, or inspection procedures to demonstrate how the small unmanned aircraft meets the requirements of [§ 107.120\(a\)](#) for operations in Category 2 or the requirements of [§ 107.130\(a\)](#) for operations in Category 3. The description should include conditions, environments, and methods, as applicable.

(2) **Compliance explanation.** Explanation of how application of the means of compliance fulfills the requirements of [§ 107.120\(a\)](#) for operations in Category 2 or the requirements of [§ 107.130\(a\)](#) for operations in Category 3.

(c) **FAA acceptance.** If the FAA determines the applicant has demonstrated compliance with [paragraphs \(a\)](#) and [\(b\)](#) of this section, it will notify the applicant that it has accepted the means of compliance.

(d) **Rescission.**

(1) A means of compliance is subject to ongoing review by the Administrator. The Administrator may rescind its acceptance of a means of compliance if the Administrator determines that a means of compliance does not meet any or all of the requirements of this subpart.

(2) The Administrator will publish a notice of rescission in the Federal Register.

(e) **Inapplicability of part 13, subpart D, of this chapter.** Part 13, subpart D, of this chapter does not apply to the procedures of [paragraph \(a\)](#) of this section.

§ 107.160 Declaration of compliance.

(a) **Required information.** In order for an applicant to declare a small unmanned aircraft is compliant with the requirements of this subpart for Category 2 or Category 3 operations, an applicant must submit a declaration of compliance for acceptance by the FAA, in a manner specified by the Administrator, that includes the following information:

(1) Applicant's name;

(2) Applicant's physical address;

(3) Applicant's email address;

(4) The small unmanned aircraft make and model name, and series, if applicable;

(5) The small unmanned aircraft serial number or range of serial numbers that are the subject of the declaration of compliance;

(6) Whether the declaration of compliance is an initial declaration or an amended declaration;

(7) If the declaration of compliance is an amended declaration, the reason for the re-submittal;

(8) The accepted means of compliance the applicant used to fulfill requirements of [§ 107.120\(a\)](#) or [§ 107.130\(a\)](#) or both;

(9) A declaration that the applicant—

(i) Has demonstrated that the small unmanned aircraft, or specific configurations of that aircraft, satisfies [§ 107.120\(a\)](#) or [§ 107.130\(a\)](#) or both, through the accepted means of compliance identified in [paragraph \(a\)\(8\)](#) of this section;

(ii) Has verified that the unmanned aircraft does not contain any safety defects;

(iii) Has satisfied [§ 107.120\(b\)\(3\)](#) or [§ 107.130\(b\)\(3\)](#), or both; and

(iv) Will, upon request, allow the Administrator to inspect its facilities, technical data, and any manufactured small unmanned aircraft and witness any tests necessary to determine compliance with this subpart; and

(10) Other information as required by the Administrator.

(b) **FAA acceptance.** If the FAA determines the applicant has demonstrated compliance with the requirements of this subpart, it will notify the applicant that it has accepted the declaration of compliance.

(c) **Notification of a safety issue.** Prior to initiating rescission proceedings pursuant to [paragraphs \(d\)\(1\)](#) through [\(3\)](#) of this section, the FAA will notify the applicant if a safety issue has been identified for the declaration of compliance.

(d) **Rescission.**

(1) No person may operate a small unmanned aircraft identified on a declaration of compliance that the FAA has rescinded pursuant to this subpart while that declaration of compliance is rescinded.

(2) The FAA may rescind a declaration of compliance if any of the following conditions occur:

(i) A small unmanned aircraft for which a declaration of compliance was accepted no longer complies with [§ 107.120\(a\)](#) or [§ 107.130\(a\)](#);

(ii) The FAA finds a declaration of compliance is in violation of [§ 107.5\(a\)](#); or

(iii) The Administrator determines an emergency exists related to safety in accordance with the authority in [49 U.S.C. 46105](#).

(3) If a safety issue identified under [paragraph \(c\)](#) of this section has not been resolved, the FAA may rescind the declaration of compliance as follows:

(i) The FAA will issue a notice proposing to rescind the declaration of compliance. The notice will set forth the Agency's basis for the proposed rescission and provide the holder

of the declaration of compliance with 30 calendar days from the date of issuance of the proposed notice to submit evidentiary information to refute the proposed notice.

(ii) The holder of the declaration of compliance must submit information demonstrating how the small unmanned aircraft meets the requirements of this subpart within 30 calendar days from the date of issuance of the proposed notice.

(iii) If the FAA does not receive the information required by [paragraph \(d\)\(3\)\(ii\)](#) of this section within 30 calendar days from the date of the issuance of the proposed notice, the FAA will issue a notice rescinding the declaration of compliance.

(4) If the Administrator determines that an emergency exists in accordance with [paragraph \(d\)\(2\)\(iii\)](#) of this section, the FAA will exercise its authority under [49 U.S.C. 46105\(c\)](#) to issue an order rescinding a declaration of compliance without initiating the process in [paragraph \(d\)\(3\)](#) of this section.

(e) ***Petition to reconsider the rescission of a declaration of compliance.*** A person subject to an order of rescission under [paragraph \(d\)\(3\)](#) of this section may petition the FAA to reconsider the rescission of a declaration of compliance by submitting a request to the FAA in a manner specified by the Administrator within 60 days of the date of issuance of the rescission.

(1) A petition to reconsider the rescission of a declaration of compliance must demonstrate at least one of the following:

(i) A material fact that was not present in the original response to the notification of the safety issue and an explanation for why it was not present in the original response;

(ii) The FAA made a material factual error in the decision to rescind the declaration of compliance; or

(iii) The FAA did not correctly interpret a law, regulation, or precedent.

(2) Upon consideration of the information submitted under [paragraph \(e\)\(1\)](#) of this section, the FAA will issue a notice either affirming the rescission or withdrawing the rescission.

(f) ***Inapplicability of part 13, subpart D, of this chapter.*** Part 13, subpart D, of this chapter does not apply to the procedures of [paragraphs \(d\)](#) and [\(e\)](#) of this section.

§ 107.165 Record retention.

(a) A person who submits a declaration of compliance under this subpart must retain and make available to the Administrator, upon request, the information described in [paragraph \(a\)\(1\)](#) of this section for the period of time described in [paragraph \(a\)\(2\)](#) of this section.

(1) All supporting information used to demonstrate the small unmanned aircraft meets the requirements of [§§ 107.120\(a\)](#), for operations in Category 2, and 107.130(a), for operations in Category 3.

(2) The following time periods apply:

(i) If the person who submits a declaration of compliance produces a small unmanned aircraft, that person must retain the information described in [paragraph \(a\)\(1\)](#) of this section for two years after the cessation of production of the small unmanned aircraft system for which the person declared compliance.

(ii) If the person who submits a declaration of compliance designs or modifies a small unmanned aircraft, that person must retain the information described in [paragraph \(a\)\(1\)](#) of this section for two years after the person submitted the declaration of compliance.

(b) A person who submits a means of compliance under this subpart must retain and make available to the Administrator, upon request, and for as long as the means of compliance remains accepted, the detailed description of the means of compliance and justification showing how the means of compliance meets the requirements of [§§ 107.120\(a\)](#), for operations in Category 2, and 107.130(a), for operations in Category 3.

Subpart E—Waivers

§ 107.200 Waiver policy and requirements.

(a) The Administrator may issue a certificate of waiver authorizing a deviation from any regulation specified in [§ 107.205](#) if the Administrator finds that a proposed small UAS operation can safely be conducted under the terms of that certificate of waiver.

(b) A request for a certificate of waiver must contain a complete description of the proposed operation and justification that establishes that the operation can safely be conducted under the terms of a certificate of waiver.

(c) The Administrator may prescribe additional limitations that the Administrator considers necessary.

(d) A person who receives a certificate of waiver issued under this section:

(1) May deviate from the regulations of this part to the extent specified in the certificate of waiver; and

(2) Must comply with any conditions or limitations that are specified in the certificate of waiver.

§ 107.205 List of regulations subject to waiver.

A certificate of waiver issued pursuant to [§ 107.200](#) may authorize a deviation from the following regulations of this part:

- (a) Section 107.25—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.
- (b) Section 107.29(a)(2) and (b)—Anti-collision light required for operations at night and during periods of civil twilight.
- (c) Section 107.31—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.
- (d) Section 107.33—Visual observer.
- (e) Section 107.35—Operation of multiple small unmanned aircraft systems.
- (f) Section 107.37(a)—Yielding the right of way.
- (g) Section 107.39—Operation over people.
- (h) Section 107.41—Operation in certain airspace.
- (i) Section 107.51—Operating limitations for small unmanned aircraft.
- (j) Section 107.145—Operations over moving vehicles.

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Amdt. No. 107–8, [86 FR 4387](#), Jan. 15, 2021]

Texas Regulations for sUAS

Objective	To help the student understand the operating requirements and limitations that exist in the state of Texas		
Pre-requisites	<ul style="list-style-type: none"> • Federal Aviation Regulations 		
Approx. Time	Ground:	2.0	Flight: N/A
Materials	□ N/A		
Ground work	<p style="text-align: center;">GOVERNMENT CODE</p> <p style="text-align: center;">TITLE 4. EXECUTIVE BRANCH</p> <p style="text-align: center;">SUBTITLE B. LAW ENFORCEMENT AND PUBLIC PROTECTION</p> <p style="text-align: center;">CHAPTER 423. USE OF UNMANNED AIRCRAFT</p> <p style="text-align: center;">Sec. 423.001. DEFINITION. In this chapter, "image" means any capturing of sound waves, thermal, infrared, ultraviolet, visible light, or other electromagnetic waves, odor, or other conditions existing on or about real property in this state or an individual located on that property.</p> <p style="text-align: center;">Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. 912), Sec. 2, eff. September 1, 2013.</p> <p style="text-align: center;">Sec. 423.002. NONAPPLICABILITY.</p> <p>a) It is lawful to capture an image using an unmanned aircraft in this state:</p> <ol style="list-style-type: none"> 1) for the purpose of professional or scholarly research and development or for another academic purpose by a person acting on behalf of an institution of higher education or a private or independent institution of higher education, as those terms are defined by Section 61.003, Education Code, including a person who: <ol style="list-style-type: none"> A) is a professor, employee, or student of the institution; or B) is under contract with or otherwise acting under the direction or on behalf of the institution; 2) in airspace designated as a test site or range authorized by the Federal Aviation Administration for the purpose of integrating unmanned aircraft systems into the national airspace; 3) as part of an operation, exercise, or mission of any branch of the United States military; 4) if the image is captured by a satellite for the purposes of mapping; 5) if the image is captured by or for an electric or natural gas utility or a telecommunications provider: <ol style="list-style-type: none"> A) for operations and maintenance of utility or telecommunications facilities for the 		

- purpose of maintaining utility or telecommunications system reliability and integrity;
- B) for inspecting utility or telecommunications facilities to determine repair, maintenance, or replacement needs during and after construction of such facilities;
- C) for assessing vegetation growth for the purpose of maintaining clearances on utility or telecommunications easements; and
- D) for utility or telecommunications facility routing and siting for the purpose of providing utility or telecommunications service;
- 6) with the consent of the individual who owns or lawfully occupies the real property captured in the image;
- 7) pursuant to a valid search or arrest warrant;
- 8) if the image is captured by a law enforcement authority or a person who is under contract with or otherwise acting under the direction or on behalf of a law enforcement authority:
 - A) in immediate pursuit of a person law enforcement officers have reasonable suspicion or probable cause to suspect has committed an offense, not including misdemeanors or offenses punishable by a fine only;
 - B) for the purpose of documenting a crime scene where an offense, not including misdemeanors or offenses punishable by a fine only, has been committed;
 - C) for the purpose of investigating the scene of:
 - (i) a human fatality;
 - (ii) a motor vehicle accident causing death or serious bodily injury to a person; or
 - (iii) any motor vehicle accident on a state highway or federal interstate or highway;
 - D) in connection with the search for a missing person;
 - E) for the purpose of conducting a high-risk tactical operation that poses a threat to human life;
 - F) of private property that is generally open to the public where the property owner consents to law enforcement public safety responsibilities; or
 - G) of real property or a person on real property that is within 25 miles of the United States border for the sole purpose of ensuring border security;
- 9) if the image is captured by state or local law enforcement authorities, or a person who is under contract with or otherwise acting under the direction or on behalf of state authorities, for the purpose of:
 - A) surveying the scene of a catastrophe or other damage to determine whether a state of emergency should be declared;
 - B) preserving public safety, protecting property, or surveying damage or

contamination during a lawfully declared state of emergency; or

C) conducting routine air quality sampling and monitoring, as provided by state or local law;

10) at the scene of a spill, or a suspected spill, of hazardous materials;

11) for the purpose of fire suppression;

12) for the purpose of rescuing a person whose life or well-being is in imminent danger;

13) if the image is captured by a Texas licensed real estate broker in connection with the marketing, sale, or financing of real property, provided that no individual is identifiable in the image;

14) from a height no more than eight feet above ground level in a public place, if the image was captured without using any electronic, mechanical, or other means to amplify the image beyond normal human perception;

15) of public real property or a person on that property;

16) if the image is captured by the owner or operator of an oil, gas, water, or other pipeline for the purpose of inspecting, maintaining, or repairing pipelines or other related facilities, and is captured without the intent to conduct surveillance on an individual or real property located in this state;

17) in connection with oil pipeline safety and rig protection;

18) in connection with port authority surveillance and security;

19) if the image is captured by a registered professional land surveyor in connection with the practice of professional surveying, as those terms are defined by Section [1071.002](#), Occupations Code, provided that no individual is identifiable in the image;

20) if the image is captured by a professional engineer licensed under Subchapter G, Chapter [1001](#), Occupations Code, in connection with the practice of engineering, as defined by Section [1001.003](#), Occupations Code, provided that no individual is identifiable in the image; or

21) if:

A) the image is captured by an employee of an insurance company or of an affiliate of the company in connection with the underwriting of an insurance policy, or the rating or adjusting of an insurance claim, regarding real property or a structure on real property; and

B) the operator of the unmanned aircraft is authorized by the Federal Aviation Administration to conduct operations within the airspace from which the image is captured.

b) This chapter does not apply to the manufacture, assembly, distribution, or sale of an unmanned aircraft.

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

Amended by:

Acts 2015, 84th Leg., R.S., Ch. 360 (H.B. [2167](#)), Sec. 1, eff. September 1, 2015.

Acts 2017, 85th Leg., R.S., Ch. 583 (S.B. [840](#)), Sec. 1, eff. September 1, 2017.

Sec. 423.003. OFFENSE: ILLEGAL USE OF UNMANNED AIRCRAFT TO CAPTURE IMAGE.

- a) A person commits an offense if the person uses an unmanned aircraft to capture an image of an individual or privately owned real property in this state with the intent to conduct surveillance on the individual or property captured in the image.
- b) An offense under this section is a Class C misdemeanor.
- c) It is a defense to prosecution under this section that the person destroyed the image:
 - 1) as soon as the person had knowledge that the image was captured in violation of this section; and
 - 2) without disclosing, displaying, or distributing the image to a third party.
- d) In this section, "intent" has the meaning assigned by Section [6.03](#), Penal Code.

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

Sec. 423.004. OFFENSE: POSSESSION, DISCLOSURE, DISPLAY, DISTRIBUTION, OR USE OF IMAGE.

- a) A person commits an offense if the person:
 - 1) captures an image in violation of Section [423.003](#); and
 - 2) possesses, discloses, displays, distributes, or otherwise uses that image.
- b) An offense under this section for the possession of an image is a Class C misdemeanor. An offense under this section for the disclosure, display, distribution, or other use of an image is a Class B misdemeanor.
- c) Each image a person possesses, discloses, displays, distributes, or otherwise uses in violation of this section is a separate offense.
- d) It is a defense to prosecution under this section for the possession of an image that the person destroyed the image as soon as the person had knowledge that the image was captured in violation of Section [423.003](#).
- e) It is a defense to prosecution under this section for the disclosure, display, distribution, or other use of an image that the person stopped disclosing, displaying, distributing, or otherwise using the image as soon as the person had knowledge that the image was captured in violation of Section [423.003](#).

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

Sec. 423.0045. OFFENSE: OPERATION OF UNMANNED AIRCRAFT OVER
CORRECTIONAL FACILITY, DETENTION FACILITY, OR CRITICAL INFRASTRUCTURE FACILITY. (a)

In this section:

Text of subdivision as amended by Acts 2017, 85th Leg., R.S., Ch. 824 (H.B. [1643](#)), Sec. 1

a) Part 1

1) "Critical infrastructure facility" means:

A) one of the following, if completely enclosed by a fence or other physical barrier that is obviously designed to exclude intruders, or if clearly marked with a sign or signs that are posted on the property, are reasonably likely to come to the attention of intruders, and indicate that entry is forbidden:

- (a) a petroleum or alumina refinery;
- (b) an electrical power generating facility, substation, switching station, or electrical control center;
- (c) a chemical, polymer, or rubber manufacturing facility;
- (d) a water intake structure, water treatment facility, wastewater treatment plant, or pump station;
- (e) a natural gas compressor station;
- (f) a liquid natural gas terminal or storage facility;
- (g) a telecommunications central switching office or any structure used as part of a system to provide wired or wireless telecommunications services;
- (h) a port, railroad switching yard, trucking terminal, or other freight transportation facility;
- (i) a gas processing plant, including a plant used in the processing, treatment, or fractionation of natural gas;
- (j) a transmission facility used by a federally licensed radio or television station;
- (k) a steelmaking facility that uses an electric arc furnace to make steel;
- (l) a dam that is classified as a high hazard by the Texas Commission on Environmental Quality; or
- (m) a concentrated animal feeding operation, as defined by Section [26.048](#), Water Code; or

B) if enclosed by a fence or other physical barrier obviously designed to exclude intruders:

- (a) any portion of an aboveground oil, gas, or chemical pipeline;
- (b) an oil or gas drilling site;

- (c) a group of tanks used to store crude oil, such as a tank battery;
- (d) an oil, gas, or chemical production facility;
- (e) an oil or gas wellhead; or
- (f) any oil and gas facility that has an active flare.

Text of subdivision as amended by Acts 2017, 85th Leg., R.S., Ch. 1010 (H.B. [1424](#)), Sec. 2

a) Definitions

1) "Correctional facility" means:

- A) a confinement facility operated by or under contract with any division of the Texas Department of Criminal Justice;
- B) a municipal or county jail;
- C) a confinement facility operated by or under contract with the Federal Bureau of Prisons; or
- D) a secure correctional facility or secure detention facility, as defined by Section [51.02](#), Family Code.

2) "Critical infrastructure facility" means:

- A) one of the following, if completely enclosed by a fence or other physical barrier that is obviously designed to exclude intruders, or if clearly marked with a sign or signs that are posted on the property, are reasonably likely to come to the attention of intruders, and indicate that entry is forbidden:
 - 1. a petroleum or alumina refinery;
 - (b) an electrical power generating facility, substation, switching station, or electrical control center;
 - (c) a chemical, polymer, or rubber manufacturing facility;
 - (d) a water intake structure, water treatment facility, wastewater treatment plant, or pump station;
 - (e) a natural gas compressor station;
 - (f) a liquid natural gas terminal or storage facility;
 - (g) a telecommunications central switching office;
 - (h) a port, railroad switching yard, trucking terminal, or other freight transportation facility;
 - (i) a gas processing plant, including a plant used in the processing, treatment, or fractionation of natural gas;
 - (j) a transmission facility used by a federally licensed radio or television station;
 - (k) a steelmaking facility that uses an electric arc furnace to make steel; or
 - (l) a dam that is classified as a high hazard by the Texas Commission on

Environmental Quality; or

B) any portion of an aboveground oil, gas, or chemical pipeline that is enclosed by a fence or other physical barrier that is obviously designed to exclude intruders.

3) "Dam" means any barrier, including any appurtenant structures, that is constructed for the purpose of permanently or temporarily impounding water.

4) "Detention facility" means a facility operated by or under contract with United States Immigration and Customs Enforcement for the purpose of detaining aliens and placing them in removal proceedings.

b) A person commits an offense if the person intentionally or knowingly:

1) operates an unmanned aircraft over a correctional facility, detention facility, or critical infrastructure facility and the unmanned aircraft is not higher than 400 feet above ground level;

2) allows an unmanned aircraft to make contact with a correctional facility, detention facility, or critical infrastructure facility, including any person or object on the premises of or within the facility; or

3) allows an unmanned aircraft to come within a distance of a correctional facility, detention facility, or critical infrastructure facility that is close enough to interfere with the operations of or cause a disturbance to the facility.

Text of subsection as amended by Acts 2017, 85th Leg., R.S., Ch. 824 (H.B. [1643](#)), Sec. 2

c) This section does not apply to conduct described by Subsection (b) that is committed by:

1) the federal government, the state, or a governmental entity;

2) a person under contract with or otherwise acting under the direction or on behalf of the federal government, the state, or a governmental entity;

3) a law enforcement agency;

4) a person under contract with or otherwise acting under the direction or on behalf of a law enforcement agency;

5) an owner or operator of the critical infrastructure facility;

6) a person under contract with or otherwise acting under the direction or on behalf of an owner or operator of the critical infrastructure facility;

7) a person who has the prior written consent of the owner or operator of the critical infrastructure facility;

8) the owner or occupant of the property on which the critical infrastructure facility is located or a person who has the prior written consent of the owner or occupant of that property; or

9) an operator of an unmanned aircraft that is being used for a commercial purpose, if

the operation is conducted in compliance with:

- A) each applicable Federal Aviation Administration rule, restriction, or exemption;
and
- B) all required Federal Aviation Administration authorizations.

Text of subsection as amended by Acts 2017, 85th Leg., R.S., Ch. 1010 (H.B. [1424](#)), Sec. 3

c) This section does not apply to:

1) conduct described by Subsection (b) that involves a correctional facility, detention facility, or critical infrastructure facility and is committed by:

- A) the federal government, the state, or a governmental entity;
- B) a person under contract with or otherwise acting under the direction or on behalf of the federal government, the state, or a governmental entity;
- C) a law enforcement agency;
- D) a person under contract with or otherwise acting under the direction or on behalf of a law enforcement agency; or
- E) an operator of an unmanned aircraft that is being used for a commercial purpose, if the operation is conducted in compliance with:
 - i. each applicable Federal Aviation Administration rule, restriction, or exemption; and
 - ii. all required Federal Aviation Administration authorizations; or

2) conduct described by Subsection (b) that involves a critical infrastructure facility and is committed by:

- A) an owner or operator of the critical infrastructure facility;
- B) a person under contract with or otherwise acting under the direction or on behalf of an owner or operator of the critical infrastructure facility;
- C) a person who has the prior written consent of the owner or operator of the critical infrastructure facility; or
- D) the owner or occupant of the property on which the critical infrastructure facility is located or a person who has the prior written consent of the owner or occupant of that property.

d) An offense under this section is a Class B misdemeanor, except that the offense is a Class A misdemeanor if the actor has previously been convicted under this section or Section [423.0046](#).

Added by Acts 2015, 84th Leg., R.S., Ch. 1033 (H.B. [1481](#)), Sec. 1, eff. September 1, 2015.

Amended by:

Acts 2017, 85th Leg., R.S., Ch. 824 (H.B. [1643](#)), Sec. 1, eff. September 1, 2017.
Acts 2017, 85th Leg., R.S., Ch. 824 (H.B. [1643](#)), Sec. 2, eff. September 1, 2017.
Acts 2017, 85th Leg., R.S., Ch. 1010 (H.B. [1424](#)), Sec. 1, eff. September 1, 2017.
Acts 2017, 85th Leg., R.S., Ch. 1010 (H.B. [1424](#)), Sec. 2, eff. September 1, 2017.
Acts 2017, 85th Leg., R.S., Ch. 1010 (H.B. [1424](#)), Sec. 3, eff. September 1, 2017.

Sec. 423.0046. OFFENSE: OPERATION OF UNMANNED AIRCRAFT OVER SPORTS VENUE.

- a) In this section, "sports venue" means an arena, automobile racetrack, coliseum, stadium, or other type of area or facility that:
- 1) has a seating capacity of 30,000 or more people; and
 - 2) is primarily used for one or more professional or amateur sports or athletics events.
- b) A person commits an offense if the person intentionally or knowingly operates an unmanned aircraft over a sports venue and the unmanned aircraft is not higher than 400 feet above ground level.
- c) This section does not apply to conduct described by Subsection (b) that is committed by:
- 1) the federal government, the state, or a governmental entity;
 - 2) a person under contract with or otherwise acting under the direction or on behalf of the federal government, the state, or a governmental entity;
 - 3) a law enforcement agency;
 - 4) a person under contract with or otherwise acting under the direction or on behalf of a law enforcement agency;
 - 5) an operator of an unmanned aircraft that is being used for a commercial purpose, if the operation is conducted in compliance with:
 - A) each applicable Federal Aviation Administration rule, restriction, or exemption; and
 - B) all required Federal Aviation Administration authorizations;
 - 6) an owner or operator of the sports venue;
 - 7) a person under contract with or otherwise acting under the direction or on behalf of an owner or operator of the sports venue; or
 - 8) a person who has the prior written consent of the owner or operator of the sports venue.
- d) An offense under this section is a Class B misdemeanor, except that the offense is a Class A misdemeanor if the actor has previously been convicted under this section or Section [423.0045](#).

Added by Acts 2017, 85th Leg., R.S., Ch. 1010 (H.B. [1424](#)), Sec. 4, eff. September 1, 2017.

Sec. 423.005. ILLEGALLY OR INCIDENTALLY CAPTURED IMAGES NOT SUBJECT TO DISCLOSURE.

- a) Except as otherwise provided by Subsection (b), an image captured in violation of Section [423.003](#), or an image captured by an unmanned aircraft that was incidental to the lawful capturing of an image:
 - 1) may not be used as evidence in any criminal or juvenile proceeding, civil action, or administrative proceeding;
 - 2) is not subject to disclosure, inspection, or copying under Chapter [552](#); and
 - 3) is not subject to discovery, subpoena, or other means of legal compulsion for its release.
- b) An image described by Subsection (a) may be disclosed and used as evidence to prove a violation of this chapter and is subject to discovery, subpoena, or other means of legal compulsion for that purpose.

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

Sec. 423.006. CIVIL ACTION.

- a) An owner or tenant of privately owned real property located in this state may bring against a person who, in violation of Section [423.003](#), captured an image of the property or the owner or tenant while on the property an action to:
 - 1) enjoin a violation or imminent violation of Section [423.003](#) or [423.004](#);
 - 2) recover a civil penalty of:
 - A) \$5,000 for all images captured in a single episode in violation of Section [423.003](#);
or
 - B) \$10,000 for disclosure, display, distribution, or other use of any images captured in a single episode in violation of Section [423.004](#); or
 - 3) recover actual damages if the person who captured the image in violation of Section [423.003](#) discloses, displays, or distributes the image with malice.
- b) For purposes of recovering the civil penalty or actual damages under Subsection (a), all owners of a parcel of real property are considered to be a single owner and all tenants of a parcel of real property are considered to be a single tenant.
- c) In this section, "malice" has the meaning assigned by Section [41.001](#), Civil Practice and Remedies Code.
- d) In addition to any civil penalties authorized under this section, the court shall award court costs and reasonable attorney's fees to the prevailing party.
- e) Venue for an action under this section is governed by Chapter [15](#), Civil Practice and Remedies Code.

- f) An action brought under this section must be commenced within two years from the date the image was:
- 1) captured in violation of Section [423.003](#); or
 - 2) initially disclosed, displayed, distributed, or otherwise used in violation of Section [423.004](#).

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

Sec. 423.007. RULES FOR USE BY LAW ENFORCEMENT. The Department of Public Safety shall adopt rules and guidelines for use of an unmanned aircraft by a law enforcement authority in this state.

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

Sec. 423.008. REPORTING BY LAW ENFORCEMENT AGENCY.

- a) Not earlier than January 1 and not later than January 15 of each odd-numbered year, each state law enforcement agency and each county or municipal law enforcement agency located in a county or municipality, as applicable, with a population greater than 150,000, that used or operated an unmanned aircraft during the preceding 24 months shall issue a written report to the governor, the lieutenant governor, and each member of the legislature and shall:
- 1) retain the report for public viewing; and
 - 2) post the report on the law enforcement agency's publicly accessible website, if one exists.
- b) The report must include:
- 1) the number of times an unmanned aircraft was used, organized by date, time, location, and the types of incidents and types of justification for the use;
 - 2) the number of criminal investigations aided by the use of an unmanned aircraft and a description of how the unmanned aircraft aided each investigation;
 - 3) the number of times an unmanned aircraft was used for a law enforcement operation other than a criminal investigation, the dates and locations of those operations, and a description of how the unmanned aircraft aided each operation;
 - 4) the type of information collected on an individual, residence, property, or area that was not the subject of a law enforcement operation and the frequency of the collection of this information; and
 - 5) the total cost of acquiring, maintaining, repairing, and operating or otherwise using each unmanned aircraft for the preceding 24 months.

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

Sec. 423.009. REGULATION OF UNMANNED AIRCRAFT BY POLITICAL SUBDIVISION.

a) In this section:

1) "Political subdivision" includes a county, a joint board created under Section [22.074](#), Transportation Code, and a municipality.

2) "Special event" means a festival, celebration, or other gathering that:

A) involves:

(i) the reservation and temporary use of all or a portion of a public park, road, or other property of a political subdivision; and

(ii) entertainment, the sale of merchandise, food, or beverages, or mass participation in a sports event; and

B) requires a significant use or coordination of a political subdivision's services.

b) Except as provided by Subsection (c), a political subdivision may not adopt or enforce any ordinance, order, or other similar measure regarding the operation of an unmanned aircraft.

c) A political subdivision may adopt and enforce an ordinance, order, or other similar measure regarding:

1) the use of an unmanned aircraft during a special event;

2) the political subdivision's use of an unmanned aircraft; or

3) the use of an unmanned aircraft near a facility or infrastructure owned by the political subdivision, if the political subdivision:

A) applies for and receives authorization from the Federal Aviation Administration to adopt the regulation; and

B) after providing reasonable notice, holds a public hearing on the political subdivision's intent to apply for the authorization.

d) An ordinance, order, or other similar measure that violates Subsection (b) is void and unenforceable.

Added by Acts 2017, 85th Leg., R.S., Ch. 824 (H.B. [1643](#)), Sec. 3, eff. September 1, 2017.

Tasks

- Review aeronautical knowledge

Notes

- N/A

Completion

The lesson is considered complete when the student passes the stage 1 written exam (E01 I.R.) or the FAA Private Pilot Airplane Knowledge Exam with a minimum passing grade of 70%

Airports, operational safety, and decision making

Objective	Introduce the student to decision making procedures in the aviation environment.		
Pre-requisites	<ul style="list-style-type: none"> • N/A 		
Approx. Time	Ground:	2.0	Flight: N/A
Materials	<ul style="list-style-type: none"> <input type="checkbox"/> Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25B (PHAK) <input type="checkbox"/> Video: Runway Incursion at Francis Green 		
Ground work	<ul style="list-style-type: none"> <input type="checkbox"/> Federal Aviation Regulation 91.3 – The pilot in command is the ultimate authority and the sole responsibility for the safe outcome of the flight. In the event of an emergency the pilot in command may deviate from any rule in this part to the extent necessary to ensure the safe outcome of the flight. <input type="checkbox"/> Airport operationsPHAK 14-1 <ul style="list-style-type: none"> ○ Airport typesPHAK 14-2 <ul style="list-style-type: none"> ▪ Towered ▪ Un-towered ○ Sources for airport informationPHAK 14-3 <ul style="list-style-type: none"> ▪ Aeronautical charts ▪ Chart supplement U.S. (AFD) ▪ Notices to airmen (NOTAMs) ▪ Automated terminal information systems ○ Runway markings and signs PHAK 14-5 thru 14-11 <ul style="list-style-type: none"> ▪ Runway designation markings ▪ Runway safety area ▪ Runway holding position sign ▪ Runway holding position marking ▪ Runway distance remaining signs ▪ Relocated runway threshold ▪ Displaced threshold ▪ Land and hold short operations (LAHSO) ○ Taxiway markings and signsPHAK 14-11 thru 14-16 <ul style="list-style-type: none"> ▪ Direction signs (A yellow arrow points the way) ▪ Location signs (A black square you're there) ▪ Holding position signs and markings ▪ Non-movement line ▪ Enhanced taxiway centerline ▪ ILS critical areas ▪ Closed runways and taxiways (temporarily/permanently) ○ Airport lightingPHAK 14-16 <ul style="list-style-type: none"> ▪ Airport beacon ▪ Taxiway lights ▪ Runway lights ▪ Visual glideslope indicators ▪ Obstruction lights ▪ Runway guard lights ▪ Stop bar lights ▪ Runway end identifier lights (REIL) ○ Control of airport lightingPHAK 14-18 		

- Wind direction indicatorsPHAK 14-20
- Wake turbulencePHAK 14-26
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 - Pilot deviations (PDs)
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- Aeronautical Decision Making.....PHAK 2-1
 - IntroductionPHAK 2-1
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 - Risk managementPHAK 2-3
 - Crew resource management and Single pilot resource management ..PHAK 2-4
 - Hazard and riskPHAK 2-4
 - Hazardous attitudes and antidotesPHAK 2-5
 - RiskPHAK 2-6
 - Assessing risk
 - Likelihood of an event
 - Probable – an event will occur several times
 - Occasional – an event will probably occur some time
 - Remote – an event is unlikely to occur but is possible
 - Improbable – an event is highly unlikely to occur
 - Severity of an event
 - Catastrophic – results in fatalities, total loss
 - Critical – severe injury, major damage
 - Marginal – minor injury, minor damage
 - Negligible – less than minor injury or damage
 - Mitigating risk
 - Wait for the weather to improve
 - Take an instrument rated pilot
 - Delay or cancel the flight
 - Drive
 - The PAVE checklistPHAK 2-8
 - P = pilot
 - A = aircraft
 - V = environment
 - E = external pressures
 - The Big APE
 - A = Aircraft
 - P = Pilot, including external pressures
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 - Human factorsPHAK 2-10
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 - Decision making processesPHAK 2-12
 - Single pilot resource managementPHAK 2-13
 - The 5 P’sPHAK 2-14

	<ul style="list-style-type: none"> ○ Plan ○ Plane ○ Pilot ○ Passengers ○ Programming • 3P ModelPHAK 2-15 • CARE ChecklistPHAK 2-16 • DECIDE ModelPHAK 2-18 ▪ Decision making in a dynamic environmentPHAK 2-21 <ul style="list-style-type: none"> • Automatic decision makingPHAK 2-21 • Operational pitfallsPHAK 2-21 ▪ Stress managementPHAK 2-21 ▪ Use of resourcesPHAK 2-21 ▪ Situational awarenessPHAK 2-24 <ul style="list-style-type: none"> • Obstacles to maintaining situational awareness • Workload management • Managing risks ▪ AutomationPHAK 2-25 <ul style="list-style-type: none"> • Results of the studyPHAK 2-27 • Equipment usePHAK 2-27 <ul style="list-style-type: none"> ○ Autopilot systems ○ Familiarity ○ Respect for onboard systems ○ Getting beyond rote workmanship ○ Understanding the platform • Managing aircraft automationPHAK 2-29 • Enhanced situational awarenessPHAK 2-30 • Risk managementPHAK 2-31
Tasks	<ul style="list-style-type: none"> <input type="checkbox"/> Review the aeronautical knowledge <input type="checkbox"/> Watch and discuss Video: Runway incursion at Francis Green
Notes	<ul style="list-style-type: none"> • Student should be able to differentiate between the areas of an airport (apron/ramp, taxiways, and runways) and be able to find their assigned radio frequencies. • Student should understand that there many decision making process models, and he/she needs to incorporate the one that is most useful for their type of flying. • Student should understand that LAHSO operations are NOT permitted for students nor are they mandatory for certificated pilots. • Emphasis should be put on using either the PAVE or the APE model prior to each flight <ul style="list-style-type: none"> ○ PAVE <ul style="list-style-type: none"> ▪ P = pilot <ul style="list-style-type: none"> • IM SAFE • Hazardous attitudes ▪ A = aircraft <ul style="list-style-type: none"> • Can the aircraft perform the mission? • Can I proficiently operate the aircraft and all of its onboard equipment? • Is the aircraft legal and airworthy? ▪ V = enVironment

	<ul style="list-style-type: none"> • Is the weather along and around the route of flight safe? And will it remain safe for my return trip? • What am I flying over? Am I prepared to survive in the case of an unscheduled landing? ▪ E = external pressures <ul style="list-style-type: none"> • Why am I going? • Am I prepared to spend the night in case of delays? • Get 'er duns, Get-home-itis, etc. • Did I bring grandma's medications? ○ APE (Avoid the big APE) <ul style="list-style-type: none"> ▪ A = aircraft <ul style="list-style-type: none"> • Can the aircraft perform the mission? • Can I proficiently operate the aircraft and all of its onboard equipment? • Is the aircraft legal and airworthy? ▪ P = pilot <ul style="list-style-type: none"> • IM SAFE • Hazardous attitudes • External pressures <ul style="list-style-type: none"> ○ Why am I going? ○ Am I prepared to spend the night in case of delays? ○ Get 'er duns, Get-home-itis, etc. ○ Did I bring grandma's medications? ▪ E = environment <ul style="list-style-type: none"> • Is the weather along and around the route of flight safe? And will it remain safe for my return trip? • What am I flying over? Am I prepared to survive in the case of an unscheduled landing?
Completion	The lesson is considered complete when the student passes the stage 1 written exam (E01 I.R.) or the FAA Private Pilot Airplane Knowledge Exam with a minimum passing grade of 70%

Aerodynamics, stability, and turning tendencies

Objective	To help the student understand the forces that act upon an aircraft in-flight so that he/she may better control them.		
Pre-requisites	<ul style="list-style-type: none"> • None 		
Approx. Time	Ground:	4.0	Flight: N/A
Materials	<input type="checkbox"/> Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25B (PHAK) <input type="checkbox"/> Model aircraft		
Ground work	<input type="checkbox"/> The four forces acting on an aircraft PHAK 5-1 <ul style="list-style-type: none"> ○ Weight PHAK 5-1 ○ Lift..... PHAK 5-3 <ul style="list-style-type: none"> ▪ Theories in the production of lift PHAK 4-5 <ul style="list-style-type: none"> • Newton's law (creating lift thru angle of attack) • Bernoulli's law (creating lift thru camber) ▪ Airfoil design PHAK 4-6 <ul style="list-style-type: none"> • Airfoil cross section PHAK 4-7 fig. 4-5 <ul style="list-style-type: none"> ○ Chord line ○ Camber ○ Leading edge ○ Trailing edge • Pressure distribution..... PHAK 4-7 <ul style="list-style-type: none"> ○ Low pressure above (Bernoulli's law) ○ High pressure below (Newton's law) ○ Thrust PHAK 5-2 ○ Drag PHAK 5-6 <ul style="list-style-type: none"> ▪ Parasite drag ▪ Induced drag ▪ Lift/drag ratio (L/D_{Max}) <input type="checkbox"/> Wingtip Vortices PHAK 5-8 <ul style="list-style-type: none"> ○ Formation ○ Avoiding wake turbulence <input type="checkbox"/> Ground effect..... PHAK 5-11 <input type="checkbox"/> Axes of an aircraft..... PHAK 5-12 <ul style="list-style-type: none"> ○ Roll about the longitudinal ○ Pitch about the lateral ○ Yaw about the vertical <input type="checkbox"/> Aircraft design characteristics PHAK 5-14 <ul style="list-style-type: none"> ○ Stability..... PHAK 5-14 <ul style="list-style-type: none"> ▪ Static vs. Dynamic ▪ Longitudinal ▪ Lateral <ul style="list-style-type: none"> • Dihedral • Sweepback and wing location • Keel effect and weight distribution ▪ Directional <ul style="list-style-type: none"> ▪ Free directional oscillations (Dutch roll) ▪ Spiral 		

- Effect of wing planform PHAK 5-20
 - Aspect ratio
 - Wing designs
- Aerodynamic forces in flight maneuvers PHAK 5-22
 - Forces in turns PHAK 5-22
 - Components of lift
 - Adverse yaw
 - Overbanking tendency
 - Forces in climbs PHAK 5-23
 - Climb entry
 - Thrust vs. drag in a climb
 - Forces in descents PHAK 5-24
- Stalls and spins..... PHAK 5-25
- Angle of attack indicators PHAK 5-26
- Basic propeller principles (Left hand turning tendencies) PHAK 5-28
 - Torque
 - Corkscrew effect (spiraling slipstream)
 - Gyroscopic action
 - Asymmetric loading (P-factor)
- Load factors PHAK 5-33
 - In aircraft design
 - In steep turns
 - Effect on stalling speed
 - Flight maneuvers
 - Rough air and maneuvering speed (V_A)
 - V_g diagram
 - Rate of turn
- Flight controls PHAK 6-1
 - Flight control systems..... PHAK 6-2
 - Primary flight controls
 - Ailerons PHAK 6-3
 - Purpose
 - Adverse yaw
 - Differential ailerons
 - Frise type ailerons
 - Coupled ailerons and rudder
 - Flaperons
 - Elevator PHAK 6-5
 - Purpose
 - T-tail
 - Stabilator
 - Canard
 - Rudder PHAK 6-8
 - Purpose
 - V-tail (rudder-vator)
 - Secondary flight controls
 - Flaps and types of flaps..... PHAK 6-8, PHAK 3-6
 - Leading edge devices (slots) PHAK 6-9

	<ul style="list-style-type: none"> • Spoilers..... PHAK 6-10 • Trim systems PHAK 6-10 <ul style="list-style-type: none"> ○ Trim tabs ○ Balance tabs ○ Servo tabs ○ Anti-servo tabs ○ Ground adjustable tabs ○ Autopilots
Tasks	<input type="checkbox"/> Review aeronautical knowledge
Notes	<ul style="list-style-type: none"> • N/A
Completion	The lesson is considered complete when the student passes the stage 1 written exam (E01 I.R.) or the FAA Private Pilot Airplane Knowledge Exam with a minimum passing grade of 70%

Performance/Weight and balance

Objective	Ensure the student understands the factors that affect aircraft's ability to perform.		
Pre-requisites	<ul style="list-style-type: none"> • N/A 		
Approx. Time	Ground:	2.0	Flight: N/A
Materials	<input type="checkbox"/> Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B) (PHAK)		
Ground work	<input type="checkbox"/> Importance of performance data PHAK 11-1 <input type="checkbox"/> Structure of the atmosphere PHAK 11-2 <input type="checkbox"/> Atmospheric pressure PHAK 11-2 <input type="checkbox"/> Pressure altitude PHAK 11-3 <input type="checkbox"/> Density altitude PHAK 11-3 <ul style="list-style-type: none"> ○ Effects of pressure on density ○ Effects of temperature on density ○ Effects of humidity on density <input type="checkbox"/> Performance PHAK 11-5 <ul style="list-style-type: none"> ○ Straight-and-level flight ○ Climb performance (Best angle/best rate) ○ Range performance ○ Region of reversed command ○ Takeoff and landing performance ○ Runway surface and gradient ○ Water on the runway and dynamic hydroplaning ○ Takeoff and landing performance <input type="checkbox"/> Performance speeds PHAK 11-18 <input type="checkbox"/> Performance charts PHAK 11-19 <ul style="list-style-type: none"> ○ Interpolation ○ Density altitude chart ○ Takeoff chart ○ Climb and cruise chart ○ Crosswind and headwind component chart ○ Landing chart ○ Stall speed chart <input type="checkbox"/> Transport category aircraft performance PHAK 11-28 <input type="checkbox"/> Air carrier obstacle clearance requirements PHAK 11-28 <input type="checkbox"/> Introduction PHAK 10-1 <input type="checkbox"/> Weight control PHAK 10-1 <ul style="list-style-type: none"> ○ Effects of weight PHAK 10-2 ○ Weight changes PHAK 10-2 ○ Balance, stability, and center of gravity PHAK 10-2 <ul style="list-style-type: none"> ▪ Effects of adverse balance on stability and control ○ Management of weight and balance control PHAK 10-4 ○ Terms and definitions PHAK 10-4 ○ Principles of weight and balance computations PHAK 10-5 ○ Weight and balance restrictions PHAK 10-6 <input type="checkbox"/> Determining loaded weight and CG		

	<ul style="list-style-type: none"> ○ Computational method ○ Graph method ○ Table method ○ Computations with a negative arm ○ Computations with zero fuel weight ○ Shifting, adding, and removing weight <ul style="list-style-type: none"> ▪ $W_{to_move}/W_{total} = D_{CG_moves}/D_{obj_moves}$
Tasks	<ul style="list-style-type: none"> □ Review the aeronautical knowledge
Notes	<ul style="list-style-type: none"> • Standard temperature and pressure: 15°C and 29.92inHG
Completion	The lesson is considered complete when the student passes the stage 2 written exam (E02 I.R.) or the FAA Private Pilot Airplane Knowledge Exam with a minimum passing grade of 70%

Airspace

Objective	Introduce the student to the National Airspace System and the rules that govern it so that he/she may operate within it safely.		
Pre-requisites	<ul style="list-style-type: none"> • N/A 		
Approx. Time	Ground:	2.0	Flight: N/A
Materials	<input type="checkbox"/> Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25B (PHAK)		
Ground work	<input type="checkbox"/> The purpose of controlled airspace is to allow ATC to maintain varying levels of positive control over IFR traffic. In uncontrolled airspace, ATC cannot guarantee positive control of any kind, and thus an IFR clearance cannot be obtained. <input type="checkbox"/> Six major airspaces PHAK 15-1 <ul style="list-style-type: none"> ○ Class A ○ Class B ○ Class C ○ Class D ○ Class E ○ Class G <input type="checkbox"/> Special use airspace PHAK 15-3 <ul style="list-style-type: none"> ○ Prohibited ○ Restricted ○ Military operation areas (MOAs) ○ Alert areas ○ Controlled firing areas <input type="checkbox"/> Other airspace PHAK 15-4 <ul style="list-style-type: none"> ○ Local airport advisory (LAA) ○ Military training routes (MTR) ○ Temporary flight restrictions (TFRs) ○ Published VFR routes ○ Terminal RADAR service areas (TRSAs) ○ National Security Areas (NSAs) <input type="checkbox"/> Air traffic control and the national airspace system PHAK 15-7 <ul style="list-style-type: none"> ○ Coordinating the use of the airspace system ○ Operating rules and pilot/equipment requirements ○ Operating under special VFR 		
Tasks	<input type="checkbox"/> Review the aeronautical knowledge		
Notes	<ul style="list-style-type: none"> • The easiest method by which to teach airspace is to break the six major airspaces into two categories by size: <ul style="list-style-type: none"> ○ A, E, and G are the largest, exist across the U.S., and are where the pilots will spend most of their time. They should be viewed as layers looking from the "top down", and are not depicted on the sectional. ○ E is depicted on the chart only when it extends below 1200 ft AGL. ○ D, C, and B are local airspaces surrounding controlled airports. They should be viewed as "sprouting out of the ground" and growing upwards. • Each airspace explanation should be accompanied by its basic VFR weather minimums, its depiction on a sectional, and requirements for entry and operation within. • It should be stressed that conditions with less than 1000' ceilings and 3SM visibility are 		

	considered Instrument Meteorological Conditions.
Completion	The lesson is considered complete when the student passes the stage 1 written exam (E01 I.R.) or the FAA Private Pilot Airplane Knowledge Exam with a minimum passing grade of 70%

Weather Theory

Objective	Teach the student to understand the importance of weather influences on flight safety and performance.		
Pre-requisites	<ul style="list-style-type: none"> • N/A 		
Approx. Time	Ground:	2.0	Flight: N/A
Materials	<input type="checkbox"/> Pilot's Handbook of Aeronautical Knowledge (PHAK)		
Aeronautical knowledge	<input type="checkbox"/> Introduction to Weather Theory PHAK 11-1 <input type="checkbox"/> Atmosphere PHAK 11-2 <ul style="list-style-type: none"> ○ Composition of the atmosphere ○ Atmospheric Circulation ○ Atmospheric Pressure <input type="checkbox"/> Coriolis Force PHAK 11-3 <input type="checkbox"/> Measurement of Atmospheric Pressure..... PHAK 11-4 <input type="checkbox"/> Altitude and Atmospheric Pressure PHAK 11-5 <input type="checkbox"/> Wind and Currents..... PHAK 11-7 <ul style="list-style-type: none"> ○ Wind patterns ○ Convective currents ○ Effect of obstructions on wind ○ Low level wind shear ○ Wind and pressure representation on Surface Weather maps <input type="checkbox"/> Atmospheric Stability..... PHAK 11-12 <ul style="list-style-type: none"> ○ Inversions ○ Moisture and temperature ○ Relative humidity ○ Temperature/Dew point relationship ○ Dew and frost ○ Fog <input type="checkbox"/> Clouds PHAK 11-15 <ul style="list-style-type: none"> ○ Ceiling ○ Visibility ○ Precipitation <input type="checkbox"/> Air masses PHAK 11-18 <input type="checkbox"/> Fronts..... PHAK 11-18 <ul style="list-style-type: none"> ○ Warm front ○ Cold front <ul style="list-style-type: none"> ▪ Fast moving cold front ▪ Flight toward an approaching cold front ▪ Comparison of cold and warm fronts ▪ Wind shifts ○ Stationary front ○ Occluded front ○ Thunderstorms PHAK 11-23 ○ Hazards to aircraft PHAK 11-23 <ul style="list-style-type: none"> ▪ Squall line ▪ Tornadoes ▪ Turbulence ▪ Icing 		

	<ul style="list-style-type: none"> ▪ Hail ▪ Ceiling and visibility ▪ Effect on altimeters ▪ Lightning ▪ Engine water ingestion
Tasks	<ul style="list-style-type: none"> <input type="checkbox"/> Review aeronautical knowledge
Notes	<ul style="list-style-type: none"> • None
Completion	The lesson is considered complete when the student passes the stage 2 written exam (E02 I.R.) or the FAA Private Pilot Airplane Knowledge Exam with a minimum passing grade of 70%

Weather services

Objective	To provide the student with the skills and knowledge necessary to interpret weather reports and make safe decisions regarding flight.		
Pre-requisites	<ul style="list-style-type: none"> • G09. Weather Theory 		
Approx. Time	Ground:	2.0	Flight: N/A
Materials	<input type="checkbox"/> Pilot's Handbook of Aeronautical Knowledge		
Ground work	<input type="checkbox"/> Introduction to Weather Services.....PHAK 12-1 <input type="checkbox"/> Observations.....PHAK 12-2 <ul style="list-style-type: none"> ○ Surface weather Observations ○ Upper Air Observations ○ Radar Observations ○ Satellite <input type="checkbox"/> SIGMET.....PHAK 12-4 <input type="checkbox"/> AIRMETPHAK 12-4 <input type="checkbox"/> Service Outlets.....PHAK 12-4 <ul style="list-style-type: none"> ○ Automated Flight Service Station (AFSS) ○ Transcribed Information Briefing Service (TIBS) ○ Direct User Access Terminal Service (DUATS) ○ En Route Flight Advisory Service (EFAS) ○ Hazardous Inflight Weather Advisory Service (HIWAS) ○ Transcribed Weather Broadcast (TWEB) <input type="checkbox"/> Weather BriefingsPHAK 12-5 <ul style="list-style-type: none"> ○ Standard briefing ○ Abbreviated briefing ○ Outlook briefing <input type="checkbox"/> Aviation Weather ReportsPHAK 12-6 <ul style="list-style-type: none"> ○ Aviation Routine Weather Report (METAR) ○ Pilot Weather Report (PIREPs) <input type="checkbox"/> Aviation Forecasts.....PHAK 12-10 <ul style="list-style-type: none"> ○ Terminal Aerodrome Forecasts (TAFs) ○ Area Forecasts (FA) <input type="checkbox"/> Inflight Weather AdvisoriesPHAK 12-12 <ul style="list-style-type: none"> ○ AIRMETs (WAs) ○ SIGMETs (WSs) ○ Convective Significant Meteorological Information (WST) <input type="checkbox"/> Winds and Temperature Aloft Forecast (FD)PHAK 12-14 <input type="checkbox"/> Weather Charts.....PHAK 12-15 <ul style="list-style-type: none"> ○ Surface Analysis Chart ○ Weather Depiction Chart ○ Radar Summary Chart ○ Significant Weather Prognostic Charts <input type="checkbox"/> ATC Weather Displays and Weather Avoidance AssistancePHAK 12-19 <input type="checkbox"/> Electronic Flight Displays/Multi-Function Displays.....PHAK 12-21 <ul style="list-style-type: none"> ○ Weather products age and expiration ○ Next Generation Weather RADAR System <ul style="list-style-type: none"> ▪ Level II data products 		

	<ul style="list-style-type: none"> ▪ Level III data products ○ NEXRAD abnormalities ○ NEXRAD limitations <ul style="list-style-type: none"> ▪ Base reflectivity ▪ Resolution display ○ AIRMET/SIGMET display ○ Graphical METARs
Tasks	<input type="checkbox"/> Review aeronautical knowledge
Notes	<ul style="list-style-type: none"> • Student should be made aware that in-cockpit weather relayed from the ground can be delayed by as much as 15-20 minutes.
Completion	The lesson is considered complete when the student passes the stage 2 written exam (E02 I.R.) or the FAA Private Pilot Airplane Knowledge Exam with a minimum passing grade of 70%