Unmanned Aircraft Systems
Rules & Regulations

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Current rules?

Date?

Commercial use is illegal

Line of sight

400 foot altitude

No flying near people

No flying near urban areas

No flying near airports

AC 91-57

DATE June 9, 1981

ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Washington, D.C.

Subject: MODEL AIRCRAFT OPERATING STANDARDS

1. PURPOSE. This advisory circular outlines, and encourages voluntary compliance with, safety standards for model aircraft operators.

2. BACKGROUND. Modelers, generally, are concerned about safety and do exercise good judgement when flying model aircraft. However, model aircraft can at times pose a hazard to full-scale aircraft in flight and to persons and property on the surface. Compliance with the following standards will help reduce the potential for that hazard and create a good neighbor environment with affected communities and airspace users.

3. OPERATING STANDARDS.

a. Select an operating site that is of sufficient distance from populated areas. The selected site should be away from noise sensitive areas such as parks, schools, hospitals, churches, etc.

b. Do not operate model aircraft in the presence of spectators until the aircraft is successfully flight tested and proven airworthy.

c. Do not fly model aircraft higher than 400 feet above the surface. When flying aircraft within 3 miles of an airport, notify the airport operator, or when an air traffic facility is located at the airport, notify the control tower, or flight service station.

d. Give right of way to, and avoid flying in the proximity of, full-scale aircraft. Use observers to help if possible.

e. Do not hesitate to ask for assistance from any airport traffic control tower or flight service station concerning compliance with these standards.

R. J. VAN VUREN
Director, Air Traffic Service

Initiated by: AAT-220

FAR & AIM

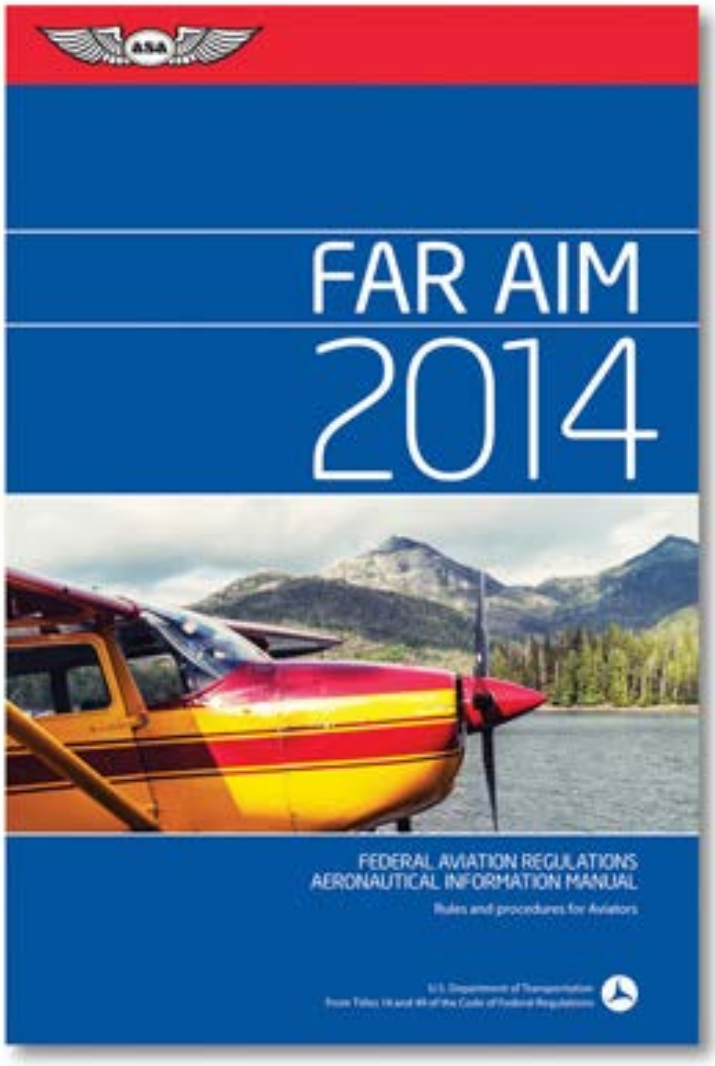
Federal Aviation Regulations (FARs)

Aeronautical Information Manual (AIM)

Avoiding midair collision is critical - pilot uses “see and avoid”

US Code of Federal Regulations:

CFR 14, Part 91.113



FAR & AIM

US Code of Federal Regulations: CFR 14, Part 91.113

“. . . vigilance shall be maintained by each person operation an aircraft so as to see and avoid other aircraft.”

and “. . . not operate an aircraft so close to another aircraft as to create a collision hazard.”

With UAS, the pilot is <u>not</u> in the air.

FAR Part 91

Rules include:

Equipment & Instruments

Certifications

Special Flight Operations

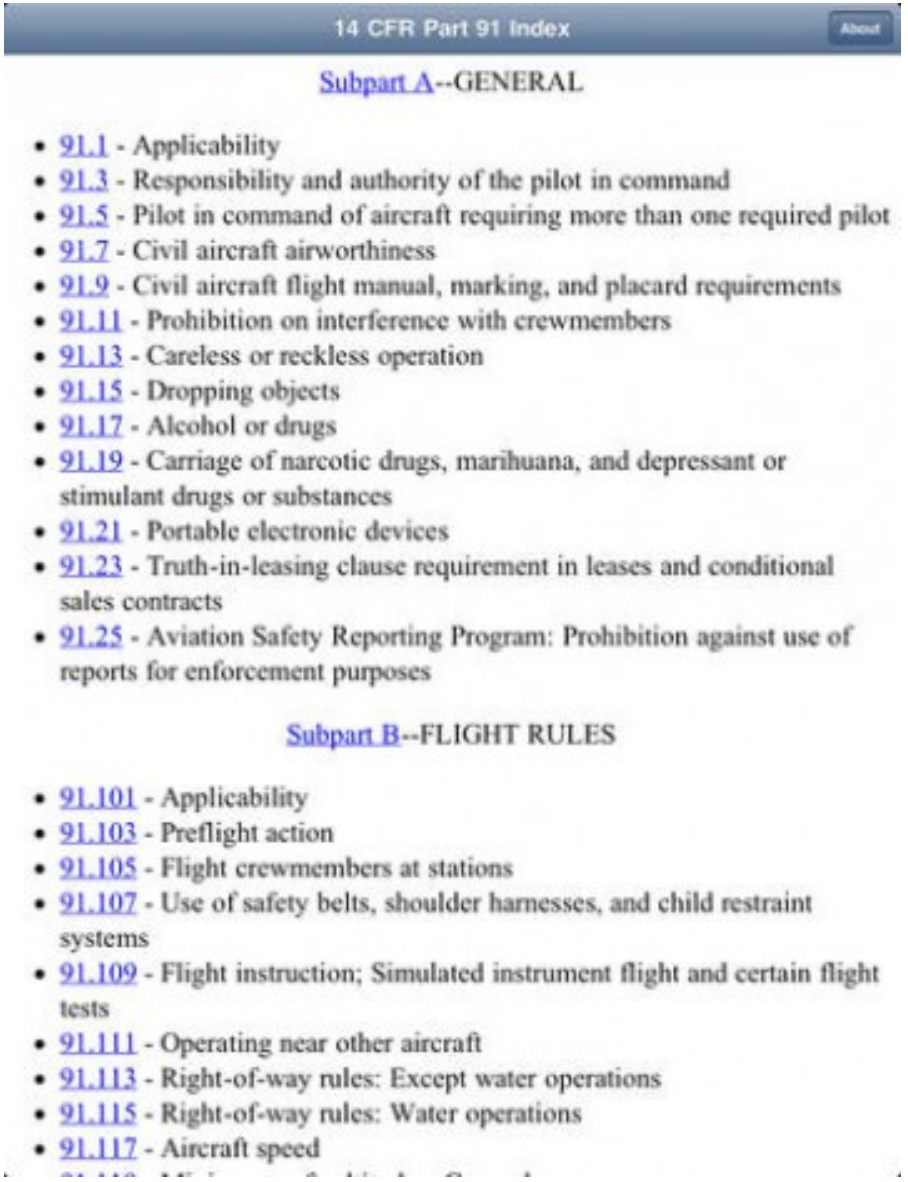
Maintenance & Alterations

Operating Noise Limits

Weather Minimums

Waivers

Etc.



14 CFR Part 91 Index

About

Subpart A--GENERAL

- 91.1 - Applicability
- 91.3 - Responsibility and authority of the pilot in command
- 91.5 - Pilot in command of aircraft requiring more than one required pilot
- 91.7 - Civil aircraft airworthiness
- 91.9 - Civil aircraft flight manual, marking, and placard requirements
- 91.11 - Prohibition on interference with crewmembers
- 91.13 - Careless or reckless operation
- 91.15 - Dropping objects
- 91.17 - Alcohol or drugs
- 91.19 - Carriage of narcotic drugs, marihuana, and depressant or stimulant drugs or substances
- 91.21 - Portable electronic devices
- 91.23 - Truth-in-leasing clause requirement in leases and conditional sales contracts
- 91.25 - Aviation Safety Reporting Program: Prohibition against use of reports for enforcement purposes

Subpart B--FLIGHT RULES

- 91.101 - Applicability
- 91.103 - Preflight action
- 91.105 - Flight crewmembers at stations
- 91.107 - Use of safety belts, shoulder harnesses, and child restraint systems
- 91.109 - Flight instruction; Simulated instrument flight and certain flight tests
- 91.111 - Operating near other aircraft
- 91.113 - Right-of-way rules: Except water operations
- 91.115 - Right-of-way rules: Water operations
- 91.117 - Aircraft speed

FAR & UAS

FAR defines an aircraft as

"a device that is used for flight in the air".

No difference between manned and unmanned

FAR 91: Governs the operation of aircraft other than

- moored balloons, kites
- unmanned rockets
- unmanned free balloons
- ultralight vehicles

Therefore, FAR Part 91 applies to UAS

Laws Lag Technology

To operate a UAS, you need a waiver to FAR 91

This is known as a

Certificate of Authorization (COA)

FAA COA

Federal Aviation Administration

Strict process that stresses aviation safety & planning

Limits where and how UAS can be flown

COA Requirements

Airworthiness

Aircraft Maintenance Plan

See And Avoid Plan

Lost Link Procedures

Spectrum Authorization

COA by Year

2009 - 146

2010 - 298

2011 - 313

2012 – 257

2013 – 545

(as of Dec 4)

Time consuming to get: 3-6 months

About $10,000 in administrative costs

COA Requirements

Research for the public good

Research by a public, non-profit entity

Aircraft air-worthiness certification

Ability to manage airspace

Ability to pilot aircraft

Commercial pilots license?

UAF COA

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO
University of Alaska, Fairbanks

University of Alaska, Fairbanks
Geophysical Institute, Poker Flat Research Range
P.O Box 757320
Fairbanks, Alaska, 99775

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

OPERATIONS AUTHORIZED

Operation of the Aeryon Scout Unmanned Aircraft System (UAS) in Class G airspace at or below 400 feet Above Ground Level (AGL) over the Clearwater and Snake Rivers, Idaho, as depicted in Attachment 1, under the jurisdiction of Seattle and Salt Lake City Air Route Traffic Control Centers (ARTCCs).

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

N/A

STANDARD PROVISIONS

1. A copy of the application made for this certificate shall be attached and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

SPECIAL PROVISIONS

Special Provisions are set forth and attached.

This certificate 2012-WSA-103 is effective from October 25, 2012 to October 24, 2014, and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.

See And Avoid

UAS pilot must possess a See and Avoid (SAA) capability

SAA for non-cooperative aircraft (no transponder)
Air Traffic Control (ATC) radar

Chase planes

Corrective lenses
Physical for pilot

Pilot Requirements

One pilot in command (PIC) at all times
PIC has passed the FAA Private Pilot examination
Pilots are not allowed to perform other duties, i.e. sensor

Visual line of sight operations
No further than 1/2 NM from the PIC
Altitude of no more than 400 feet AGL
During daylight hours only
No closer than 5 NM from any airport

An observer, in communications with the PIC

Airworthiness

The COA applicant must establish airworthiness and describe how airworthiness is maintained

Public entities can develop their own airworthiness guidelines, however the FAA may require proof of an ongoing airworthiness program

DoD: MIL-HDBK 516B

Air Force: AFPD 62-6

Army: AR 70-62

Navy and Marines: NAVAIRINST 13034.1C

Lost Link

In all cases, the UAS must be provided with a means of automatic recovery in the event of a lost link. There are many acceptable approaches to satisfy the requirement. The intent is to ensure airborne operations are predictable in the event of lost link.

"Navy operators lost control of an unmanned aircraft earlier this month and were unable to regain control before the aircraft entered restricted airspace around the U.S. capital."

Navy Times, 25 Aug 2010

Communications Spectrum

You many need Federal Communications Commission authorization to transmit on the radio frequencies used,

Except those in the unlicensed bands

- 900 megahertz
- 2.4 gigahertz
- 5.8 gigahertz

Encryption? Spoofing? Hi-jacking?

Laws Lag Technology

Fourth Amendment

Unreasonable Search – except from air

State Laws

Privacy Laws

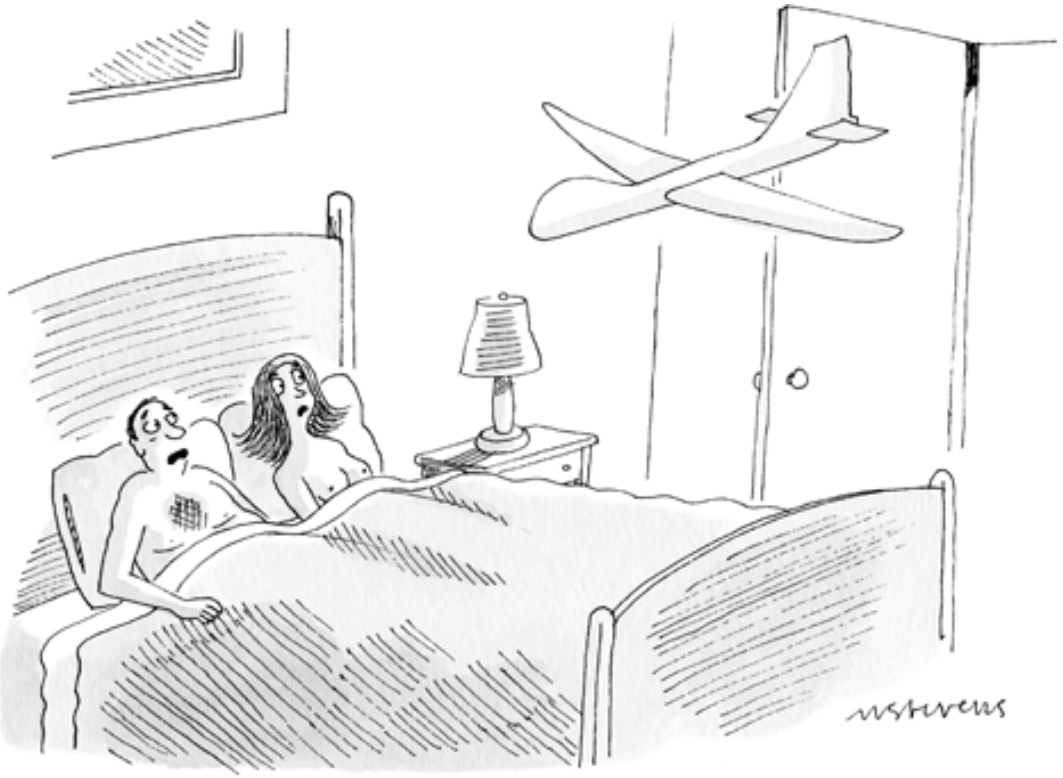
Peeping Tom Laws

Trespass Laws

Commercial Use

Recreational Use

Liability & Insurance



"Oh, no. My wife's drone!"

http://www.condenaststore.com/-sp/Oh-no-My-wife-s-drone-New-Yorker-Cartoon-Prints_i8534591_.htm

Fourth Amendment

Prohibits unreasonable searches and seizures and requires any warrant to be judicially sanctioned and supported by probable cause.

<u>Aerial photography & privacy</u>

Katz v. United States

California v. Ciraolo

Dow Chemical Co. v. United States

Kyllo v. United States

United States v. Jones

1974 Privacy Act

Fair Information Practice that governs the collection, maintenance, use, and dissemination of personally identifiable information about individuals that is maintained in systems of records.

- Applies to GIS & imagery data
- Requires written consent to disclose data about an individual
- Privacy protection requires database risk management, preventing breaches of data protection

Pirker Test Case (NTSB.7)

- FAA alleged that Pirker violated the commercial ban on UAS and also flew his 4.5 lb aircraft recklessly.
- FAA fined Raphael Pirker $10,000.

- March 6, 2014
- NTSB Judge Patrick Geraghty, struck down the fine and ruled that the FAA had no effective UAS rules.
- FAA has appealed.
- The full NTSB will review Geraghty's ruling.

Alaska HB 255

- March 13, 2014
- House Bill 255 sets standards for law enforcement aimed at protecting privacy.
- The law enforcement sections require agencies maintain a searchable record of each flight.
- UAS can only be operated by trained crews and that images are disposed or kept confidential, unless part of a prosecution.

Sen. Dianne Feinstein

March 16, 2014

Privacy concerns for the technology were “major.”

- When is a drone picture a benefit to society?
- When does it become stalking?
- When does it invade privacy?
- How close to a home can a drone go?
- Operator certification?

Drone Law Journal

Legal News & Info About Drones, UAVs and Remote-Controlled Model Aircraft

Legal controversy – Peter Sachs, Esq

- Enforceable law versus non-enforceable law.
- The federal government has no authority to regulate the operation of remote-controlled model aircraft.
- Remote-controlled model aircraft are not “aircraft,” as defined in federal statutory and regulation language.
- Why if used commercially, remote-controlled model aircraft are claimed to be aircraft.

Thank You & Questions

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