



## Learning to Fly

16.687

1. Pre-flight Aircraft with Instructor
2. Learn to recognize and control aircraft attitude
3. Learn to take off and land

Now you know how to fly a *working* airplane or helicopter. Typically takes 5-10 hours (people used to solo at 4-8 hours!).

Not adequate for an FAA certificate because what if you're the only pilot on board and the aircraft breaks? Or you get lost? Add another 40 hours.



## A good trainer airplane

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- Not too light (unstable)
- Not too heavy (inertia necessitates thinking ahead)
- Not too fast
- Not too much power (transition from 0 to 310 HP can be tough to manage)
- Reluctant to spin
- Tends to recover from stalls/spins if pilot lets go

Ideal examples: [Diamond DA-40](#), Cessna 172, Piper Warrior. Okay example: [Cirrus SR20](#).  
Marginal operating cost \$100-150 per hour.

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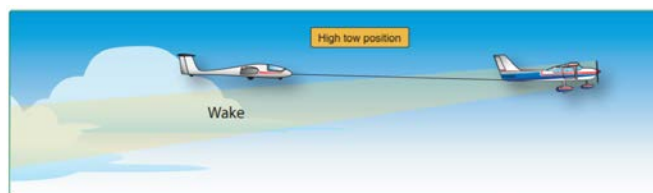
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## Glider: a better trainer airplane?

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- Join a club
- Pay \$50 per tow and \$0-50/hour
- Stay up all day (ridge lift out West) or for 15 minutes (Sterling, Massachusetts)
- Solo at age 14
- Captain Sully-style hero on every landing!



Source: public domain

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## A good trainer helicopter

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- Not too light (unstable)
- Reasonable rotor inertia for autorotations
- Rugged skids
- Reasonable operating cost

The only practical option: [Robinson R-44](#).

Marginal operating cost \$225-250 per hour.



## Getting an FAA Pilot Certificate

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- Pre Solo
- Solo
- Cross Country
- Checkride Preparation
- Private Pilot Certificate



Minimum 40 hours flight time



## Private Pilot Certificate

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- Carry friends, family, and colleagues in US-registered plane to any country on Earth
- Fly in reasonably clear weather
- Fly at night
- Fly to any public-use airport
- Fly for fun (without being paid)
- Fly what you learned in, e.g., a single-engine propeller-driven airplane, a helicopter, or a hot-air balloon

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## Congress, the FAA, and the Web

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- Congress passes *laws* to create and fund the FAA
- The FAA creates *regulations* that determine what is necessary to earn a certificate. Published in the [Code of Federal Regulations](#), Title 14 (the “FARs”) and then divided into parts (FAR 61 for pilots).
- Someone brags about pilot skills at a party? Look ‘em up in the online “[airmen registry](#).” Shows you a picture of the family Gulfstream? Type the tail number into Google!

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# Categories and Classes

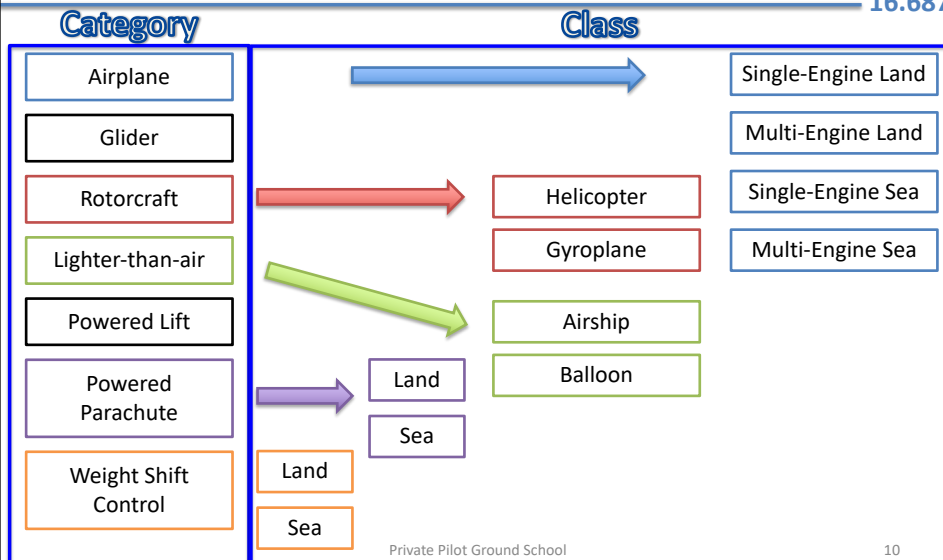
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- With respect to certification of AIRMEN
  - Category
    - Airplane
    - Rotorcraft
    - Glider
    - Lighter than Air
  - Class (of airplane category)
    - Single engine land
    - Single engine sea
    - Multi engine land
    - Multi engine sea



# Certificate Types Category & Class

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## FAA Pilot and Instructor Certification

Pilot Certificates (in order of increasing privilege)

- Sport Pilot
- Recreational Pilot
- **Private Pilot (focus of this course)**
- Commercial Pilot
- Airline Transport Pilot (ATP)

To the core certificate are added ratings, e.g.,

- Airplane Single Engine Land (fly a Cessna)
- Airplane Single Engine Sea (fly the Icon A5)
- Rotorcraft-Helicopter
- Glider
- Lighter than air
- Type ratings for heavy or turbojet-powered aircraft

Flight Instructor is a separate certificate with its own ratings:

- Single engine airplane ("CFI")
- Instrument airplane ("CFII")
- Multi Engine Airplane ("MEI")
- Rotorcraft-Helicopter ("CFI-H")
- Instrument Helicopter

Also: A "Remote Pilot" certificate with "Small Unmanned Aircraft System" Rating.

Note: There is nothing special about the "single engine land" rating, though this is where most people start.



## Categories and Classes

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- With respect to certification of AIRCRAFT

- Category
  - Normal (+3.8/-1.52g)
  - Utility (+4.4/-1.76g)
  - Acrobatic (+6/-3g)
  - Commuter and Transport



- Class
  - Airplane
  - Rotorcraft
  - Glider
  - Balloon
  - Powered Lift







# The Mother of All Bureaucracies

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Department of Transportation  
Act of 1966






Established 1967

Federal Aviation Act of 1956



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# Structure of regulations

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Code of Federal Regulations <http://www.ecfr.gov>

Title 14 – Aeronautics and Space

Most relevant parts:

- Part 1 – Definitions and Abbreviations
- Part 39 – Airworthiness Directives
- Part 43 – Maintenance
- **Part 61 – Pilot Certification**
- Part 67 – Medical Certification
- **Part 91 – General Operating Rules**

Title 49 – Transportation

Part 830 – Notification and Reporting of Accidents

<Title #> CFR <Part #>.<Regulation #>  
e.g. 14 CFR 61.56

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## Fun knowledge: Extra FARs

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- Air Carrier: FAR 119
- Charter: FAR 119+135
- Airline: FAR 119+121
- Certify a four-seater or small bizjet: FAR 23
- Certify a big bizjet or airliner: FAR 25
- Certify a small helicopter: FAR 27
- Certify a monster helicopter: FAR 29
- Sling load from helicopter: FAR 133
- Cropdust: FAR 137
- Your own airport: FAR 139
- Certify a flight school: FAR 141
- Certify a sim center: FAR 142
- Certify a repair station: FAR 145

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## 14 CFR Part 61

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- Title: “Certification: Pilots, Flight Instructors, and Ground Instructors”
- Meaning:
  - How to get a certificate
  - How to maintain a certificate
- This will be on the test!
- Sensible minimum standards, e.g., flight review every two years.



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## Certificate Types Ratings and Add'l Training

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- Instrument rating (14 CFR 61.65)
- Type ratings and add'l training (14 CFR 61.31)
  - Receive and log specific training
  - Aircraft-specific type ratings
    - Jets, MTOW > 12,500 lbs., or “other designated a/c”
  - High-performance airplanes
    - Engine with greater than 200 HP
  - Complex airplanes
    - Flaps, retractable gear, & adjustable pitch propeller
  - etc.

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## 61.3 - Documents

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- Fly with the following:
  - Pilot certificate
  - Medical certificate (except BasicMed)
  - Photo ID (driver's license, passport, etc.)
- Documents can be inspected (not confiscated!) by:
  - The Administrator (the FAA)
  - NTSB
  - Federal, State, or local law enforcement
  - TSA

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## 61.15 & 61.16 Drugs & Alcohol

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- Drugs (and alcohol) are bad
  - Grounds for denial up to 1 year, revocation, or suspension
  - This includes motor vehicle violations
    - Must be reported to FAA
  - Also includes refusing alcohol test
  - Same standards for 20-year-old and 60-year-old
  - Marijuana: questions on BasicMed and standard Medical forms

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## 61.19 - Cert. Duration

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- Remote Pilot: two years
- Flight Instructor: two years
- Everything else: *never* expire



[Howard DGA-15P](#) and P-51 Mustang at Sonoma Valley Airport (0Q3).





## 61.23 - Medical Cert.

16.687

- Medical Certificates
  - Third class - for most private operations (Valid for 60 calendar months if under 40 on exam date; 24 months if over 40)
  - Second and First class for commercial and airline pilots
  - Sport pilot and Glider: not required
  - BasicMed: start with Third Class and then go to doc every 48 months (61.113(i) limits operations)

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## 61.35 & 61.37 Testing

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- Need endorsement from instructor to take tests (61.35)
- Do not cheat on tests! (61.37)
  - Barred from taking any test for 1 year

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## 61.43, 61.45, & 61.49 Testing

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- Applicant provides working aircraft
- Three possible outcomes:
  - Pass
  - Discontinue (weather, mechanical)
  - Fail
- Retake failed test after additional instruction (areas at examiner discretion)

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## 61.51 - Logbook

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- Must log flight time to show
  - test requirements
  - currency requirements
- Usually log all time
  - lower insurance premiums
  - establish business use for taxes
  - the memories!

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## 61.53 - Medical Deficiency

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- Don't fly if you're sick or wouldn't meet medical certificate requirements



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## 61.56 - Flight Review

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- FAA: Every 24 calendar months...
  - 1 hour ground and 1 hour flight lesson with instructor (at a minimum)

*or*

  - Pass a test for a pilot certificate
- Insurance for complex aircraft: Training every 12 months.

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## 61.57 - Recent Experience

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- To carry passengers:
  - 3 Take-offs and landings in past 90 days
    - As “sole manipulator” of the controls
    - If tailwheel airplane, to a full stop
- To carry passengers at night:
  - Must meet requirement at night (1 hour after sunset to 1 hour before sunrise)
  - Landings to a full stop
- In category, class, and type (if applicable)

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## 61.60 - Change of Address

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- Notify FAA in writing within 30 days
- After that, pilot privileges suspended until you find a stamp.



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## Part 61 Subpart C – Student Pilots



## 61.87 - Solo Requirements

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- Pass a written test (given by CFI)
  - Rules, airport, and aircraft characteristics
- Receive training on certain maneuvers
- CFI will sign-off for solo flight
  - Required every 90 days
  - Night flight is a separate sign-off



## 61.89 – Solo Limitations

16.687

- No passengers
- For training only
- Must have visual contact with surface
  - Can't go above broken or overcast layer
- CFI can add additional limitations

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## 61.93 - Solo Cross-Country

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- Demonstrate proficiency on navigation and additional maneuvers
  - CFI sign-off
- Generally require sign-off for each flight
  - CFI checks flight plan and weather
  - Good weather only

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## 61.95 – Solo next to A320s

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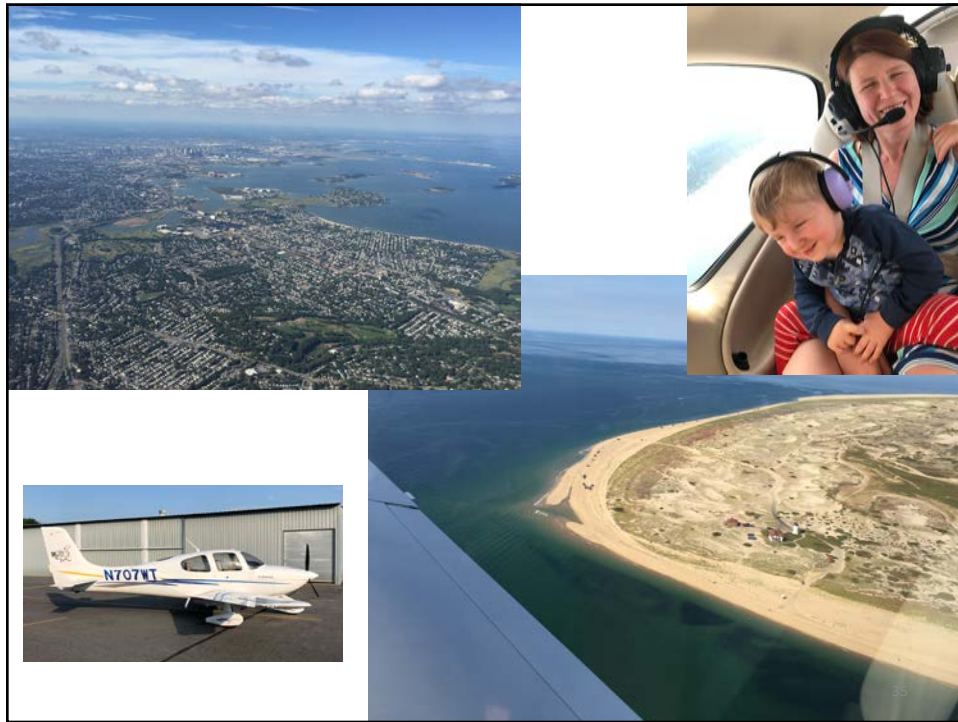
- Require training and sign-off for flight in Class B *airspace* (e.g., Logan's airspace)
- Require training and sign-off for flight to Class B *airport* (e.g., Salt Lake City)
- No student operations at some Class B airports, e.g., Logan. See [FAR 91 Appendix D](#)

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## Part 61 Subpart E – Private Pilots





## 61.103 - Eligibility

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- 17 years old (except gliders & balloons: 16)
- Read, speak, write, and understand English
- Take the knowledge test
- CFI sign-off to take the practical test
- Meet experience requirements



## 61.107 - Flight Proficiency

16.687

- Read regulation to see what maneuvers you need to do, e.g., for ASEL:
  - (viii) Slow flight and stalls;
  - (ix) Basic instrument maneuvers;
- More detail available in [Airman Certification Standards](#) (formerly “Practical Test Standards” or “PTS”)

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## 61.109 - Aeronautical Experience

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- 40 Hours minimum
  - 20 hours of training from CFI
  - 10 hours of solo practice

(55 hours typical for young/serious students)

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## 61.109 - Aeronautical Experience: Training Requirements

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- 20 Hours of Training from CFI
  - 3 hours cross-country training
  - 3 hours night flight
    - 100 NM cross-country flight
    - 10 takeoffs and landings to a full stop
  - 3 hours instrument training
  - 3 hours test prep within 2 calendar months of test

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## 61.109 - Aeronautical Experience: Solo Flight Requirements

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- 10 Hours of Solo Flight
  - 5 hours cross-country
  - 1 cross-country flight of 150 NM with one leg of 50 NM
  - 3 takeoffs and landings to a full stop at an airport with an operating control tower

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## 61.113 - Privileges and Limitations

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### “Private” flying only

- No operations for compensation or hire
  - Except if incidental to, and in furtherance of, a business
- Must pay pro-rata share of flight costs
  - Fuel, oil, airport expenditures, rental fee
- Can tow a glider!
- Can fly for charity (see also 91.146)

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## Regulation versus Insurance

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- What would it look like to replace the entire system with one line: “It is illegal to fly without insurance”?





## What did you learn?

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- FAR 61 Badge system, like Boy/Girl Scouts (FAR 91 is about day-to-day flying)
- Everything except drones hangs off Pilot and CFI certificates
- Minimums: 20 hours dual; 10 hours solo; 10 hours either
- Stay FAA-current by flying every quarter and with an instructor every two years

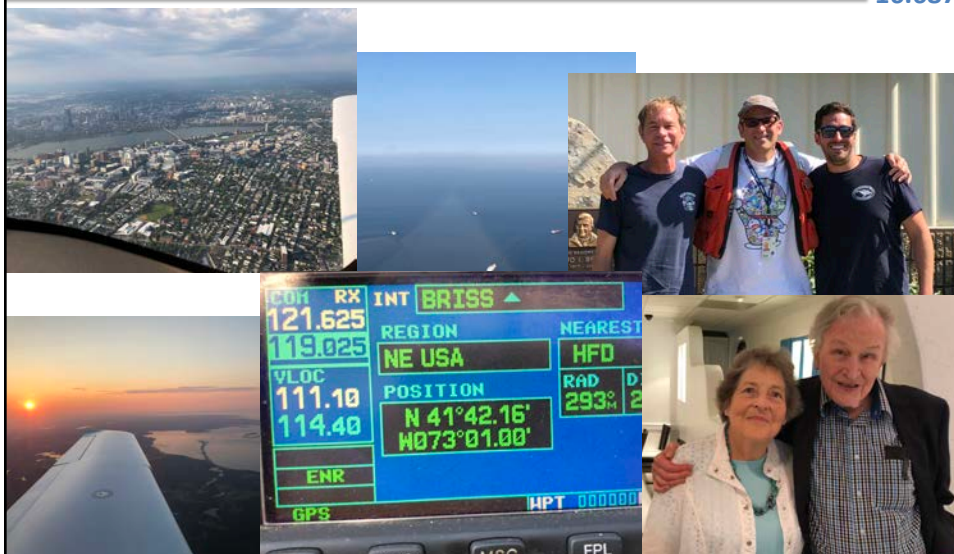
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## Questions?

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