How To Be Certified as a sUAS Remote Pilot (FAA Part 107)

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Introduction

As there are rules for driving a car on public roads, so there are rules for flying a drone in national airspace (NAS).   Or consider this analogy from Ken Heron:

> *If you have a RC car, you're not allowed to drive it on the interstate highway.*

In the United States, to pilot a drone (small UAS) that weighs less than 55 lbs you must abide by a set of rules; there are two rule sets.

- Recreational use, as defined by Section 349 of the FAA Reauthorization Act of 2018

- Part 107 of the FAA rules

- Explicit waiver to Part 107 rules

The purpose of these rules is to ensure safety. This includes safety for any people in the area around your flight and also safety for manned aircraft (aircraft with people on board). There may be other reasons; for example, flying within the boundaries of a national park is generally prohibited for a variety of reasons.

What rules are common to both Part 107 pilots and recreational pilots?

Most of the rules stated at the following FAA web link apply to all pilots. The notable exception is that certified pilots can fly for commercial purposes and recreational pilots cannot.

https://www.faa.gov/uas/recreational_fliers/

What's the difference between the Part 107 and recreational rules?

Certified pilots are required to know far more aeronautic information and are required to demonstrate that knowledge via a detailed written exam.

While recreational pilots are required to have a vague awareness of controlled airspace, certified pilots are required to have detailed knowledge of controlled airspace with the ability to understand VFR charts.

In some circumstances, a certified (Part 107) remote pilot can request a waiver to fly beyond the normal rules; recreational remote pilots cannot.

How to Study for the Part 107 Exam

Theoretically, class instruction does offer a distinct advantage of providing insight to tricky questions that may occur on the exam. If you do attend a class, you should at least read the study material before your class, because the amount of information is considerable. Trying to learn all the information in one class may feel overwhelming, like drinking from a fire hose.

This guide(you are reading now) is for people who choose self-study. The general idea is to revisit the material until you are comfortable enough and confident enough to take the exam. It can be a long process but you gain a long-lasting understanding. As a class may occupy a day or two, you likely gain a solid grasp of the information to pass the test, but may not retain a long-term understanding of the material.

Stuff you need to know for certification

Here are a couple links to introductory information and the most important link - the Remote Pilot Study Guide. You will be tested on a thorough knowledge of the Remote Pilot Study Guide.

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

https://www.faa.gov/training_testing/testing/acs/media/uas_acs.pdf

Remote pilot study guide   (FAA-G-8082-22)
https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/media/remote_pilot_study_guide.pdf

How to read VFR charts

The Aeronautical Chart User's Guide includes information regarding both VFR (visual flight rules) and IFR (instrument flight rules). Because a sUAS remote pilot needs to know VFR and not IFR, you only need the first 40 pages of this user guide. After studying this, you quiz yourself simply by reading VFR charts on-line and paying attention to any airspace or symbols you don't thoroughly understand.

https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/aero_guide

This quick-reference may be a convenient study tool.
https://ticc.tamu.edu/Documents/OtherInfo/VFR_Symbols.pdf

Pilot's Handbook of Aeronautical Knowledge

The Pilot's Handbook spans more than 500 pages and includes information that is only needed by manned aircraft pilots, not remote pilots. However, this document can be useful for some information that is not covered as thoroughly in the remote pilot study guide. In particular, chapter 14 discusses

airport operations and the Part 107 exam may require you to understand the terminology illustrated in Figures 14-39 and 14-40.

Practice Questions

There are many on-line sources for sample questions, including videos. Search for: Part 107 practice test.

The first time I answered practice questions, I scored a lame 40%, far worse than I had expected. However, as I continued to study, I would occasionally dig up yet another set of practice questions, until I was consistently scoring around 90%.

When Ready To Take The Exam

The testing process is based upon the same processes that pre-existed for aircraft and helicopter pilots. When you arrive at a testing center, they will ask which test you are taking.

1) Locate a KTC (knowledge testing center) near you

2) Telephone CTS (Computer Assisted Testing Service) to make an appointment.
   Personally, I scheduled an appointment just 2 hours after my phone call.

3) There is a $150 fee (credit card) payable when making your appointment.
   Cannot bring informational material with your during the test, e.g. notes or a smart-phone.

4) The exam is implemented as a computer program. You will sit at a computer in a quiet room.
   Two hour time limit and your remaining time is always displayed; you do not need a watch.
   Personally, my time to complete the test was a bit more than one hour.

5) Upon completion, your score is reported immediately along with a unique identifier for your individual exam. The test center will provide a printout with your exam ID and you will need this number to apply for your certificate.

6) Apply for your certificate on-line via the IACRA website.
   (The government agency that oversees all aviation exams is IACRA.)

7) After seven business days, IACRA will notify you that a temporary certificate is available on-line.
   Login to IACRA and print your temporary cert.

FYI: Additional Sources of Information for Remote Pilots

Apart from passing the certification exam, pilots must access specific information before every flight.

VFR sectional charts online

While your drone or a mobile app may provide information to you regarding controlled airspace restrictions, the VFR (visual flight rules) charts can still be an essential resource.

> http://vfrmap.com/
>
> http://www.airnav.com/airports/
>
> ForeFlight (subscription)
>
> SkyVector (free)

Authorization within Controlled Airspace

"Controlled airspace" is very common. You can fly an sUAS within controlled airspace only with prior authorization. Typically, you can plan your flight and submit it using a mobile app (for smartphone or tablet) then await authorization. Your flight may be approved automatically within seconds or may require manual analysis, which can take days before your plan is either authorized or rejected.

Authorization involves two things which are <u>not</u> covered within Part 107: LAANC and UAS Facility Maps. Digitally submitting a flight plan to Air Traffic Control is possible through software applications that support LAANC – Low Altitude Authorization and Notification Capability. Automatic authorization (authorization within seconds) can happen if your flight plan conforms to the UAS Facility Map.

Within controlled airspace around an airport, major airports commonly divide the controlled airspace (pertaining to that specific airport) into a grid wherein each block states an altitude limit for small UAS. This is the UAS map (a.k.a. UAS grid) for the facility (e.g. airport). If you plan a flight that does not exceed the stated altitude limit, you might receive a prompt automated response.

If the local facility (airport) does not support LAANC, then you must go get authorization via this FAA web site: https://faadronezone.faa.gov/

Check for controlled airspace and plan a flight

Several mobile apps are available which show a map of the airspace, with UAS facility grid, allow you both plan a flight, and easily communicate with ATC (via the LAANC system). Although information from the FAA has historically referred to a mobile app called B4UFLY, I personally experienced multiple problems with this app and long ago abandoned it in favor of another.
LANNC-enabled apps include AirMap, KittyHawk and Skyward.   And more have enrolled to support LAANC in the near future.

Be aware that any one app may or may not show heliports and TFRs.

A very good source of information is: to https://www.dji.com/flysafe/geo-map.
DJI built-in geo-fencing can automatically prevent your drone from leaving the ground if you are in restricted airspace. This can be essential if you are flying a DJI drone, but can be generally useful to any drone pilot. The DJI system for identifying/mapping controlled airspace is different from the FAA!

Special Use Airspace (SUA) and Temporary Flight Restrictions (TFR)

Some sources visually show active TFR, prohibited areas, and available weather reports. SkyVector is the most intuitive, as it allows you to hover over any one and click to see detailed information. In my experience, SkyVector is also much more responsive than sua.faa.gov.

sua.faa.gov

1800wxbrief.com … or call 1-800-wxbrief

Pilotweb.nas.faa.gov

notams.aim.faa.gov/notamSearch

ForeFlight (subscription)

SkyVector (free)

Where to check weather conditions

Of course, we all have many sources for weather reports but may not be familiar with sources peculiar to aviation pilots.

Both https://skyvector.com and http://www.aviationweather.gov will show all METARs visually, where you can either hover over or click on any one to see the details.

FYI, if you need a cheat-sheet to help you read METAR:
https://aviationweather.gov/static/help/taf-decode.php

If you are craving even more, here's more information from a manned aircraft pilot perpective:
  https://bit.ly/2oV2Yak.

Development of Part 107

Informational only. In developing the Part 107 rules, the FAA documented the comments from many sources. While this is not required reading, it does provide great insight into the rationale behind Part 107.

https://www.faa.gov/uas/media/RIN_2120-AJ60_Clean_Signed.pdf

Other drone rules

Apart from FAA rules, you must watch for local restrictions. For example, some public spaces have signage stating no drones allowed. Some states prohibit launching a drone within a state park.

Some national restrictions exist but are specified by agencies other than the FAA. For more information, see: https://jrupprechtlaw.com/drone-regulations .

1. U.S. Fish and Wildlife Service Regulations

2. National Marine Fisheries Service (a.k.a. NOAA Fisheries)

3. National Marine Sanctuaries (ONMS) Regulations

The National Forest Service may issue drone restrictions specific to a particular area. In the New Hampshire, with regard to the White Mountain National Forest, the Forest Service has detailed rules where drones are allowed.