RPAS Pilot Certificate Overview

This document is an overview of the Drone Trust RPAS Pilot Certificate courses. There are two options to complete drone training via self-paced online theory courses or a three-day classroom-based course for groups.

Our courses follow the format of a theory component followed by a practical flight assessment with a RPAS flight examiner.

Practical drone flying instruction is also available.

The following courses are available:

Online

Online courses can commence at any time that suits you.

Basics. This online course is a free theory only introductory course designed to provide basic information on the Civil Aviation Rules relating to drones. It's a great place to start and only takes a few minutes to complete. Please note that this course does not meet the CAA requirements of airspace knowledge which allows the operation of a drone within 4km of an airport or heliport.

30 min duration.

Privileges: None.
Qualification: While you will receive a completion certificate there are no formal qualifications attached to this course. It provides a very basic overview of the drone rules.

Part 101. This online course is suitable for the recreational drone pilot or for commercial activities conducted within the limitations of the Civil Aviation Part 101 Rule. This course takes you through the airspace knowledge requirements of Part 101 and includes a practical flight assessment with one of our CAA approved RPAS Flight Examiners.

Privileges: .   Operations within 4km of an aerodrome or heliport in accordance with Part 101 rules.
Qualification: Upon successful completion of the course you will qualify for a RPAS Pilot Certificate to Part 101 standard.

Theory 4-6 hours duration
Practical 1.5 hours

Professional. This online course incorporates all the Part 101 course content which is bundled together with additional material to form the Professional Part 102 level course. This course takes you through the airspace knowledge requirements of Parts 101 and 102 as well as including a practical flight assessment with one of our CAA approved RPAS Flight Examiners. It extends your

knowledge to the higher standard than Part 101 to a Part 102 level. The course is suitable to for pilots who are using a drone in a professional capacity or their clients require a high standard of qualification.

This course is a requirement for pilots who are operating for a Part 102 unmanned air operator certificate holder (UAOC).

Theory 8-10 hours duration
Practical 1.5 hours

Privileges .   1. Operations within 4km of an aerodrome or heliport in accordance with Part 101 rules.
                  2. Allows the pilot to work for a Part 102 unmanned air operator certificate.
Qualification: Upon successful completion of the course you will qualify for a RPAS Pilot Certificate to Part 102 standard.

Classroom based
The content from our courses the covered via a two-day classroom-based theory course followed by the practical assessment on day three. This course is designed for groups (minimum 5). It is based on the Part 102 level training, however, can be adapted for Part 101 level training if required.
Contact us to discuss your requirements.

Privileges .   1. Operations within 4km of an aerodrome or heliport in accordance with Part 101 rules.
                  2. Allows the pilot to work for a Part 102 unmanned air operator certificate.
Qualification: Upon successful completion of the course you will qualify for a RPAS Pilot Certificate to Part 102 standard.

Who are we?
Flight Test NZ is a Civil Aviation Authority certificated Part 141 aviation training organisation. We have been providing specialised manned and unmanned aviation training since 1998.

Flight Test NZ operates its drone training via the Drone Trust brand. https://dronetrust.com/

To access the course, go to the Drone Trust website, register for the course. As soon as this and the payment has been made you will be able to commence the course. Upon completion of the theory course, book in for the practical flight assessment. The fee covers both the theory and practical assessment.

Course Syllabus:
Theory
- Part 101 RPAS Rules *
- Operations at or near aerodromes *
- Visual Navigational charts *
- Airspace and Special purpose airspace *
- Airshare *
- Altitude and Height *
- Contacting Air Traffic Control *
- Part 102 process

- Part 102 exposition and how an unmanned air operator certificate (UAOC) works.
- Part 102 exercises
- Maintenance
- Training and competency
- Logging of flights
- Pre flight procedures
- Meteorology
- GPS limitations
- Fit and proper person process
- Notams
- Radio communications
- Health and safety
- Reporting
- Online examination (both Recreational and Professional courses)
- Practical Flight Assessment using your own UAV. It is designed to allow for demonstration to a CAA approved examiner of your competency by completing the following tasks.

*Part 101 course only.

Practical flight assessment tasks and requirements.

A   Pre-flight and general knowledge

General Knowledge.
Verbal questions on your general knowledge of the CAA rules, and airspace related to flying drones. These are drawn from the theory course.

Flight planning - Assessment of hazards and risks.
- Conduct a simple assessment of the flight area. Identify verbally to the examiner any reasonable potential hazards and risks to persons and property in the area of operation. (e.g. children playing, power lines, birds etc.)
- Identify any current weather concerns, e.g. rain or high winds
- Airspace considerations: Identify the type of airspace at the testing location and explain requirements for land owner, ATC permissions, proximity to airports and heliports.
- Explain Airshare flight logging process.

Battery management - How do you manage your UAV batteries?
- Identify the likely flight time available on your drones battery at the time of the test.

Drone components - Demonstrate a basic understanding of the mechanical components of your UAV.
- Refer to manufacturer's operations manual for your drone.
- Assemble your drone correctly (e.g. propellers on correctly, all camera attachments correctly mounted)

Flight controller operations - Demonstrate a basic understanding of your controller and its various functions.
- Show that you know the purpose of all the controls on your controller. (refer to manufacturer documentation to prepare).

- Make sure you understand the mechanical aspects and systems of your UAV. (read the operations manual)

Failsafe functions - Each drone has built-in functions that are engaged in certain circumstances. These are specific to each drone model. Describe the functions built into your drone.
- What happens when the battery gets low?
- What happens when the drone gets out of signal range.

Pre-flight check - Is the drone ready to fly safely?
- propellers correctly attached
- motors spin freely (no grinding noise)
- batteries are charged
- no loose wires, or cracked structure

B   Flight tasks (To be completed in either ATTI or non-ATTI mode):

Note: that to select Atti mode on DJI drone the controller must be set in All Modes not GPS Mode.
The green lights will turn to orange when this is correctly set.

Manual or reduced automation flight skills (ATTI/Rate mode)
- Demonstrate your ability to fly your drone in GPS-stabilised ie non-ATTI/Rate and then in non-GPS stabilised ie ATTI/Rate modes.
- You must be able to maintain a stable horizontal position in ATTI mode, over a point on the ground, compensating for any effects from wind.
- You also must be able to complete a smooth flight around a series of patterns (see below) while in ATTI/Rate mode. This requires compensating manually for the effects of wind drift.
- **Note: The drone used for the flight test must be capable of selecting ATTI/Rate mode.**
  You must know how to activate and deactivate this mode on your drone.

Take-off and landing.
Demonstrate a normal take-off, hover over a cone and return to the landing pad.

Fly in a prescribed pattern
Your flight examiner will ask you to complete a series of patterns around a set of cones. You will be asked to fly in a straight line to each cone, stopping before proceeding to the next one. You must be proficient in flying drone both toward and away from you.
Be proficient in opposite control inputs when flying towards yourself. Some variations include:

- Horizontal letter "M" pattern. Starting at the bottom of the left hand side fly away from you along the left hand side;   then diagonally to the bottom of the "V";   diagonally away to the top of the right hand side of the "M";   Fly along the right hand side with the drone facing towards you.
- Vertical box pattern above two cones. Climb vertically without drifting away or sideways from the start point, then fly horizontally without climbing or descending to left or right as dictated by the examiner with the drone facing in the direction of travel, descend vertically to a low level , then horizontally back to the start point.
- Figure of eight.   Fly in a horizontal figure of eight path around two cones. This should be a smooth continuous controlled flight, allowing for wind drift at a constant height.

The critical component in all of these manoeuvres is the ability to correct your path when you get deviated from the desired flight path due to wind or other control input factors.

Speed /emergency descent
This is an essential safety manoeuvre in which you descend rapidly from a high altitude. It would be employed for example if an aircraft suddenly enters your flight area.

- Conduct an emergency descent as required by your instructor. Typically, this would be from approximately 200 ft (60 m)
- Employ a descending corkscrew pattern to maintain control over rate of descent. This is important to allow a recovery at a safe altitude of about 30 ft (10 m).
- Note that rapid descents can result in loss of control, and impact with the ground if the recovery is not initiated early enough. Practice this manoeuvre first by initiating recovery at a sufficiently high altitude to be safe.

Distance and height estimation
Your examiner will ask you to position your drone at a distant point. Without looking at the controller, estimate the distance and height from your location. You should be able to estimate with a moderate amount of accuracy.

Hazard awareness during the flight
The examiner will ask you to identify hazards that occur or might occur during your flight and what actions you would take.
For example:
- A person walks into your area of operation
- A low-flying helicopter suddenly enters your airspace
- Loss of signal connection to the drone
- Un-commanded fly-away
- Sudden loss of control (if this occurs near controlled airspace notify authorities/ATC).

Practical flight training

The theory course will expand on the flight assessment tasks.

The flight assessment, especially at 102 level, is not recommended for a novice drone pilot without experience in the use of flying in atti mode. We expect that you are proficient at flying the above manoeuvres with your UAV (drone) before you commence the flight assessment with recommended minimum experience as follows:

Total flight time	10 hours
ATTI or equivalent mode	2 hours or 8 batteries
UAV types.	CAA advise that each candidate must be tested in Atti mode (or equivalent). The common DJI range of UAV's are suitable however **DJI Mavic** and **Spark** are unable to simulate Atti mode and therefore cannot be used for the flight assessment. Contact us if you need guidance.

Note: We strongly recommend that you review the above tasks. Take time to practice these manoeuvres and be proficient at flying your UAV **especially in ATTI mode**.

Practical training varies a lot depending on your skill levels and previous drone use. however eight batteries using atti mode is a good number to aim for. We have used the following training model

successfully for many of our clients. It is however your choice if you want to take advantage of formal flight instruction.

1. Complete our on line theory course.
2. Become familiar with your drone from the operators instructions.
3. Spend an hour training with an instructor. This will enable you start with the right skills and not commence with bad habits. The cost of instructor training is not included in the course fee.
4. Practice, practice, practice in atti mode. This is a CAA testing requirement for RPAS pilot certificates and is the area where many people fail.
5. If necessary a second instructor session and further solo practice prior to the flight assessment.
6. Refresh your knowledge on theory prior to the practical flight assessment so you are ready to answer any general questions from the RPAS examiner during the practical flight assessment.
7. Complete the flight assessment.

Need Practical Training.

If you have not flown a drone before we appreciate that this is all a bit daunting with lots of rules and names to consider. The theory course will demystify this however what about the actual flying of the drone, especially in Atti mode. This requires skill and is not something that can be learnt in one or two flights. We have instructors available around the country who can set you up with the correct operating procedures allowing you to practice solo in your own time. Spending an hour or two with the instructor is a great way to start the journey to become a skilled pilot.

Weather

All UAV flying is subject to the weather, so this may impact on the practical assessment. While we will do our best to achieve the flight assessment on that day, we may need to reschedule to a later date. In this event, the examiner will work with you to arrange a suitable date.
This will require you to travel back to the flying site at your own expense.

Course Validity

Each RPAS pilot certificate has a validity of 3 years. Upon expiry the ability to operate within 4km of an airport or heliport lapses, however you can still fly beyond this 4 km limitation provided you comply with all the other 101 rules.   A short on line refresher course and flight assessment is required to renew the certificate for a further 3 years.