

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 with either a three-day classroom-based course for groups or via a self-paced online theory course. All courses include a one on one practical flight assessment with a RPAS flight examiner.

The following courses are available:

Online

Recreational. 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.

Privileges: . Operations within 4km of an aerodrome in accordance with Part 101.

Qualification: Upon successful completion of the course you will have a RPAS Pilot Certificate to Part 101 standard.

Professional. This course incorporates the Recreational course content which is bundled together with additional material to form the Professional course. It extends your knowledge to the higher standard at Part 102 level. It 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 (see more on this below)

Privileges . Operations within 4km of an aerodrome in accordance with Part 101 rules.
Allows the pilot to work for a Part 102 unmanned air operator certificate

Qualification: Upon successful completion of the course you will have 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 . Operations within 4km of an aerodrome in accordance with Part 101 rules.
Allows the pilot to work for a Part 102 unmanned air operator certificate holder or UAOC (see more on this below).

Qualification: Upon successful completion of the course you will have a RPAS Pilot Certificate to Part 102 standard.

Flight Test NZ is a Civil Aviation Authority certificated Part 141 aviation training organisation. We have been providing specialised aviation training since 1998. Flight Test NZ operates its drone training via the Drone Trust name. <https://dronetrust.app/>

Note: Both the online and classroom courses are for pilot training, therefore they are not the same as a Part 102 Unmanned Aircraft Operating Certificate.

Individual pilots need to complete an approved pilots' Part 102 course (such as these courses) before operating for a Part 102 UAOC organisation.

Course Syllabus:

- Part 101 RPAS Rules
- Operations at or near aerodromes
- Navigational charts and airspace
- Part 102 process
- Part 102 exposition
- 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
- Written examination
- 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. A significant part of the assessment are discussions with the examiner which double as a learning opportunity.

Practical flight assessment tasks and requirements.

Pre-flight and general knowledge:

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 permissions, including 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 manufacturers operations manual for your drone.
- Assemble your drone correctly (e.g. propellers on tightly, 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

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

Manual or reduced automation flight skills (ATTI/Rate mode)

- Demonstrate your ability to fly your drone in GPS-stabilised (non-ATTI/Rate) and non-GPS stabilised (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 cones on the ground while in ATTI/Rate mode. This requires compensating manually for the wind.
- The drone used for the flight test must be capable of flying in ATTI/Rate mode. You must know how to activate and deactivate this mode on your drone.

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.

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 possible examples may include:

- Letter "M" pattern
- Rectangle pattern

Figure of eight flight path

- Fly in a horizontal figure of eight path around two cones. This should be a smooth continuous controlled flight, allowing for wind drift. The critical component here is the ability to correct your path when you get deviate due to wind or other factors.

Speed /emergency descent

This is an essential safety maneuver 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 maneuver 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).

The course will expand on the flight assessment tasks

The flight assessment, especially at 102 level, is not recommended for a novice UAV pilot. We expect that you are proficient at flying the above maneuvers with your UAV before you complete 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 the early model 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 maneuvers and be proficient at flying your UAV especially in ATTI mode.

Weather

All UAV flying is subject to the weather, so this can impact on the practical assessment. We will check the forecast and advise if there is a likelihood of weather impacting on the following day. While we will do our best to achieve the flight assessment on that day, we may need to postpone and 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.

RPAS Part 102 Unmanned Air Operator Certificate

Introduction

The purpose of this document is to provide an overview for persons or organisations wishing to gain Civil Aviation Authority (CAA) of NZ Part 102 Unmanned Air Operator Certificate or UAOC, to operate a RPAS.

The UAOC is issued to a organisation or company, not the individual pilot. Individual pilots are required to complete training to a Part 102 level (see above for Professional or classroom based course) by gaining the RPAS Pilot Certificate. The UAOC and RPAS Pilot certificates are separate. One or more pilots may fly for the UAOC organisation. Likewise, it is common for a one person organisation flying for his / her own UAOC.

The UAOC has the advantage that it may include exemptions from compliance with the Part 101 rules (think of Part 101 as the general rules for UAV flying), provided procedures covering that activity maintains safety acceptable to CAA. Examples are: flying at night or not gaining permission from landowners. This gives the pilot more scope to carry out a wider range of RPAS activities than they would be if operating under the constraints of the Part 101 rules.

Part 102 is a CAA rule which set out the requirements which must be adhered to be issued a Part 102 operating certificate. Furthermore, it sets out the ongoing obligations to ensure the operator remains compliant with the rule to provide a safe operating environment for the public and other aircraft. These are incorporated into an exposition (which a fancy way of say a series of manuals) It is a live

document and therefore should not be viewed as a document which can be ignored once certification is issued.

Examples of what can be included in the exposition are: training for pilots, competency checks, standard operating procedures, specific operating procedures for non 101 operations, reporting and maintenance.

Each UAOC has an expiry date. Typically, they are initially issued for 12 months and following an audit by CAA extended up to 5 years. A renewal process takes place after that usually renewing for 5 year intervals. This is common throughout aviation.

The process takes time and is dependent on how complex each UAV operator's business is. We cannot say how long this will be until we have a better understanding of the type of operation and what is involved, the time taken to prepare the exposition and CAA processing time. Many variables are involved here. Our recommendation is to allow for at least a few months.

Flight Test NZ and Drone Trust provides pilot training, ongoing competency, Part 102 UAOC manual preparation and safety systems. We are experienced in these areas and have a good working relationship with CAA. We are proud of the quality work we do in the RPAS area of aviation. We do not use a "off the shelf, one size fits all" approach as the exposition is unique to your operation.

Further information about our operations can be obtained via our website: <http://flighttestnz.co.nz/> or <https://dronetrust.app/>

We are happy to answer any questions you may have.

Process

The process of gaining a UAOC is a three-stage process. We need your input and will work with you to provide an exposition that not only reflects your operation but minimises the CAA involvement and therefore costs towards certification.

(1) UAV Pilot training. This is specific to each individual pilot who you may employ. Qualifications required are the RPAS Pilot Certificate to Part 102 standard as described above.

(2) The second part is the preparation of the exposition. This can be completed concurrently with the pilot training. We commence this part of the process with an on-line survey to accurately identify what type of flying you are conducting, deviations from the Part 101 rule, and organisational details.

A Part 102 exposition is a document that is unique to your operation. While there are some common features with other RPAS operators, each exposition must describe how **your** operation functions. We therefore cannot provide an accurate price for a Part 102 exposition until we have a more information on what type of operation you wish to conduct. Following the survey and discussions with you we will advise more accurate pricing. We will do this before you commit to anything. It would be unfair to expect you to go into an opened ended agreement.

The fee for the exposition preparation is separate to the UAV pilot training.

The exposition is prepared and then submitted to CAA for their assessment and subsequent issue of the Part 102 UAOC. The exposition is a complicated document and must be in compliance with the Part 102 rule. It covers a wide range items. Some examples are: who the accountable senior or prime persons are, standard operating procedures of how you conduct UAV normal and emergency operations, maintenance, training, pilot competency, re-current training, safety management systems, drug and alcohol procedures, hazard management, manual reviews, audits, reporting to CAA.

The UAV pilot training referred to above (ref 1) links in and meets the initial pilot training requirements of the exposition. In addition to this pilot in house induction training is most likely to be required for items such as admin processes, health and safety. These are usually conducted in house by your own people. If you have more than one pilot, then every pilot must go through the training process in accordance with your Part 102 exposition.

Part of the exposition process is the need for the senior persons (known as Prime Persons) named in the exposition to go through a fit and proper person process. This requires obtaining Justice Department records and traffic offences. It may also involve gathering of information from other countries you have lived in.

(3) CAA assesses the exposition. We work closely with them. Our time for this is included in the exposition preparation fee, however CAA fees for their time are in addition to our fees. They currently charge \$284 including GST per hour. We are confident that the quality of the exposition we produce will minimise the CAA time. It is in everyone's interest to ensure the exposition is well prepared before it is submitted to CAA.

We won't abandon you at this point. We will provide training in the use of the manual and happy to answer questions you may have. Understandably there is a limit to the time we can provide for future assistance. If there is a significant amount of work involved, we will discuss this with you and provide pricing as applicable.

Contact us if you require more information on the UAOC, courses or tasks. Our goal is to have a safe and competent RPAS pilot consistent with type of operation you are conducting.