



Australian Government
Civil Aviation Safety Authority



Drone careers student guide



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cover image: CASA

inside cover: Drones are used in archaeology to take detailed aerial photos, helping researchers find and map sites more easily | Wessex Archaeology



The drone industry in Australia

Drones are becoming popular in Australian aviation, offering many new career opportunities. As technology advances and new uses for drones emerge, demand for skilled experts is rising.

Drone pilots are in high demand. In February 2024, drone pilots surpassed traditional aviation pilots for the first time in Australia. The Civil Aviation Safety Authority (CASA) reported there were 33,388 licensed uncrewed pilots compared to 30,843 licensed crewed pilots.

The industry needs more than just pilots. Engineers design, build, test, and improve drones, including motors, sensors, and software. Data analysts process and interpret data collected by drones, like images, videos, maps, and measurements.

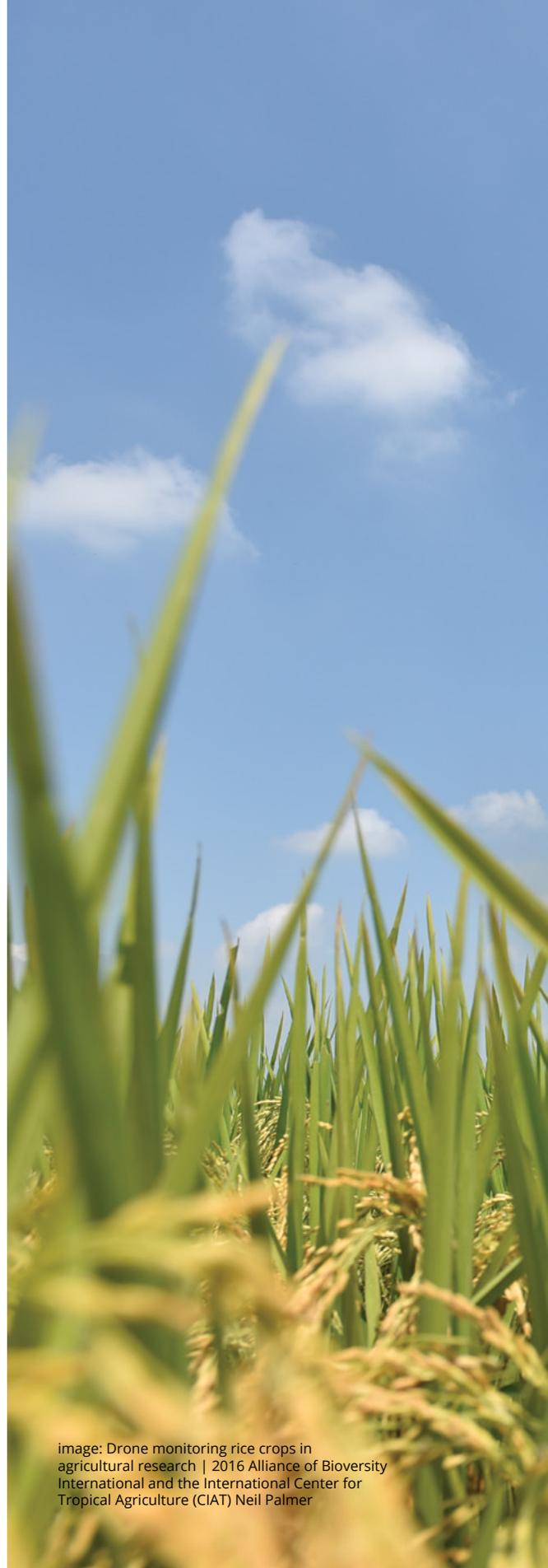


image: Drone monitoring rice crops in agricultural research | 2016 Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT) Neil Palmer



What is a drone?

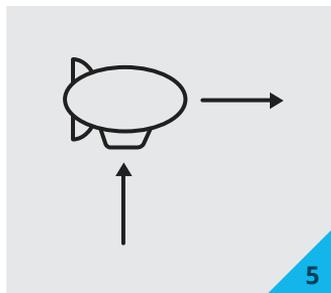
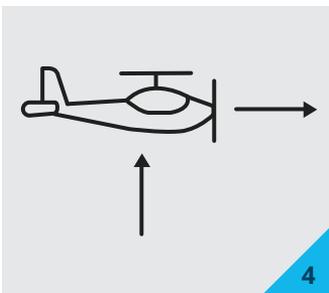
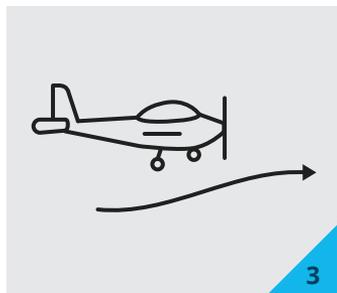
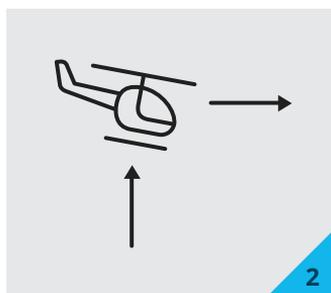
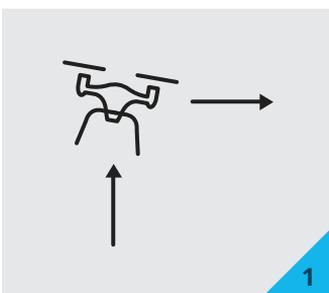
A drone is a remotely controlled aircraft with no pilot, crew or passengers on board.

People refer to drones in different ways. CASA and the International Civil Aviation Organization (ICAO) refer to drones as model aircraft or remotely piloted aircraft (RPA). Model aircraft are drones used for sport or recreation, while RPA refers to drones used for business or work.

Others call drones remotely piloted aircraft system (RPAS), uncrewed aerial vehicles (UAV) and uncrewed aerial systems (UAS). The word 'system' includes everything needed to operate the drone like the ground control station and communication links.

There are different types of drones:

1. multirotor
2. single rotor/
helicopter
3. aeroplane/fixed-wing
4. powered-lift
5. airship.



Drones also get categorised by their weight:

- **Micro** › 250 g or less
- **Very small** › more than 250 g, but not more than 2 kg
- **Small** › more than 2 kg, but not more than 25 kg
- **Medium** › more than 25 kg, but not more than 150 kg
- **Large** › more than 150 kg



image: Renee Bartolo conducts a safety briefing | Renee Bartolo

Dr Renee Bartolo

Environmental research

Since gaining her PhD in remote sensing from Charles Darwin University 20 years ago, Renee Bartolo has worked in remote sensing and earth observation. Seeing the advances being made in drone technology, she was keen to use drones in her own research. She holds a RePL and a ReOC and is now the chief remote pilot for the Department of Climate Change, Energy, the Environment and Water.

Renee works in remote areas on leading-edge projects with her team and First Nations rangers. 'We are working on collaborative projects and providing training in some of our national parks, including Kakadu and Uluru-Kata Tjuta', Renee says. 'These projects include drone surveys of threatened wildlife species and mapping of Buffel grass, which is a weed found throughout central Australia.'

The growing uses for drones

Here are just some of the things drones are being used for.

Surveying and mapping

Drones can create exact 3D maps of the ground, even in thick vegetation. These maps can help with land management, infrastructure projects, archaeology and mining. Scientists also use drones to survey crops, forests and wildlife.

Inspections

Drones help inspect hard-to-reach or dangerous structures, like high-voltage powerlines and bridges, and confined spaces like storage tanks. Drones also help with maintenance inspections on infrastructure at factories and mine sites. Some aircraft manufacturers, including Airbus, use drones to inspect large passenger aircraft like the A-380 during maintenance.

Aerial photography and filming

In the film industry, drones offer a cheaper, safer alternative to helicopters. Drones capture unique angles, like fly-through shots, and help explore locations during pre-production. Media outlets use drones for news coverage and investigative journalism. They are also popular for making real estate and marketing videos.



image: Adobe stock | poco_bw



image: Drones help fight bushfires by detecting flames from a distance | Brad Strobel USFWS

Agriculture

Drones help farmers work more efficiently. They assist with monitoring crops for disease, identifying areas that need spraying or fertilising, and help to monitor livestock. Farmers also use drones ensure animals have enough food and water, and to muster livestock.

Emergency services

Drones support bush firefighting by providing real-time aerial surveillance, even at night. They help firefighters find hot spots, track fire fronts, assess fire suppression efforts, and reach remote areas. In natural disasters like floods and earthquakes, drones can reach inaccessible or dangerous areas. They help response teams with damage assessments and gather images for rescue and rebuilding efforts. In search and rescue operations, drones can find missing people in difficult terrain. In urban areas, small drones can enter burning or unsafe buildings to search for trapped people.

Law enforcement

Police use drones for traffic monitoring, surveillance, and mapping crime or accident scenes. In hostage or high-risk situations, drones provide aerial views to help authorities make informed decisions while staying at a safe distance.

Delivery services

Urban drone delivery is growing worldwide as drones can bypass city traffic. In Australia, they deliver medical supplies and fast food. In remote areas, they deliver life-saving vaccines and medicines.

Entertainment

Drone racing is a fast-growing international sport. Known as FPV (or first-person view) racing, operators wear goggles and pilot their drones through a 3D racetrack at high speeds using only live footage from onboard cameras. Drone light shows are a cheaper alternative to fireworks. Swarms of drones fly in coordinated formations, creating art using vibrant storytelling and synchronised lights.



image: Ben and Rudi on location capturing drone footage from Canopy Tours in Rotorua, New Zealand | Rudi and Ben

Rudi and Ben

From drone racing to Hollywood aerial photography

Rudi and Ben were on the team that brought home the Gold Medal for Australia at the 2018 Fédération Aéronautique Internationale (FAI) World Drone Racing Championship. Rudi was also crowned the Individual FAI World Champion. At 15 years old, that success was the stepping stone for their careers in the film industry.

Ben first saw Rudi at a drone racing event on the Gold Coast, and Ben was hooked on the sport. A few months later they met at a local Brisbane race and quickly became friends. They rose through the drone racing competition ranks from state to national and finally international level. Unfortunately, after the 2019 season, the COVID pandemic suddenly ended the competition.

To keep busy, Rudi began using his racing drones with a Go-Pro for filming. Meanwhile Ben was working with commercial drones specialising in stable drone aerial videography and production. They became well-known in the media and film industry, and in 2023, their company, ProFly Cinema was born.

‘Production companies used to use helicopters for aerial shots – now you can use a drone to achieve better results, saving production time, money and resources with improved safety,’ Ben says.

How do I become a commercial drone pilot?

If you're looking to become a commercial drone pilot, think about your strengths and interests to find roles which fit your skills, expertise and experience.

Do you enjoy photography, farming, environmental science, construction or emergency services, or are you more into technology and data analysis?

Before you fly a drone for work or business, make sure you have the right qualifications and approvals:

- If your drone is very small (2 kg or less) or you're flying over your own land (with a small drone under 25 kg), you must get an operator accreditation.
- If your drone is more than 2 kg, you need a remote pilot licence (RePL).
- If you're not working for someone with a remotely piloted aircraft operator's certificate (ReOC), you'll need to get one yourself.

Drone registration

- If you use a drone for work or business, you must register it, no matter how much it weighs. This includes drones used for selling photos or videos, inspecting sites or equipment, security work, or monitoring livestock and crops. Any drone used for activities that are not for sport or recreation must be registered with CASA.
- Registering your drone is quick and easy, and you can do it online in just a few minutes. The registration lasts for 12 months, and you must be at least 16 years old to register a drone. More details are available on the CASA website.

Getting your operator accreditation

Follow these quick and easy steps to get an operator accreditation:

1. **Create a myCASA account** – this is CASA's online system where you apply.
2. **Get an aviation reference number (ARN)** – if you don't have one, apply for it. If you do, link it to your account.
3. **Pass the online safety quiz** – it's free, and you need at least 85% to pass.
4. **Download your certificate** – it's valid for 3 years and you can save it to your digital wallet.

Getting your remote pilot licence

Remote pilot licence (RePL)

If you want to fly a drone weighing more than 2 kg for work or business, you need a RePL. If you get a RePL, you do not need an operator accreditation.

RePL training

RePL training generally takes about 5 days to complete:

- 3 days of theory
- 2 days practical training.

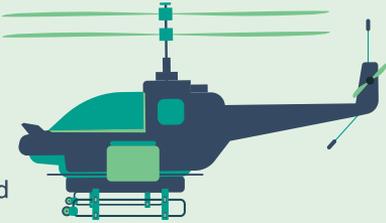
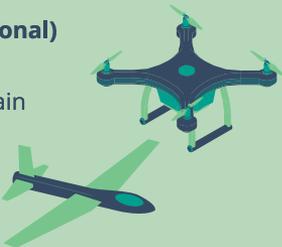
Some training providers let you do the theory part online at your own pace, but the exam and practical training must be done in person.

You must train with a CASA-certified provider. There are more than 50 approved training providers across Australia – find the list on the CASA website.



image: Adobe stock | Denis Rozhnovsky

Remote pilot licence and operator accreditation privileges

Remote pilot licence and operator accreditation privileges*	Remote pilot licence (RePL) <ul style="list-style-type: none">» RePL holders may operate an RPA under a remotely piloted aircraft operator certificate (ReOC) for complex operations» RePL holders may operate RPA (under a ReOC), micro RPA, very small, small and medium excluded RPA, and model aircraft (sport and recreation)» RePL holders are not required to obtain RPA operator accreditation 
	RPA operator accreditation privileges* <ul style="list-style-type: none">Excluded RPA operations<ul style="list-style-type: none">» Very small RPA – more than 250 g, not more than 2 kg – for activities other than sport and recreation (i.e. hire and reward) in the standard RPA operating conditions» Small RPA – more than 2 kg, not more than 25 kg – for activities over your own land (land owned or occupied by the owner of the RPA) in the standard RPA operating conditions» RPA operator accreditation has been required since January 2021Micro RPA operations<ul style="list-style-type: none">» 250 g or less for commercial activities (i.e. hire and reward)» RPA operator accreditation has been required since January 2021  
	Recreational privileges <ul style="list-style-type: none">Model aircraft (sport and recreational) operations<ul style="list-style-type: none">» There are no requirements to obtain accreditation or hold an RePL. 

* Accreditation is free and valid for three years
An RPA operator accreditation allows a person of at least 18 years of age to supervise a person under 16 to fly an RPA.

Practical experience

Once you pass your RePL theory and practical tests, you must log 5 hours of flying your drone under the standard operating conditions (the drone safety rules).

Upgrading your RePL

With more theory and practical training, you can upgrade your RePL to fly larger or different types of drones in more complex ways. For example, if you plan to fly:

- beyond visual line-of-sight (BVLOS) outside controlled airspace, you need to pass a theory exam (70% pass mark) and a practical test.
- in controlled airspace, you will also need an aeronautical radio operator's certificate (AROC).

More details are available on the CASA website.

Remotely piloted aircraft operator's certificate (ReOC)

You need a ReOC if you want to:

- fly drones commercially using your RePL but don't work for a business that already has one, or
- run your own drone business and hire licensed pilots.

To get a ReOC, you must:

- **Create operational manuals** – these must cover your drone operations, including safety, flight planning, emergency procedures, and pilot qualifications.
- **Nominate a Chief Remote Pilot** – this is a qualified remote pilot responsible for managing drone operations and compliance.
- **Submit your application** – send your application and documents to CASA.
- **Pass a Chief Remote Pilot assessment** – CASA will assess your nominated chief remote pilot's skills and knowledge.

More information is available on the CASA website.

Flying a drone for education, training, or research

You can fly a drone up to 7 kg for educational, training, or research at a recognised institution, like a school or university, without needing an operator accreditation or RePL.

If you're paid to fly or using the drone to promote or advertise your school or university, this is commercial flying. You must get an operator accreditation or RePL and register your drone.

Matt Sturdy

Pioneering BVLOS capabilities

Matt Sturdy is leading a revolution in drone innovation in Australia with beyond-visual-line-of-sight operations (BVLOS) taking centre stage. Matt is a drone specialist at the forefront of long-range operations for the Skyport Drone Services and Carbonix partnership program. He learned the basics of flying aeroplanes and drones at Bournemouth University in the United Kingdom. Now based in Australia, Matt holds a remote pilot licence with a sub-25 kg endorsement, and an aeronautical radio operator's certificate. Their ReOC also has a powered-lift endorsement to fly BVLOS outside controlled airspace.

Matt's focus in BVLOS operations is using drones to collect geo-spatial data. These are fixed-wing drones with wingspans ranging from 3.4 metres to a formidable 6 metres.

image: Matt Sturdy doing his part in the beyond visual line-of-sight revolution, pictured with a Swoop Aero Kookaburra Mk3 | Skyports





image: SwissDrones SDO-50 | Ronnie Fahy

Ronnie Fahy

The benefits of drones and BVLOS

Ronnie Fahy is the CEO of Xplorate Pacific, an organisation working with companies to provide uncrewed aerial intelligence gathering services using sizeable drones developed for the energy, infrastructure, surveillance and logistics industries.

Ronnie is bridging the gap between traditional aviation and drones by gathering aerial intelligence using drones in beyond visual-line-of-sight (BVLOS) operations.

Xplorate holds a ReOC to operate drones commercially, as well as CASA approvals to fly BVLOS.

‘The benefit of using RPA is very safety oriented, we’re not putting people in the sky,’ he says. ‘For example, this tech allows us to fly closer to powerlines when undertaking line surveying, and new line construction or repairs.’

‘The extra benefit is getting more accurate data, meaning high-quality actionable insights, lowering CO₂ emissions and reducing costs for our clients.’

The SwissDrones SDO-50 can carry multiple payloads and deliver high-fidelity data. The drones are equipped with sensors and technologies capable of capturing detailed and accurate data related to the landscape, structures, powerlines etc.

‘This is equivalent, if not better, than the traditional crewed airplane or helicopter,’ Ronnie says.

‘... We are seeing huge changes in the energy, logistics and powerline industries. I’m convinced that in 10 years, you’re not going to see a human in a helicopter working on powerlines. And it’s all benefiting safety!’

Glossary

Term	Meaning
AAM	Advanced air mobility is an emerging form of aviation using new technologies (such as hydrogen/electric power) to transport people and goods in cities and regionally.
Aeronautical	Everything to do with designing, building or operating an aircraft.
Aircraft	A machine able to fly, especially an aeroplane, helicopter, or drone.
Aviation	Everything to do with flying aircraft.
BVLOS	Beyond visual line of sight: the ability to fly a drone beyond the pilot's literal line of sight. You need special permission and training to do this.
CASA	Civil Aviation Safety Authority – the federal government body which looks after non-military aviation safety in Australia, including the safe operation of drones.
Drone	An aircraft controlled remotely by a 'pilot' not onboard the aircraft.
Drone safety app	CASA-verified apps which use location-based maps to show where you can and can't fly your drone according to aviation legislation.
FPV	First-person view - A technique that enables a drone pilot to see a live video feed from the drone's onboard camera, by using a display screen or video goggles, with a wireless, real-time connection to an on-board video camera.
Fixed-wing drone	A drone with a fixed wing like an aeroplane, rather than rotors like a helicopter.
LIDAR	Light Detection and Ranging is a method of remote sensing used on some drones to create digital 3D replicas of the real world.
Model aircraft	Drones or uncrewed aircraft flown for recreational purposes.
Multicopter/multirotor	Drones with multiple rotors, typically 4 (quadcopters), 6 (hexacopters), or 8 (octocopters), known for their stability, manoeuvrability, and vertical take-off and landing (VTOL) capabilities.
No-fly zone	An area where drone flights are restricted or prohibited. Typically established around airports, government buildings and sensitive infrastructure to ensure safety and security.

Term	Meaning
ReOC	Remotely piloted aircraft operator's certificate.
RePL	Remote pilot licence.
Rotor	A rotating part of the drone that includes the motor and the propeller. Rotors enable the drone to lift off, hover, and manoeuvre through the air.
RPA	Remotely piloted aircraft – another term for drones or uncrewed aircraft flown for commercial purposes.
RPAS	Remotely piloted aircraft system – the drone plus the ground control station, communication links, and any other equipment needed to operate the aircraft.
Swarm	A group of drones, flying together as a unified and coordinated entity; for example, as seen in light shows at public events.
UAS	Uncrewed aerial system – the drone plus the ground control station, communication links, and any other equipment needed to operate the aircraft.
UAV	Uncrewed aerial vehicle: a drone or uncrewed aircraft.
Uncrewed aircraft	A generic term for drones, RPA and model aircraft.

A drone is flying in the upper left corner of the page. The background is a scenic landscape with a river, green fields, and trees under a clear blue sky.

For more information

CASA is a government body that ensures the safety of aviation in Australia. CASA oversees aviation safety and promotes safety awareness to make safe skies for all.

Some websites you might find helpful:

- casa.gov.au
CASA website.
- casa.gov.au/drones
A section of the CASA website dedicated to drones.
- flightsafetyaustralia.com/drones
Flight Safety Australia section focused on drones.
- knowyourdrone.gov.au
A CASA website for recreational drone flyers providing advice on safe flying, the basic operating rules, a safety quiz on the rules, and a list of drone safety advocates.
- knowyourdrone.gov.au/drone-safety-apps
CASA-verified drone safety apps use location-based maps to show where you can and can't fly your drone according to aviation legislation. Both mobile and web-based apps are available.
- drones.gov.au
The Department of Infrastructure, Transport, Regional Development, Communication and the Arts website shares the latest policy news, government reports on the drone industry and developments such as advanced air mobility.
- aaus.org.au
The Australian Association of Uncrewed Systems is Australia's peak industry body for uncrewed systems, representing the drone industry as well as the emerging advanced air mobility (AAM) sector.

casa.gov.au

