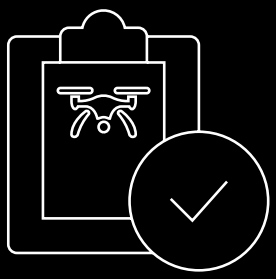


CHAPTER 4: DURING EVERY FLIGHT

One RPA at a time (CASR 101.238)

You must not operate more than one RPA at a time.

Maximum operating height

(CASR 101.085)

The maximum height a micro or excluded RPA can be flown is 120 m (400 ft), which is about the height of a 35-storey building or the length of a football field.

Crewed aircraft do not usually operate below a height of 150 m (500 ft) unless they are near an aerodrome or performing some form of aerial work such as an emergency service operation. Operating RPA at or below a height of 120 m (400 ft) aims to provide a 30 m (100 ft) buffer between RPA and crewed aircraft.

When at the maximum height of 120 m (400 ft), you must be aware of the elevation of the natural surface over which you are operating your RPA. If the surface elevation decreases – over a ravine, for example – your RPA must descend. When clear of the ravine and over rising terrain, your RPA may once again climb providing it doesn't exceed the maximum height of 120 m (400 ft) or encroach on the no-fly zone in non-controlled airspace (see Figure 11).

Image | **Neil Palmer** | CIAT

It is your responsibility to know the height and altitude of the RPA at all times during a flight. Most RPA operating in Australia do not have sensors to provide the operator with an indication of height. Unless the operating area is completely flat, the RPA height will only be accurate when the RPA is over the position it was first turned on (initialised).

Figure 11: Relationship between height and altitude with changes to the elevation of the natural surface

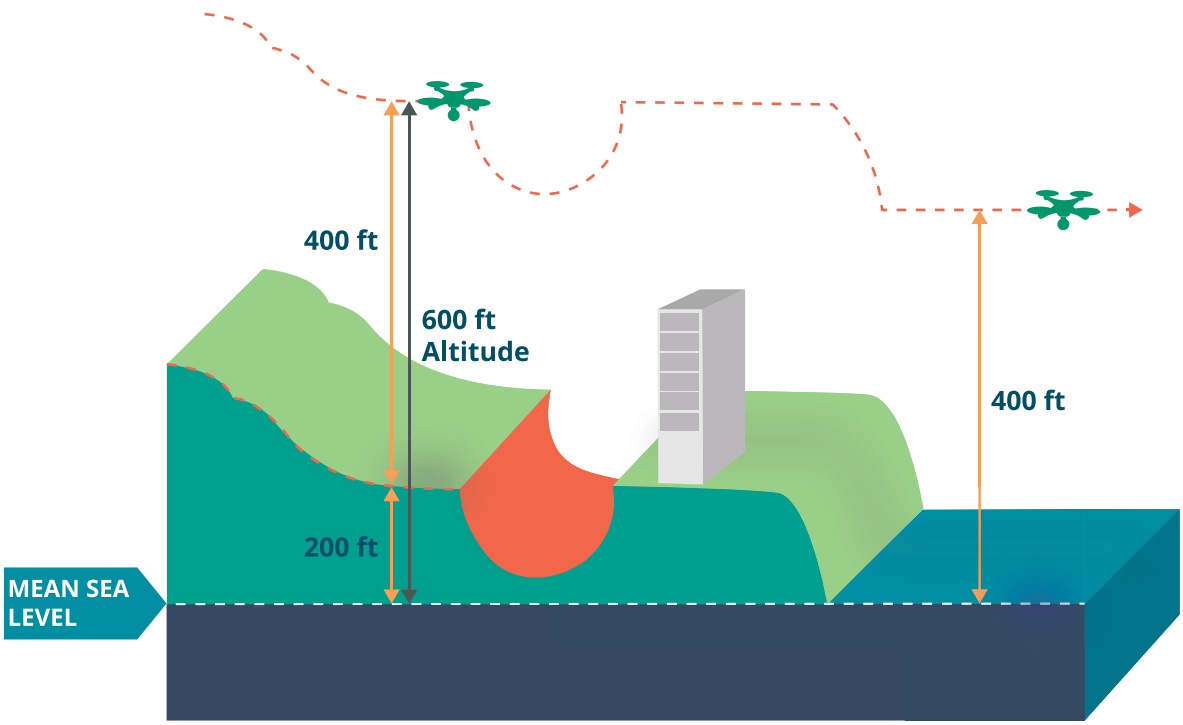


Image | **Jonathan Lampel** | unsplash.com

Weather limitations (CASR 101.095)

You must not operate an RPA without CASA approval in cloud, thick fog, at night or whenever you do not have at least 5 km visibility. You must operate an RPA only when you can see the RPA with your own eyes.

Operating in cloud, mist, fog, rain, dust or smoke can reduce:

- your ability to maintain visual line of sight
- your ability to see and avoid other aircraft or obstacles.

Wind and temperature

All RPA can be affected by wind, temperature and other environmental factors. Many RPA are not designed to be flown in moisture, snow, sleet or rain. An RPA should only be operated within its manufacturer's documented limits.

Operating an RPA outside the manufacturer's recommended limits increases risk of failure.

Daylight

All RPA must be operated only during the daytime.

Day means the time between morning civil twilight and evening civil twilight. Civil twilight times can be obtained from Geoscience Australia.

The easiest way to ensure that the RPA is operated by day is not to operate after sunset or before sunrise.

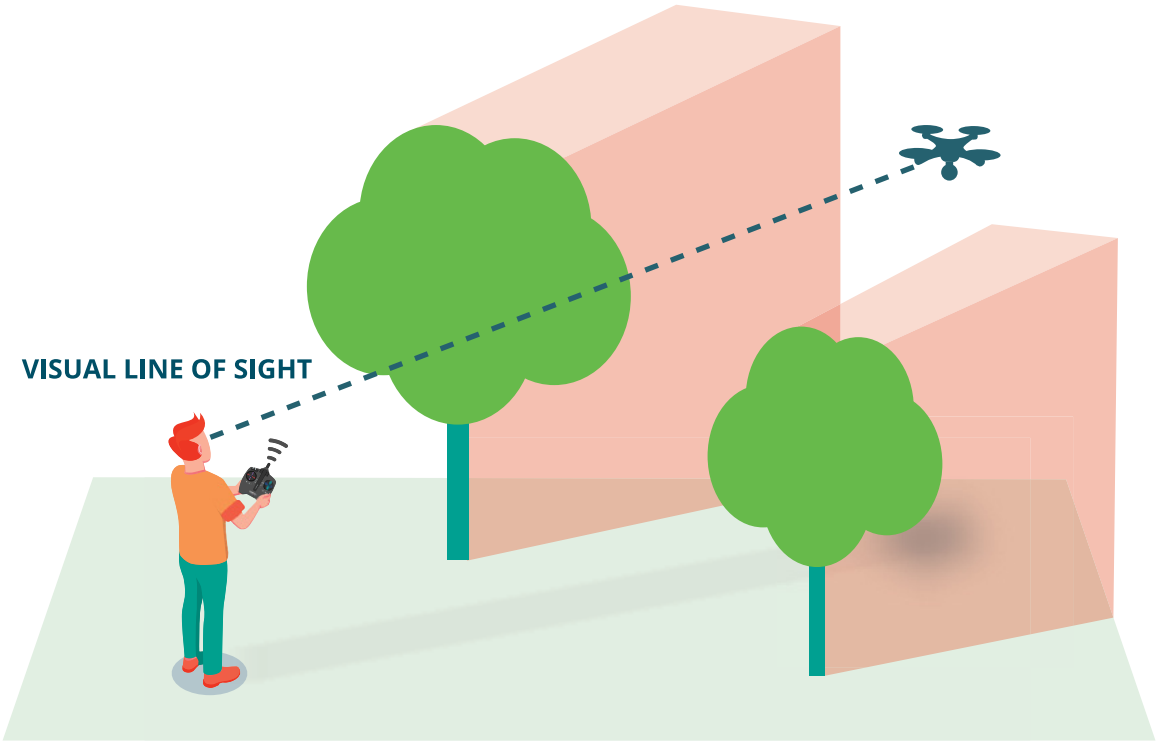
Visual line of sight (CASR 101.073)

An RPA must be operated within the visual line of sight of the person controlling the RPA (see Figure 12). You must always be able to see, orient and navigate the RPA with your own eyes and not view it through a device. You may use prescription glasses, contact lenses or sunglasses while operating an RPA.

You must not operate the RPA from a position where an obstacle may block your view of the RPA.

You must not navigate the RPA using the view provided by an onboard camera (referred to as first person view). This may be used if part of the modelling club is in designated areas.

Figure 12: Unaided visual line of sight



Populous area (CASR 101.025)

A populous area is an area where people are living or gathered for some purpose, and where, if an RPA were to fail due to a fault, it could pose an unreasonable risk to the life, safety or property of a person who is in the area. A crowded beach, a busy road or a sporting event may constitute a populous area from time to time (see Figure 13).

Figure 13: Simplistic representation of populous area

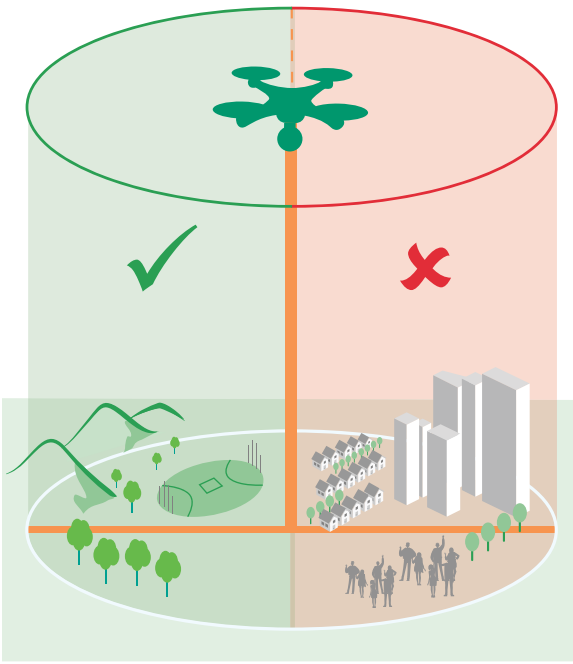


Image | **Jay Wennington** | unsplash.com

Operations near people

(CASR 101.245 (8))

You must not operate an RPA closer than 30 m (100 ft) laterally to a person, unless that person is assisting you or has duties essential to the operation of your RPA. You must not operate an excluded RPA in a populous area (see Figure 14).

Keeping at least 30 m (100 ft) from people provides a buffer zone in case you lose control of the RPA or there is a system failure. This area is also referred to as an *exclusion zone*. The 30 m (100 ft) exclusion zone must be measured from the point on the ground directly beneath the RPA.

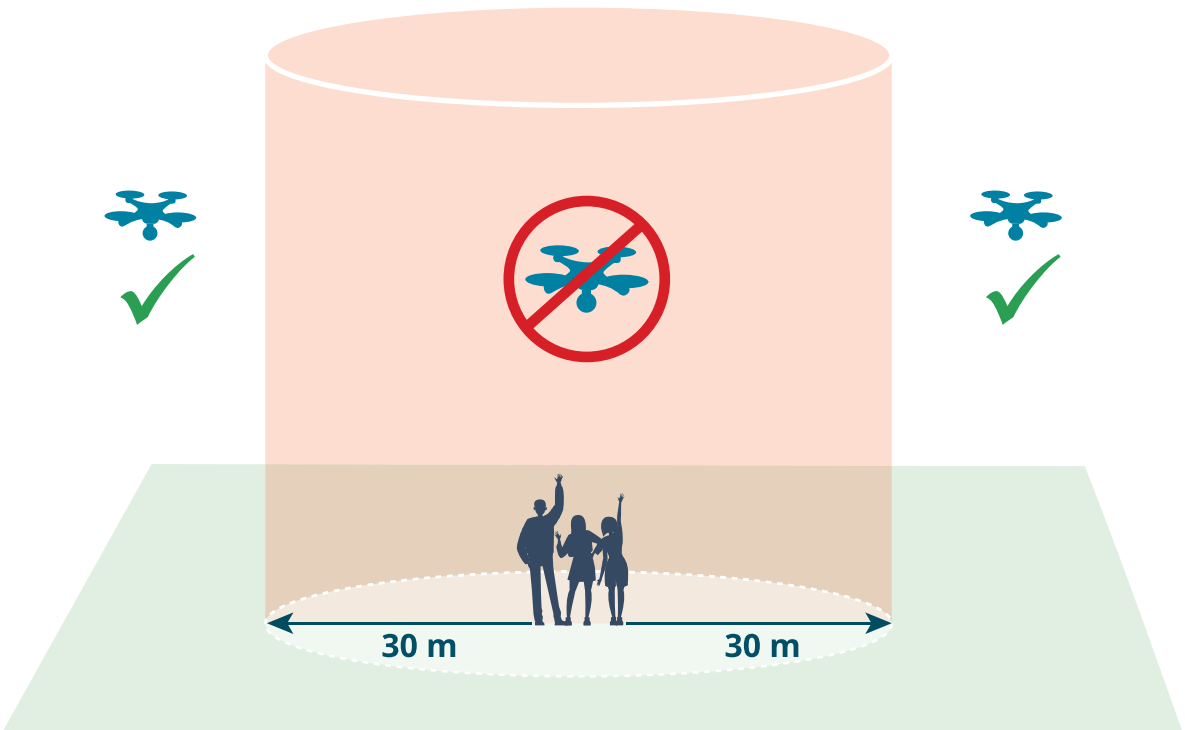
The 30 m (100 ft) measurement is a lateral measurement. It does not allow the RPA to be flown above people at any time during flight.

Dropping objects from an RPA (CASR 101.090)

You are permitted to drop or discharge an object from an RPA; however, it may only be done if you do not create a hazard to another aircraft, person or property.

If you do drop an object, you should consider the weight and size and the potential for it to drift. The performance and safety of the RPA may also be affected by the additional weight.

Figure 14: The 30 m rule



Operating with care and skill

(CASR 101.055)

You must ensure the RPA is not operated in a way that creates a hazard to another aircraft, person or property.

An RPA can be dangerous, particularly if it is not operated with care and skill. What is hazardous will depend on the circumstances and the controller should always consider the risk the RPA may pose to aircraft, people and property in the vicinity.

Keeping clear of public safety operations (CASR 101.238)

RPA must not be operated over or near an area of a public safety or emergency operation. This includes operations such as:

- firefighting
- law enforcement
- emergency medical services
- search and rescue.

During public safety and emergency operations such as firefighting, both crewed and remotely piloted aircraft are often used. In such situations, these aircraft cannot operate if there is a risk of collision with an unknown RPA. A collision between even a very small RPA and a crewed aircraft has the potential to be catastrophic. Where there is a benefit, a person in charge of conducting a public safety or emergency operation may give permission for you to operate your RPA in the same area.

Permission is generally only given in exceptional circumstances and only to RePL holders operating under a ReOC who have established procedures and protocols in place with the public safety or emergency response agency.

Carriage of dangerous goods

Some RPA operations may be subject to the 'carriage of dangerous goods' regulations (for example where an RPA is fitted with a recovery device such as a ballistic parachute system including a pyrotechnic charge). You should familiarise yourself with the requirements. See the CASA website at casa.gov.au/operations-safety-and-travel/safety-advice/dangerous-goods-and-air-freight/understanding-dangerous-goods.

Autonomous RPA operations

(CASR 101.097)

Autonomous operation of an RPA is not permitted. You must be able to control the RPA during all stages of flight.

Automation – as opposed to autonomy – can improve the quality, accuracy and precision of an RPA operation. This means operating to a pre-programmed flight plan or utilising subject tracking is permitted. However, you must ensure that you can always immediately override the automation and resume control of the RPA.

You should never put your radio control transmitter down or leave your remote pilot station during flight.

Image | **Robdownunder** | flickr.com

Checklist 4 – During every flight

If you cannot comply with the checklist items below, you must not take off or, if already airborne, you must safely land.

Fly only one RPA at a time	☐ Yes	☐ No
Do not operate your RPA in an autonomous mode	☐ Yes	☐ No
Remain at or below a height of 120 m (400 ft)	☐ Yes	☐ No
Fly during daylight only	☐ Yes	☐ No
Fly in good visibility (5 km)	☐ Yes	☐ No
Fly clear of cloud	☐ Yes	☐ No
Always keep your drone in sight	☐ Yes	☐ No
Stay clear of populous areas	☐ Yes	☐ No
Stay at least 30 m (100 ft) clear of people	☐ Yes	☐ No
Ensure you do not fly over people	☐ Yes	☐ No
Do not create a hazard to other aircraft, people or property › when flying › in the event your drone malfunctions › when dropping things	☐ Yes	☐ No
Keep clear of the following public safety operations › firefighting › law enforcement › emergency medical services › search and rescue	☐ Yes	☐ No
Operate within the manufacturer's meteorological and other limitations	☐ Yes	☐ No