National Drones RePL Study Guide

National Drones source material - web starter edition
Generated from the indexed web guide content.

Dedicated to my good mate Bob, who helped me get my start in aviation.
Ben Harris, Co-founder, National Drones

Regulatory baseline: Part 101 MOS F2024C00404 C10, checked 2026-05-18.
This guide supports study only and does not replace current CASA, Airservices or approved operator procedures.
The public practice questions are newly written study checks, not CASA-approved questions or a secure exam bank.

Included Units

RBAK - Basic Aviation Knowledge for RPAS
Scope: Part 101 MOS C10 Schedule 4, Unit 1, items 1-9.

RACP - Airspace, Charts and Aeronautical Publications for RPAS
Scope: Part 101 MOS C10 Schedule 4, Unit 2, items 1-5.

RBMO - Basic Meteorology for RPA Operations
Scope: Part 101 MOS C10 Schedule 4, Unit 3, items 1-3.

REES - Electrical and Electronic Systems for RPAS
Scope: Part 101 MOS C10 Schedule 4, Unit 4, items 1-9.

RHPF - Human Performance for RPAS
Scope: Part 101 MOS C10 Schedule 4, Unit 5, items 1-6.

RKOP - RPAS Knowledge - Operations and Procedures
Scope: Part 101 MOS C10 Schedule 4, Unit 6, items 1-10.

RORA - Operational Rules and Air Law for RPAS
Scope: Part 101 MOS C10 Schedule 4, Unit 7, items 1-2.

RAFM - Automated Flight Management Systems Knowledge
Scope: Part 101 MOS C10 Schedule 4, Unit 8, item 1.

RBKM - Aeronautical Knowledge and Operation Principles - Multirotor
Scope: Part 101 MOS C10 Schedule 4, Unit 10, items 1-10.

AROC - Aeronautical Radio Operator Certificate
Scope: Supplementary AROC and radio operations study material linked to RePL operations.

RBAK: Map Position, Latitude/Longitude and Runway Orientation
Status: current
Source: RePL Study Guide pp. 11-29; Part 101 MOS C10 pp. 92-95.
Use latitude, longitude, true and magnetic direction, runway numbers and clock-code references to describe where an RPA operation is happening.

A map turns the flight into a position problem

Before a remote pilot thinks about altitude, airspace or weather, they need to know exactly where the operation is. Aviation charts, approved apps and operator procedures all start with a position: the operating area, nearby aerodromes, controlled airspace, restricted areas, terrain and emergency landing options.
Latitude and longitude give that position a common language. They let a pilot, observer, chief remote pilot, air traffic service or emergency service talk about the same place without relying on local descriptions such as beside the shed or near the creek.
- Use coordinates to define the operating site and nearby hazards.
- Use current chart and app data to check what surrounds the site.
- Keep screenshots or records only where your operator procedures require them.

Latitude and longitude are the grid

Latitude lines run east-west across the chart, but they measure how far north or south a position is from the equator. In Australia, latitude is normally written south, such as 27 S.
Longitude lines run north-south across the chart, but they measure how far east or west a position is from the Greenwich meridian. In Australia, longitude is normally written east, such as 153 E.
The simple check is this: latitude tells you north/south position; longitude tells you east/west position. Do not swap them when copying coordinates into an app, flight plan or job note.
- Latitude first, longitude second is the normal aviation and mapping convention.
- South and east matter. A missing S or E can put a coordinate in the wrong hemisphere.
- Decimal degrees and degrees/minutes/seconds are different formats; convert carefully.

True north and magnetic north are not the same thing

Figure: True and magnetic north are separated by variation. Confirm whether the source direction is true or magnetic before using it operationally.
True north points to the geographic North Pole. Magnetic north points toward the earth’s magnetic field, and the angle between true north and magnetic north is called variation.
Charts and aviation procedures may use true or magnetic direction depending on the context. A runway number is based on magnetic direction. Some planning tools and maps may display true direction unless configured otherwise.
For RePL study, the important habit is not memorising a local variation. It is checking what reference the source is using, applying the conversion correctly and recording the direction in the same reference system as the procedure or chart.

Runway numbers are direction clues

Figure: Runway numbers approximate magnetic direction. Clock-code calls are relative to the aircraft nose, so 12 o'clock is ahead and 3 o'clock is to the right.

Runway numbers are shorthand for magnetic direction rounded to the nearest 10 degrees. A runway marked 04 is aligned roughly 040 magnetic. The opposite end is about 180 different, so it is marked 22.

Remote pilots are not using runway numbers to land an RPA unless authorised and trained for the operation. The value here is orientation. If a nearby aerodrome has runway 04/22, you can quickly picture likely approach and departure directions and brief observers more clearly.

That does not replace an airspace or aerodrome check. It simply gives the pilot another visual anchor when interpreting charts, NOTAMs, ERSA information or aerodrome procedures.

Clock code is relative, not geographic

Clock-code direction is useful when a pilot or observer needs to point out traffic quickly. It does not describe north, south, east or west. It describes where something sits relative to the aircraft nose or another briefed reference.

If an observer says traffic is at 2 o'clock, the pilot should understand it as ahead and to the right of the reference direction. For RPA work, agree the reference before the flight because the pilot, observer, controller screen and aircraft nose may not all face the same way.

Good crews avoid clever wording. If clock code could be ambiguous, add plain language: helicopter at 2 o'clock, high, moving left to right, north of the site.

- Use compass direction for fixed locations.
- Use clock code for quick relative traffic calls.
- Add altitude, movement and threat level when it helps the pilot decide.

Practice: A coordinate is written as 27 S 153 E. Which part is latitude?
Answer: 27 S, because latitude measures north or south of the equator.
Latitude is north/south position. Longitude is east/west position.

Practice: A runway marked 04 is approximately aligned with which magnetic direction?
Answer: 040
Runway numbers are rounded magnetic directions with the final zero removed.

Practice: An observer calls traffic at 3 o'clock. What does that normally mean?
Answer: Traffic is to the right of the aircraft nose or briefed reference.
Clock code is relative direction, not a compass bearing or distance.

Practice: Why should a remote pilot check whether a direction is true or magnetic?
Answer: Because variation can make true and magnetic directions different.
Variation is the angle between true north and magnetic north. The pilot must know which reference the chart, app or procedure is using.

RBAK: Direction, Heading and Wind
Status: current

Source: RePL Study Guide pp. 11-35; Part 101 MOS C10 pp. 92-93.
Learn how aviation expresses direction, why heading and track are different, and how wind changes the path an RPA actually flies.

Direction is a safety language
Figure: Use the compass picture first: every precise aviation direction is measured clockwise from north as a three figure group.
Aviation avoids casual direction words wherever precision matters. A bearing or heading is normally spoken as a three figure group measured clockwise from north. East is 090, south is 180, west is 270 and north is normally 360.
That format matters because remote pilots share airspace with crewed aircraft, and clear direction keeps observers, pilots and air traffic services talking about the same thing.
- Use leading zeros: say 045, not 45.
- Use clock code for traffic relative to the aircraft nose.
- Use cardinal and ordinal points only when approximate direction is enough.

Heading is not the same as track
Figure: Heading is where the nose points; track is the path over the ground. Wind is what separates the two.
Heading is where the aircraft nose points. Track is the path over the ground. Wind can push the aircraft sideways, so a drone may need to point slightly into wind to maintain the intended ground path.
A practical remote pilot watches both the planned track and what the aircraft is actually doing. The stronger the crosswind, the more obvious the difference becomes.

Wind is reported from where it comes
Figure: Wind velocity always combines direction and speed. In aviation, the direction is where the wind comes from.
A wind reported as 270/15 is coming from the west at 15 kt. For an RPA, that can mean more battery use into wind, faster groundspeed downwind and sideways drift in a crosswind.
Use forecasts for planning, then confirm conditions at the operating site. Gusts, turbulence around buildings and terrain effects can make the local wind less friendly than the forecast suggests.

Practice: A drone is pointed east, but a northerly wind pushes it south of the planned line. Which statement is correct?
Answer: The heading is east and the track is drifting south of east.
Heading is nose direction. Track is the actual ground path, which can be displaced by wind.

RBAK: Time, UTC and Date-Time Groups
Status: current
Source: RePL Study Guide pp. 32-34; Part 101 MOS C10 p. 92.
Use aviation time correctly by reading four, six and eight figure groups and converting Australian local time to and from UTC.

Aviation needs one shared clock

Figure: UTC gives every pilot the same clock. The picture makes the Australian offsets easier to keep straight.

Local civil time is useful on the ground, but aviation information needs a common reference. Weather, NOTAMs and operational coordination use Universal Coordinated Time, normally written as UTC.

A four figure group gives the hour and minutes on the 24 hour clock. For example, 0525 means 5:25 am UTC, while 1525 means 3:25 pm UTC.

Australian conversions need the date as well as the hour

Figure: A time conversion can cross midnight. When the date changes, write it down rather than trusting memory.

Eastern Standard Time is 10 hours ahead of UTC. To convert EST to UTC, subtract 10 hours. If that takes you before midnight, the UTC time is on the previous date.

The trap is assuming the date remains unchanged. A NOTAM or weather validity time near midnight can belong to yesterday or tomorrow in local time.

- Four figures usually mean hour and minute.
- Six figures usually mean day, hour and minute.
- Eight or ten figures can add month and year when the wider date context is needed.

Use date-time groups operationally

Remote pilots should be comfortable turning local job times into UTC for flight planning and reading UTC information back into local time for the crew.

When the operation depends on a NOTAM, forecast window or approval time, write the local and UTC interpretation in the job pack. That small habit prevents avoidable timing errors.

Practice: If it is 1525 EST, what is the UTC time?

Answer: 0525 UTC

Eastern Standard Time is UTC plus 10 hours, so subtract 10 hours to convert EST to UTC.

RBAK: Height, Altitude, Elevation and Aviation Units

Status: current

Source: RePL Study Guide pp. 29-35; Part 101 MOS C10 p. 92.

Separate height, altitude and elevation, then apply the units remote pilots meet in aviation weather, charts and operations.

The datum changes the meaning

Figure: The same vertical position can be described differently depending on the datum: ground, launch point or mean sea level.

Height is vertical distance above a specified datum, usually the ground directly below the aircraft. Altitude is measured above mean sea level. Elevation is the height of a fixed point, such as an aerodrome or hill, above mean sea level.

A drone display often shows height relative to the launch point. A crewed aircraft altimeter normally references mean sea level when set to QNH. That difference can create a dangerous misunderstanding near aerodromes or terrain.

Think in both AGL and AMSL

Figure: Crewed aircraft altimeters and RPA relative-height displays can be talking about different vertical references.

If a drone is 400 ft above a site that is 1500 ft AMSL, the aircraft is about 1900 ft AMSL. A crewed aircraft reporting 2000 ft near the same site may be much closer than a new remote pilot expects.

The remote pilot should know the elevation of the operating site and understand whether the aircraft display is showing relative height, terrain-following height or another estimate.

Use the right unit for the context

Figure: Unit discipline keeps planning consistent when charts, weather, aircraft manuals and apps use different units.

Australian aviation commonly uses nautical miles for navigation distance, feet for altitude and elevation, knots for wind and aircraft speed, metres or kilometres for visibility, Celsius for temperature, hectopascals for pressure and kilograms for weight. RPA manuals may also use metres per second, kilometres per hour, pounds or Fahrenheit. Conversions are not academic; they are part of checking limits before flight.

- 1 nautical mile is 1.852 km.
- 1 knot is 1 nautical mile per hour.
- Kilograms to pounds is approximately kg x 2.2.
- Standard sea level pressure is 1013.2 hPa.

Practice: A drone is 400 ft above a launch site with an elevation of 1500 ft AMSL. What is its approximate altitude AMSL?

Answer: 1900 ft

Add the drone height above ground to the site elevation: 1500 ft + 400 ft = 1900 ft AMSL.

RBAK: Aircraft Energy, Inertia and Speed

Status: current

Source: RePL Study Guide pp. 199-200; Part 101 MOS C10 p. 92.

Understand potential energy, kinetic energy and inertia so aircraft behaviour, wind effects and stopping margin make practical sense.

Energy is the aircraft’s work budget

Figure: The three ideas fit together: height stores energy, speed carries energy, and inertia resists a sudden change.

A drone is always managing energy. Battery power turns the propellers, the propellers create thrust, thrust creates movement, and movement gives the aircraft momentum. For study, the MOS keeps this topic simple: know potential energy, kinetic energy and inertia. For flying, the useful habit is even simpler: more height, more speed or more mass means the aircraft needs more respect and more margin.

Potential energy is height

Potential energy is stored by position. In this lesson, that mainly means height above the ground. A drone at 120 m AGL has more stored energy than the same drone at 20 m AGL because gravity has more room to accelerate it during an uncontrolled descent.

That does not mean height is automatically unsafe. Height can also provide obstacle clearance and time to respond. The point is to plan it deliberately: choose a return-to-home height, climb and descent path, and emergency landing area that match the site.

- More height can give more time to think, but also more energy to manage.
- A descent is an energy change: stored height is being traded for movement and rotor work.
- Return-to-home height should clear obstacles without creating unnecessary exposure.

Kinetic energy is motion

Figure: Speed, distance and time are tied together. Faster groundspeed means less thinking time and more distance covered before the aircraft stops or turns.

Kinetic energy is the energy of motion. A moving aircraft cannot stop instantly because the propellers, flight controller and air resistance need time and distance to change what the aircraft is doing.

Speed matters twice in practice. It reduces the time you have to recognise a problem, and it increases the distance the aircraft will travel while it is slowing, turning or correcting after a gust.

Inertia is why decisions need margin

Inertia is the tendency of an object to keep doing what it is already doing. If the drone is moving forward, it tends to keep moving forward. If it is descending, it tends to keep descending until enough upward force changes that trend.

This is why good remote pilots make early, smooth corrections. Waiting until the aircraft is close to a tree, building, bystander or boundary leaves the flight controller with less room to turn pilot intent into aircraft movement.

- A heavier aircraft has more inertia than a lighter aircraft at the same speed.
- A faster aircraft has more kinetic energy than a slower aircraft of the same mass.
- A payload can increase mass, change balance and make the aircraft feel less eager to stop or climb.

Wind changes the energy story

The aircraft flies in moving air, but the pilot often judges the mission over the ground. Into wind, a drone may need more power to make the same ground progress. Downwind, the same aircraft can cover ground faster than expected.

That difference matters near people, obstacles and operational boundaries. A downwind leg can eat up distance quickly; an into-wind return can eat up battery. Energy management and wind awareness belong together.

- Plan the return leg with wind in mind, not just the outbound leg.
- Leave more stopping and turning room when groundspeed is high.
- Treat gusts as energy changes: the aircraft may suddenly speed up, slow down, climb, sink or drift.

What this means for remote pilots
The practical lesson is not to do physics in your head during every flight. It is to recognise when the aircraft has more energy than usual and adjust the plan before that matters.
High speed, extra payload, high return-to-home settings, steep descents, strong wind and tight operating areas all deserve earlier decisions and bigger margins.
- Slow down before entering a confined area.
- Start descent planning early instead of dropping steeply at the end.
- Keep enough battery reserve for the into-wind return.
- Give heavier or payload-carrying RPA more room to stop, climb and turn.

Practice: Which statement best describes kinetic energy?
Answer: Energy associated with motion.
Kinetic energy increases with motion and is an important part of aircraft performance and impact risk.

Practice: A drone is returning downwind toward the pilot faster than expected. What is the best energy-management response?
Answer: Reduce speed early and allow more stopping distance.
Downwind groundspeed can build quickly. Early speed control gives the aircraft more room and time to slow or turn safely.

Practice: Why can a payload-carrying RPA need more margin than the same aircraft without payload?
Answer: More mass can increase inertia and affect stopping, climb and handling.
Additional mass means the aircraft may resist changes in motion more strongly, so the pilot should allow more operating margin.

RBAK: Aerodynamics, Weight and Balance
Status: current
Source: RePL Study Guide pp. 199-206; Part 101 MOS C10 pp. 92-93.
Connect aerofoil terminology, forces, centre of gravity and loading limits to safe RPA operation.

Four forces, one aircraft
Figure: Put the four forces on the aircraft first, then the words lift, weight, thrust and drag become concrete.
Lift acts upward, weight acts downward, thrust moves the aircraft forward or upward depending on the design, and drag resists motion through the air.
Angle of attack is the angle between the aerofoil chord line and the relative airflow.
Centre of pressure is where the aerodynamic force acts. Centre of gravity is where the aircraft balances.

Lift has more than one explanation
Figure: The lift explanation is not just formula work. It is a picture of air being

shaped, accelerated and deflected.

The MOS expects remote pilots to understand Bernoulli, Coanda and Newton’s third law at a basic level. In practical terms, an aerofoil or rotor creates lift by shaping and accelerating air so that a useful force is produced.

The exam point is useful, but the operational point is better: damaged propellers, wrong payloads, high density altitude or poor loading can reduce the lift and control margin you thought you had.

Loading changes the aircraft

Figure: A payload is not just extra weight. Where that weight sits changes the balance of the whole aircraft.

Empty weight, operating weight, maximum gross weight, arm, moment, datum and centre of gravity limits are all ways of describing whether the aircraft is loaded within its approved envelope.

For RPA operations, payloads are the everyday trap. A camera, sprayer tank, LiDAR unit or extra battery can change gross weight, balance, endurance and emergency handling.

Practice: Why can adding a payload change flight safety?

Answer: It can change weight, balance, endurance and control margin.

Payload affects aircraft loading and can push the RPA outside expected performance or balance limits.

RBAK: Lift, Drag and Angle of Attack

Status: current

Source: RePL Study Guide pp. 200-213; Part 101 MOS C10 p. 93.

See how changes in airspeed and angle of attack affect lift, drag, stall margin and endurance.

Lift changes with speed and angle

Figure: Angle of attack is easier to remember when it is seen against the relative airflow, not as a definition in isolation.

Increasing airspeed or angle of attack can increase lift up to a point. Beyond the useful range, airflow can separate and lift can reduce sharply.

For fixed-wing RPA, that point is tied to stall awareness. For multirotors, the same general idea still helps explain rotor loading, translational lift and why disturbed airflow matters.

Drag is not one thing

Figure: This is the thousand-word picture for drag: slow flight and fast flight waste energy for different reasons.

Parasite drag includes form drag, interference drag and skin friction. Induced drag is associated with producing lift. Different types dominate at different speeds.

The practical lesson is that flying too fast or too slow can both waste energy. Mission planning should account for the aircraft’s efficient operating speed, wind and payload.

Endurance comes from balance

Maximum endurance is not simply maximum speed or minimum speed. It is the point where the aircraft can stay airborne longest for the available energy.
Remote pilots see this as battery margin. Wind, climb, turns, payload and poor route design all move the operation away from the ideal.

Practice: Which type of drag is associated with producing lift?
Answer: Induced drag
Induced drag is lift dependent and is one of the drag types remote pilots should recognise.

RBAK: Propellers, Rotors, Thrust and Torque
Status: current
Source: RePL Study Guide pp. 166-172; Part 101 MOS C10 p. 93.
Understand blade angle, pitch, thrust, torque and why propeller or rotor condition matters before launch.

A propeller is a rotating wing
Figure: A propeller is easier to understand as a rotating aerofoil: blade angle and pitch decide how it bites the air.
Propellers and rotor blades create thrust by accelerating air. Blade angle, helix angle and pitch describe how the blade meets the air as it rotates.
A damaged, incorrectly installed or mismatched propeller can reduce lift, increase vibration, increase current draw and compromise control.

Torque has to be managed
Figure: Opposing propeller directions are part of the control system. A wrong prop can turn a normal launch into an immediate control problem.
When a motor turns a propeller or rotor one way, an opposite torque reaction acts on the aircraft. Multirotors manage this with opposing rotor directions and flight controller mixing.
That is why propeller position and direction matter. A propeller fitted to the wrong arm or upside down may still spin, but it will not produce the expected thrust.

Pre-flight checks are aerodynamic checks
Checking propellers is not just a mechanical habit. It verifies the aircraft still has the aerodynamic surfaces it needs to generate predictable thrust.
Look for cracks, chips, deformation, loose mounts, wrong prop type and contamination before flight.

Practice: Why is an incorrectly installed multirotor propeller dangerous?
Answer: It may not produce the expected thrust or torque balance.
Propeller direction, pitch and position are critical to thrust and aircraft control.

RBAK: Flight Controls, Axes and Climb
Status: current
Source: RePL Study Guide pp. 188-198 and 220-224; Part 101 MOS C10 p. 93.

Relate pitch, roll, yaw, power, climb angle and control inputs to what the aircraft actually does.

Every movement is around an axis
Figure: Pitch, roll and yaw become much simpler once the three aircraft axes are visible.
Pitch is movement around the lateral axis, roll is movement around the longitudinal axis and yaw is movement around the vertical axis.
Remote pilots do not need to become aerodynamic engineers, but they do need to connect stick input, aircraft attitude, power and flight path.

Power changes vertical and horizontal performance
Figure: Climb, groundspeed and time are linked. The diagram helps turn performance language into planning arithmetic.
Increasing power may increase climb, speed or both depending on the aircraft type and attitude. Reducing power may increase descent or reduce speed.
Angle of climb describes steepness over the ground. Rate of climb describes vertical speed. Wind can change the angle over the ground without changing the aircraft’s actual vertical performance.

Skid, slip and trim are control quality topics
Skid and slip describe unbalanced flight. Trim controls reduce the force or input needed to hold an attitude. Even when automation hides these effects, the pilot should recognise poor control behaviour.

Practice: Which axis is associated with yaw?
Answer: Vertical axis
Yaw is rotation left or right around the aircraft’s vertical axis.

RBAK: Remote Pilot Station and Control Link
Status: current
Source: RePL Study Guide pp. 175-183; Part 101 MOS C10 p. 93.
Identify the remote pilot station features that support control, telemetry, software, antennas and non-payload communications.

The remote pilot station is part of the aircraft system
Figure: The remote pilot station is part of the aircraft system, not just something held in the pilot’s hands.
The transmitter, command and control link, flight controls, antennas, software, telemetry and power supply form the working connection between the remote pilot and aircraft.
A weak tablet battery, wrong firmware, damaged antenna or poor controller setup can become an aircraft problem in flight.

Telemetry is decision support
Figure: Telemetry is useful because it closes the loop between what the aircraft is

doing and what the pilot thinks it is doing.
Telemetry gives the pilot information such as battery state, aircraft position, height, link quality, warnings and mode status. It should be monitored, not merely displayed.
If telemetry disagrees with visual observation or expected aircraft behaviour, slow the operation down and diagnose before continuing.

Software changes are operational changes
Firmware, app versions and control settings can alter aircraft behaviour. Update discipline, configuration checks and test flights help prevent surprises on operational jobs.

Practice: Which item is part of remote pilot station knowledge?
Answer: Command and control link.
The MOS includes transmitter, command and control link, controls, antennas, software, telemetry and power supply.

RBAK: Performance, Wind Shear, Turns and Ground Effect
Status: current
Source: RePL Study Guide pp. 215-236; Part 101 MOS C10 pp. 92-95; CASA AC 101-01 v6.1 and AC 101-03 v2.0 checked 2026-05-19.
Preserve performance margin when weight, wind, heat, height, turns and descent airflow make the aircraft work harder.

Performance margin is the room left over
Figure: Weight, wind, heat and altitude all push into the same limited performance margin.
Performance margin is what remains after the aircraft has dealt with weight, payload, wind, temperature, altitude, climb demand, turns and the distance back to a safe landing area.
A remote pilot should not think of performance as a single maximum flight time number. Performance is a moving margin. It shrinks when the aircraft has to work harder and grows when the pilot simplifies the job.

Weight and density effects change climb and recovery
More weight means more thrust is needed to hover, climb, stop a descent and turn. Hotter air and higher elevation can reduce available performance. Add wind, payload and battery sag, and a flight that looked ordinary can become marginal.
For multirotor work, the practical check is simple: if the aircraft climbs slowly, fights the wind, sounds loaded, runs hot or uses battery faster than expected, reduce task complexity and recover early.
- Be conservative with heavy payloads, high temperatures and long return legs.
- Treat poor climb after launch as useful warning information.
- Keep reserve for the return, not just for hovering over the target.

Wind shear and gusts change the aircraft’s energy picture
Figure: When wind changes quickly, the pilot needs more space, more battery margin and

simpler manoeuvres.
Wind shear is a change in wind speed or direction over a short distance or height. Gusts, buildings, terrain, tree lines and thermal activity can all change drift, stopping distance, climb demand and battery use.
The risk for a remote pilot is being surprised late: a downwind leg carries the aircraft away, an into-wind return uses more battery, or a low-level gust reduces margin near obstacles.

Turns increase demand

Figure: As turns become tighter or steeper, performance margin reduces and workload rises.
A turn changes the lift and thrust picture. The tighter, faster or steeper the turn, the more the aircraft has to work to maintain control and altitude. Wind and payload can make that demand more obvious.
For RePL study, the takeaway is practical: avoid tight, rushed turns when the aircraft is heavy, close to obstacles, low on battery, downwind or already showing reduced performance.

Stall and spin awareness is about recognising loss of margin

For fixed-wing RPA, angle of attack, stall and spin awareness remain important. For multirotor pilots, the same safety habit applies even though the aerodynamics are different: recognise when control margin is disappearing and avoid forcing the aircraft into a corner.
A slow response, high sink rate, heavy payload, turbulent approach, tight turn or poor climb is not something to push through casually. It is a reason to simplify and recover.

Ground effect can help briefly, but it can also hide poor planning

Figure: Ground effect is not a rescue plan. The pilot still needs a controlled descent and recovery margin.
Near the surface, rotor airflow interacts with the ground. This can create a cushioning effect that makes the aircraft feel more efficient close to the landing area, but the benefit fades with height and does not remove obstacle, wind or descent risks.
A rushed descent can still put the aircraft into disturbed airflow, close to people, obstacles or rough terrain. Plan the descent early instead of arriving low, fast and short of options.

The practical decision is to make the job easier

When performance margin is shrinking, the best response is usually not more aggressive flying. It is a simpler task, wider turns, earlier landing, lower workload, better launch point, smaller payload, shorter route or a postponed flight.
A performance problem is easier to solve while the aircraft is still close, high enough, controllable and carrying enough battery to come home.

Practice: What is performance margin in practical RPA operations?
Answer: The spare capability left after weight, wind, heat, altitude, battery and task demand are considered.

Performance margin changes with aircraft loading, environment, battery state and the way the task is flown.

Practice: What should a slow climb or unexpectedly high battery use after launch suggest?
Answer: The aircraft may have less performance margin than planned, so the task should be simplified or recovered early.
Early performance cues are useful warning information and should not be ignored.

Practice: Why can wind shear or gusts increase risk near obstacles?
Answer: They can change drift, stopping distance, climb demand and battery use quickly.
Changing wind can reduce the time and space available for correction.

Practice: What is the safer response when performance margin is shrinking?
Answer: Simplify the task, widen turns, preserve battery and recover early.
Conservative decisions preserve options while the aircraft is still controllable.

RACP: Airspace, Charts and Approvals
Status: current
Source: RePL Study Guide pp. 40-99; Part 101 MOS C10 pp. 94-95.
Read the aeronautical picture before launch: airspace, aerodromes, PRD areas, NOTAMs and approval pathways.

Start with the airspace question
Figure: Work from the location outward: chart, airspace, aerodrome, PRD area, NOTAM and approval path.
Before a remote pilot thinks about launch points, batteries or camera settings, the airspace needs to make sense. Identify whether the job is in Class G, near controlled airspace, near a controlled or non-controlled aerodrome, or inside a prohibited, restricted or danger area.
Charts are not decoration. They show aerodromes, control zones, control areas, VFR routes, CTAF boundaries, radio frequency boundaries and special-use areas that can change the operational decision.

Use official information, then cross-check it
The core sources are aeronautical information publications, ERSA and NOTAMs. A CASA verified drone safety app can help field decision-making, but it should not replace understanding the underlying aviation information.
For restricted areas, controlled airspace, operations near aerodromes or operations above 400 ft AGL, the pilot must identify whether a permission, approval or exemption is required before the operation is flown.
- Check the location against the applicable chart.
- Check NOTAMs for temporary hazards or restrictions.
- Check ERSA or relevant publications for aerodrome and frequency information.
- Record the decision path in the job pack when the operation is commercial.

Know when approval or radio qualification enters the picture

Some operations need more than a map check. Controlled airspace, controlled aerodrome no-fly zones, restricted areas, operations above 400 ft AGL, and some aerodrome-adjacent operations can require approval, permission, coordination or an aeronautical radio qualification.

The safe habit is to separate three questions: where is the aircraft, what rule or published information applies there, and what authorisation or communication is required before launch.

- Do not treat a green app result as the whole approval story.
- Check whether the operator has the right approval as well as whether the pilot has the right licence.
- Record radio frequencies, CTAF context and aerodrome considerations in the job pack where relevant.

PRD areas and NOTAMs can change the day

Prohibited, restricted and danger areas are not background chart clutter. They can represent military activity, hazardous operations, special events or other airspace activity that changes whether an RPA job can proceed.

NOTAMs are the temporary layer. They can introduce hazards, restrictions, aerodrome changes, airspace activation, navigation changes or operational information that was not present when the original job was planned.

EFBs are useful, not magic

Electronic flight bags and drone safety apps reduce workload, but they can also hide assumptions. Battery, data coverage, stale downloads or a wrong operating profile can all turn a convenient tool into a weak link.

The safe habit is simple: use digital tools, know what source they are using, and carry enough understanding to challenge an answer that does not look right.

- Check the app profile: aircraft type, operation type, height, date and location.
- Check data currency before relying on cached information.
- If the digital answer conflicts with official source material, stop and resolve the conflict.

A clean decision is traceable

Figure: The useful output is a decision the crew can trace: go, modify, delay, coordinate or do not launch.

The goal is not to collect screenshots. The goal is a traceable decision: the crew can explain why the operation was legal, controlled and inside the operator’s procedures at the time it was flown.

For commercial work, that decision trail belongs in the job pack. It protects the crew, helps the chief remote pilot review the operation, and makes repeat work easier to brief.

Practice: Which source should be checked for temporary operational changes that may affect a planned RPA operation?

Answer: NOTAMs

NOTAMs communicate temporary changes and hazards relevant to aviation operations.

Practice: A drone safety app gives a simple result, but the chart shows nearby controlled airspace and the job is close to an aerodrome. What should the pilot do?
Answer: Cross-check official sources and confirm whether approval, coordination or radio requirements apply.
Digital tools help decision-making, but the pilot still needs to understand official aeronautical information and approval requirements.

Practice: Why should an airspace decision be recorded in a commercial job pack?
Answer: It creates a traceable decision path for legal, operational and review purposes.
A clear decision record helps the crew and operator show how the operation was assessed before flight.

RACP: Airspace Classes, Controlled Aerodromes and CTAF
Status: current
Source: RePL Study Guide pp. 66-82 and 92-98; Part 101 MOS C10 pp. 94-95; CASA flight approvals and permissions guidance checked 2026-05-18.
Build the airspace picture around class, aerodrome type, controlled airspace, CTAF, VLOS, altitude and approval triggers.

Airspace class describes the traffic environment
Figure: Airspace is three-dimensional. A site can look open on the ground while controlled airspace, aerodrome procedures or special-use areas sit above or nearby.
Airspace class is the first clue to what kind of aviation environment surrounds the operating site. Controlled airspace is managed by air traffic services. Non-controlled airspace still has rules, traffic patterns, radio frequencies and other aircraft.
For RPA planning, the point is not to memorise every service detail from crewed aviation. The point is to recognise when the operation has moved from a simple open-area job into an airspace decision that needs a chart, current publication, approval check or radio consideration.
- Class A is high-level controlled airspace and is not a normal RPA operating environment.
- Class C and Class D commonly matter around controlled aerodromes and control zones.
- Class E can sit above lower-level airspace and still affect the wider airspace picture.
- Class G is non-controlled airspace, not rule-free airspace.

Controlled aerodromes change the approval question
Figure: Controlled and non-controlled aerodromes create different checks, but both need a clear traffic and authority trigger before launch.
A controlled aerodrome generally has an operating air traffic control tower. Around those aerodromes, RPA operations may be affected by control zones, approach and departure paths, movement areas, height limits, airspace authorisations and operator-specific approvals.
CASA’s current public guidance identifies several situations that require authorisation,

including operations above 120 m or 400 ft AGL, operations within 5.5 km or 3 NM of a controlled aerodrome, operations over a controlled aerodrome movement area, and operations in the approach or departure path of a controlled aerodrome.

That wording must be checked against the current CASA page and any operator approval before flight. In the study guide, the durable lesson is the decision habit: do not treat controlled aerodrome proximity as just another map symbol.

- Identify whether the aerodrome is controlled and whether the tower is operating.
- Check the control zone, approach/departure paths and movement area.
- Confirm whether the ReOC, chief remote pilot and individual remote pilot have the required approval pathway.
- Record the decision source, date, time and any approval reference in the job pack.

CTAF does not mean casual

A non-controlled aerodrome is normally in Class G airspace. It may use a Common Traffic Advisory Frequency so aircraft can broadcast position and intentions. That environment can still be busy, especially near circuit areas, training operations, agricultural operations and helicopter activity.

For remote pilots, CTAF awareness is about building a traffic picture. If the operation requires radio communication, the crew must have the right qualification and equipment. If it does not, the pilot still needs a practical method to maintain separation, keep VLOS and respond to crewed aircraft.

- Know the aerodrome location, runways and circuit direction where published.
- Know the frequency and whether the crew will monitor or transmit.
- Brief observers on approach/departure paths and likely circuit traffic.
- Land or hold clear early if crewed aircraft activity creates uncertainty.

VLOS and altitude do not replace the airspace check

Staying under 400 ft AGL and maintaining visual line of sight are core RPA habits, but they do not automatically make every location available. Aerodrome proximity, controlled airspace, restricted areas, danger areas, temporary NOTAM activity and operator approvals still matter.

A useful planning sentence is: where is the RPA in three dimensions, what published aviation information applies there today, and what authorisation or communication is required before launch?

The practical output is a go/no-go airspace decision

A good airspace check produces a decision the crew can explain. It says what airspace was checked, what aerodromes or PRD areas were nearby, what NOTAMs mattered, what approval pathway applied, and what operational limits were briefed.

If the answer depends on a current source, include the source. If the answer depends on an approval, include the approval. If the answer depends on radio, include the frequency and qualification assumption.

Practice: What is the safest first question when planning an RPA operation near an aerodrome?

Answer: What airspace, aerodrome and published procedure context applies to the site?

Airspace and aerodrome context can determine whether approval, coordination, radio or revised operating limits are required.

Practice: Which statement about Class G airspace is correct for RePL study?
Answer: Class G is non-controlled airspace, but normal aviation and RPA rules still apply.
Non-controlled does not mean unregulated. The remote pilot must still consider traffic, aerodromes, altitude, VLOS and other rules.

Practice: Why does CTAF awareness matter to a remote pilot?
Answer: It helps the crew understand and manage nearby traffic at non-controlled aerodromes.
CTAF supports traffic awareness. The crew still needs correct qualifications, equipment and operating procedures if radio communication is required.

Practice: A site is under 400 ft AGL and VLOS can be maintained. What still needs checking?
Answer: Airspace, aerodrome proximity, PRD areas, NOTAMs and approval requirements.
Altitude and VLOS are necessary controls, but they do not replace the wider airspace and publication check.

RACP: ERSA, NOTAMs, PRD Areas and Publication Checks
Status: current
Source: RePL Study Guide pp. 83-98; Part 101 MOS C10 pp. 94-95; Airservices AIP/ERSA/NOTAM sources checked 2026-05-18.
Turn charts, ERSA, NOTAMs, PRD areas and drone safety apps into a traceable pre-flight decision.

Charts show structure; ERSA gives aerodrome facts
Figure: The chart asks where the operation sits. ERSA, NOTAMs and PRD checks explain what that location means today.
A chart can show that an aerodrome, control zone, restricted area or frequency boundary exists. ERSA gives the deeper aerodrome information a pilot may need to interpret that picture, such as runway data, aerodrome remarks, communication frequencies, lighting, procedures and cautions where published.
A remote pilot does not need to use ERSA like an airline crew briefing package. They do need to know when an aerodrome detail could affect the RPA operation: runway direction, circuit activity, CTAF, approach/departure paths, emergency options, hazards and operating hours.

NOTAMs are the temporary layer
Figure: A NOTAM or PRD check is only useful when the crew tests time, place, height and activity status together.
NOTAMs communicate temporary aeronautical information. For an RPA operation, a NOTAM may indicate temporary restricted airspace, an activated danger area, aerodrome works, runway or lighting changes, frequency changes, emergency activity, special events or

other hazards.

The important habit is date and location discipline. A NOTAM that mattered yesterday may not matter today, and a NOTAM at the wrong aerodrome is just noise. Check the current pre-flight information for the time, location, altitude and route of the planned job.

- Check NOTAMs close enough to flight time to catch temporary changes.
- Read validity times, affected area and altitude limits carefully.
- Record only the NOTAMs that affect the decision or operating limits.

PRD areas are not chart decoration

Prohibited, restricted and danger areas exist because particular activity or risk may be present. Military activity, weapons ranges, special events, emergency operations and other hazards can all appear through special-use airspace.

A restricted area may be active or inactive depending on published times, NOTAMs or controlling authority information. A danger area is not automatically forbidden, but it tells the pilot there may be activity that makes the airspace unsuitable without further assessment.

- Identify the PRD designator and vertical limits.
- Check whether the area is active for the planned time.
- Check whether approval, clearance, coordination or avoidance is required.
- If the status is unclear, do not guess.

Drone safety apps are aids, not the whole briefing

CASA-verified drone safety apps help pilots understand where they can and cannot fly under CASA’s drone safety rules. CASA also describes them as guidance tools, not tools for air navigation.

For commercial work, an app result should be part of the evidence chain rather than the entire chain. The pilot should still understand the chart, aerodrome context, current NOTAMs, approval pathway and operator procedures.

- Check that the app profile matches the operation: aircraft, height, date, location and operator context.
- Check data currency and offline/cached status.
- Use official sources to resolve conflicts before launch.

Make the publication check traceable

A traceable publication check is short and specific. It records the current chart or app view, ERSA or aerodrome source where relevant, NOTAM result, PRD status, approval decision and any operating limits briefed to the crew.

This is not paperwork for its own sake. It prevents the same job from being re-argued every time, lets the chief remote pilot review the operation, and gives the crew a clear basis for stopping if the conditions change.

Practice: What is ERSA mainly used for in this RACP context?

Answer: Aerodrome and facility information that helps interpret nearby aviation activity.

ERSA provides aerodrome and facility information. It complements charts, NOTAMs and operator procedures.

Practice: Why are NOTAMs checked close to flight time?
Answer: They may contain temporary changes that were not present when the job was planned.
NOTAMs are a temporary information layer and can affect the go/no-go decision.

Practice: What should a remote pilot do if a PRD area's status is unclear?
Answer: Stop and resolve the status before relying on the airspace being available.
Special-use airspace must be understood before flight. If the status is unclear, the safe decision is to resolve it or avoid the area.

Practice: What is the safest way to use a CASA-verified drone safety app?
Answer: Use it as one source in a broader check that includes official information and operator procedures.
CASA-verified apps are useful guidance tools, but the remote pilot still needs a complete, current and traceable decision path.

RACP: Circuit Patterns, Aerodrome Traffic and CTAF Awareness
Status: current
Source: RePL Study Guide pp. 92-98 and 278-313; Part 101 MOS C10 Schedule 4 Unit 2.
Picture aerodrome traffic before launch: circuit legs, approach and departure paths, CTAF awareness, ERSA cues and practical RPA stop triggers.

The circuit is a mental traffic map
Figure: Circuit legs turn runway information into a picture: upwind, crosswind, downwind, base and final.
A circuit is the normal traffic pattern aircraft use around an aerodrome for take-off, landing and sequencing. A remote pilot does not need to fly that pattern, but they do need to picture it before operating nearby.
The practical question is simple: could a crewed aircraft be climbing, descending, joining, turning or tracking near the RPA site while the drone is airborne?
- Final and departure paths are high-priority conflict areas.
- Downwind, base and crosswind legs help explain where training traffic may appear.
- Circuit direction, runway in use and local procedures must be checked from current sources.

Runway direction helps you picture traffic
Runway numbers are magnetic orientation cues. A runway marked 18/36 points roughly north-south; 09/27 points roughly east-west. That lets the crew visualise likely approach and departure directions before aircraft are seen or heard.
Runway orientation is not permission to operate. It is a situational-awareness tool that helps the remote pilot brief observers, set boundaries and recognise when the planned area may sit under a traffic path.
- Ask which runway is likely in use based on wind and published information.
- Brief observers on where aircraft may appear first.
- Consider helicopters and non-standard joins, not just fixed-wing circuit traffic.

- Treat uncertainty about traffic flow as a reason to pause, not as a reason to launch.

The worksite may be outside the fence but inside the traffic picture

Figure: The important question is conflict potential, not just whether the RPA is inside a neat circle on a map.

An RPA job does not need to be on an aerodrome to affect aerodrome traffic. Approach paths, departure paths, circuit legs, helicopter routes, training areas and local transit paths can all extend beyond the aerodrome boundary.

This is where map distance can mislead. A site can be outside a simple radius but still close to a real traffic path, especially near runway extended centreline, circuit area, low-level helicopter activity or published cautions.

- Do not operate in a way that creates a collision hazard with aircraft.
- Land or hold clear early if a crewed aircraft path becomes uncertain.
- Use observers where the pilot cannot maintain a reliable traffic picture alone.

ERSA, CTAF and chart notes turn symbols into action

Figure: A useful aerodrome check links the chart, ERSA, CTAF, runway/circuit picture and final go, modify or stop decision.

ERSA can provide aerodrome facts that matter to an RPA crew: runway directions, frequencies, remarks, cautions, operating hours, lighting, procedures and local notes. Charts show the structure; ERSA and NOTAMs explain the operational details.

CTAF awareness is about shared traffic awareness at non-controlled aerodromes. If the operation requires radio communication, the crew needs the correct qualification and equipment. Even where transmitting is not required, the remote pilot still needs a plan for hearing, seeing and responding to traffic.

- Check current aerodrome information and NOTAMs close to flight time.
- Confirm the CTAF or frequency context from current sources, not memory.
- Brief radio assumptions clearly: monitor only, transmit, or no radio required under the approved procedure.
- Do not publish or use example calls operationally until reviewed by an aviation SME.

Controlled and non-controlled aerodromes are different problems

Near controlled aerodromes, the key question is authorisation and controlled-airspace interaction. Around non-controlled aerodromes, the key question is often traffic awareness, circuit conflict and whether the drone operation must give way, land, coordinate or stay clear.

CASA guidance, operator approvals and current aeronautical information must decide the exact pathway. For study, the durable habit is to recognise the trigger early and stop pretending an aerodrome-adjacent job is just a normal paddock job.

- Controlled aerodrome: check approval, airspace, movement area and approach/departure path restrictions.
- Non-controlled aerodrome: check circuit, CTAF, traffic, runway direction and published cautions.
- Any aerodrome: check NOTAMs and current operator procedures before launch.

Set clear traffic triggers before launch

A remote pilot should not wait until a crewed aircraft is close before deciding what to do. The crew brief should include triggers that produce a simple response: hold, land, remain below a lower height, move inside a tighter boundary, or do not launch.
This is study guidance, not legal advice. Verify current CASA rules, Airservices information, ERSA, NOTAMs, operator approvals and aviation reviewer advice before using any aerodrome-adjacent procedure.

- Aircraft heard or seen joining circuit: hold or land according to the brief.
- Aircraft on final or departure path near the worksite: land or remain clear early.
- Traffic picture uncertain: pause and resolve before launch or continue only if the procedure allows it.
- Radio or observer workload too high: simplify the task or stop.

Practice: Why should a remote pilot understand the circuit pattern near an aerodrome?
Answer: It helps the crew picture likely crewed-aircraft paths before launch.
Circuit awareness helps the RPA crew anticipate where aircraft may climb, descend, join or turn.

Practice: A worksite is outside the aerodrome fence but near the runway extended centreline. What is the key concern?
Answer: Crewed aircraft may be using the approach or departure path near the RPA site.
Conflict awareness depends on real traffic paths, not only the physical aerodrome boundary.

Practice: What is the safest way to use CTAF information in an RPA plan?
Answer: Check the current frequency/procedure and brief how the crew will monitor, transmit or otherwise manage traffic awareness.
CTAF supports shared traffic awareness, but the crew must use current information and the correct qualifications/procedure.

Practice: Which condition should trigger a hold, landing or reassessment near an aerodrome?
Answer: The crew is uncertain where nearby traffic is or what runway/circuit activity is occurring.
Uncertainty about crewed-aircraft traffic is a safety trigger. The pilot should pause, land or resolve the traffic picture.

RBMO: Weather Risk for Drone Operations
Status: current
Source: RePL Study Guide pp. 107-140; Part 101 MOS C10 p. 96.
A practical guide to reading weather as operational risk: wind, visibility, turbulence, temperature, rain, humidity and thunderstorms.

Weather is a flight decision
For RPA operations, weather is not background information. It affects control margin, battery endurance, visibility, navigation confidence, payload performance and crew workload.

A good weather decision starts before the aircraft is powered on. The remote pilot asks: can I keep the aircraft under control, keep it in sight, keep separation from people and obstacles, and still have enough reserve to recover safely if the conditions change?

Start with the big weather picture

Figure: Read the map as a risk picture: pressure patterns and isobar spacing help explain wind, cloud and changing weather.

Weather maps and forecasts help you understand why the local conditions are doing what they are doing. Pressure systems, troughs, ridges and fronts can all point to wind, cloud, rain, turbulence or storms before they arrive at the job site.

For RePL study, you do not need to become a meteorologist. You do need to recognise the common symbols and connect them to operational risk: closely spaced isobars usually mean stronger wind, lows and troughs can bring unsettled weather, and fronts often bring changes in wind, cloud and rain.

Wind deserves more than one number

Figure: Local terrain and buildings can make the air less friendly than the forecast suggests.

A forecast wind can be useful, but the operating site may tell a different story.

Measure or observe wind at the launch point, near obstacles and along the likely flight path. The mean wind is only the starting point.

Strong wind can reduce endurance, increase drift and make precision work harder. Gusts matter because the aircraft is constantly being asked to correct. Windshear and wind gradient matter because wind can change sharply with height or position.

- Headwind can slow the return and increase battery use.
- Tailwind can make the aircraft cover ground faster than expected.
- Crosswind creates drift and may reduce the precision of inspection or mapping runs.
- Mechanical turbulence can form downwind of buildings, trees, ridgelines and other obstructions.

Visibility and cloud protect VLOS

Figure: Visibility is not just a number on a forecast. Slant visibility can be worse than the view along the ground.

Remote pilots rely on sight. Poor visibility, low cloud, fog, mist, dust, haze, smoke and rain can all make it harder to maintain visual line of sight, judge distance, see other aircraft, and keep the aircraft clear of obstacles.

The trap is that visibility may look acceptable at ground level but be worse along a slant path through haze or mist. If the observer or remote pilot cannot reliably see and orient the aircraft, the weather is already changing the operation.

- Low cloud can hide terrain, towers, masts, wires and crewed aircraft.
- Fog and mist can form quickly when temperature and dew point are close.
- Dust, haze and smoke can reduce contrast and make a small RPA difficult to orient.

Cloud type tells a story

Figure: Clouds are a visual weather report. Low cloud, rain cloud and vertical development each carry different RPA risks.

Clouds are visible clues about the air. Layered cloud often points to widespread stable conditions and reduced ceiling. Puffy cumulus points to rising air. Cumulonimbus is a major warning sign because it is linked to strong updrafts, downdrafts, turbulence, lightning, hail and heavy rain.

The exact cloud name is less important than the flying implication. Ask what the cloud says about visibility, turbulence, precipitation and change over the next part of the operation.

Thunderstorms and convection are no-go signals

Figure: The mature thunderstorm stage is the danger zone: updrafts, downdrafts, gust fronts, lightning, hail and heavy rain can all be present.

Convection is rising air. Gentle convection can produce thermals and bumps. Strong convection can build towering cloud and thunderstorms. For RPA operations, thunderstorms should be treated as a stop-work weather condition, not as something to work around at close range.

The mature stage of a thunderstorm can include heavy rain, hail, lightning, severe turbulence, strong downdrafts and gust fronts. Those hazards can arrive before the rain reaches the launch point.

- Watch for towering cumulus, virga, lightning, sudden wind shifts and rapidly darkening cloud.
- Dust devils and strong thermals indicate unstable rising air near the surface.
- If the weather is building quickly, land early and reassess.

Rain, humidity and temperature affect more than comfort

Figure: When temperature and dew point come together, cloud, fog or condensation become more likely.

Rain can reduce visibility, wet aircraft surfaces, affect payloads and sensors, and introduce water risk to electrical systems. Humidity matters because it helps explain fog, cloud and condensation. A small temperature-dew point spread means the air is close to saturation.

Extreme heat and cold can also reduce performance margin. Heat can stress batteries and electronics. Cold can reduce battery output and make voltage sag more noticeable under load. Both can change endurance from what the pilot expected.

- Do not assume battery endurance from a calm, mild day will hold in heat, cold or strong wind.
- Moisture can affect optics, payload data quality and electrical reliability.
- Precipitation static and charged dust or precipitation are weather warning signs around convective or unsettled conditions.

Use forecasts, reports and site observations together

Aeronautical forecasts and reports help with aviation-specific planning. Public forecasts help with broader local context. Field observations tell you what is happening at the launch site and along the planned flight path.

The professional habit is to compare the sources. If the forecast says benign conditions but the site shows gusts, dust, low cloud or building convection, the site gets a vote.

- Check current and forecast wind, gusts, cloud, visibility, rain and temperature.

- Look for signs of thermals, dust devils, turbulence, wind gradient and windshear.
- Review relevant aeronautical weather products for the operating area when available.
- Keep checking conditions during the job, not only before take-off.

Make the go, modify or no-go call

Weather decisions are not only go or no-go. Often the safest answer is to modify the task: reduce distance, change the flight line, increase crew separation, delay until visibility improves, fly a smaller area, or stop before the weather trend reaches the site.

If the operation depends on fine margins, delay or redesign the task. A good remote pilot is not rewarded for launching into a situation that was already doubtful on the ground.

- Go when conditions are inside aircraft, crew, site and approval limits with healthy reserve.
- Modify when the task can be made simpler and safer without pretending the risk has disappeared.
- No-go when control, visibility, separation, endurance or recovery margin is doubtful.

Practice: Why can a public forecast be insufficient on its own for a drone job?

Answer: It may not describe local gusts, turbulence or obstacles at the operating site.

Remote pilots need forecasts and local observations because small RPA are sensitive to site-level conditions.

Practice: A forecast wind is within the aircraft limit, but the launch site is downwind of buildings and trees with rapid gusts. What is the main concern?

Answer: Mechanical turbulence and gust spread may make the site riskier than the mean forecast wind suggests.

Local obstacles can create turbulent, changing airflow. The pilot should consider the actual site conditions, not just the mean forecast wind.

Practice: Why is a mature thunderstorm unsuitable for RPA operations nearby?

Answer: It can produce strong updrafts, downdrafts, gust fronts, lightning, hail and heavy rain.

Thunderstorm hazards can affect low-level RPA operations and can arrive before rain reaches the launch point.

Practice: What does a small temperature-dew point spread warn a remote pilot about?

Answer: The air is close to saturation, so fog, cloud or condensation may be more likely.

When air temperature approaches the dew point, the air may become saturated and visible moisture can form.

RBMO: Forecasts, Observations and Weather Hazard Decisions

Status: current

Source: RePL Study Guide pp. 107-140; Part 101 MOS C10 Schedule 4 Unit 3.

How to turn forecasts, observations, local signs and weather hazards into a clear go, modify or no-go decision.

Weather is an operating limit

A remote pilot does not read weather to sound clever. The point is to decide whether the aircraft, crew and site still have enough margin to complete the task and recover safely.

For small RPA, the important weather question is practical: what will the wind, visibility, cloud, rain, temperature and local air movement do to control, endurance, VLOS, separation and workload?

- Go when the forecast, site observations, aircraft limits and crew plan all agree.
- Modify when the work can be reduced, delayed, repositioned or shortened without hiding the risk.
- No-go when control margin, visual line of sight, recovery margin or separation is doubtful.

Build the weather picture in layers

Start broad, then narrow. Use the synoptic situation and forecast products to understand the trend, aviation weather products for the operating area when they are available, and site observations to confirm what is actually happening at launch height.

Airservices NAIPS processes meteorological and NOTAM information for pilot briefings, while the Bureau provides aviation forecasts, observations and warning products. For drone work, those sources should sit beside the operator’s own site checks and aircraft limits.

- Trend: is the weather improving, steady or deteriorating?
- Wind: mean wind, gusts, direction shifts and terrain or building effects.
- Visibility: haze, dust, smoke, rain, fog, low cloud and slant visibility.
- Hazards: thunderstorms, fronts, showers, strong thermals, windshear or turbulence.

Translate forecast language into decisions

Forecasts and observations usually describe wind, visibility, cloud, weather and pressure in compact aviation language. The study skill is to translate those details into plain operational meaning before the aircraft leaves the ground.

A TAF or weather briefing might point to a later change, but the job may be planned for the hour before that change arrives. That is not a free pass. If the operation has little reserve, a forecast change near the work window should push the pilot toward a shorter job, earlier landing or delay.

- Wind direction and speed tell you launch orientation, drift risk and return-home energy demand.
- Visibility and cloud tell you whether VLOS, obstacle clearance and traffic awareness remain credible.
- Weather groups such as rain, thunderstorms, mist, dust or smoke should be treated as task constraints.
- Changes and temporary conditions matter because drone jobs often operate on small weather margins.

Fog and low cloud can close the site quickly

Figure: If the pilot or observer cannot reliably see and orient the aircraft, the weather has already changed the operation.

When temperature and dew point sit close together, the air is near saturation. Fog, mist, low cloud or condensation can form with little warning, especially around dawn, after rain, in low-lying country or near water.

The hazard is not only that the aircraft becomes harder to see. Low visibility also reduces contrast, masks wires and masts, hides terrain cues and makes it harder to judge distance and attitude.

- Be cautious when the temperature-dew point spread is small.
- Look along the actual flight path, not just across the launch area.
- Treat improving visibility as something to confirm, not something to assume.

Inversions can trap haze, smoke and low-level wind

Figure: An inversion can make the air look layered: clearer above, but smoky, hazy or foggy where the RPA actually needs to operate.

A temperature inversion places warmer air above cooler air near the surface. That stable lid can trap smoke, dust, haze, fog and pollution close to the ground instead of letting it mix upward.

For remote pilots, the practical effect is a visibility and judgement problem. A site may look acceptable nearby while the flight path disappears into a shallow layer of haze, smoke or reduced contrast.

- Smoke and haze can reduce contrast before they fully block the view.
- Valleys, basins and sheltered low ground can hold poor visibility longer than exposed ridges.
- If smoke haze is forecast or visible, check current warnings and local authority information before operating.

Thunderstorm outflow and microburst risk are stop-work hazards

Figure: Outflow can arrive before the rain. If a storm is close enough to influence the wind at the site, land early and stop.

Thunderstorms are not just rain clouds. The Bureau describes key storm parts including updrafts, downdrafts and outflow. Cool air flowing away from a downdraft can spread quickly along the ground, often marked by a shelf cloud, dust, sudden wind shift or sharp temperature change.

A microburst or strong downdraft can produce a sudden burst of damaging wind near the surface. For a small RPA, that can overwhelm control margin, blow the aircraft downwind, reduce endurance and make recovery unpredictable.

- Watch for towering cumulus, cumulonimbus, shelf cloud, virga, dust walls and rapid darkening cloud.
- Treat lightning, thunder, gust fronts, hail, heavy rain and sudden wind shifts as no-go signals.
- Do not wait for rain to reach the launch point before recovering the aircraft.

Make the decision explicit

A professional weather decision should be traceable. The pilot should be able to say what was checked, what was observed on site, what limit or trigger would stop the job,

and when the next weather review will occur.
This is study guidance, not legal advice. Always verify current CASA, Bureau and Airservices information, follow the operator's procedures, and apply the aircraft manufacturer's environmental limits.

- Record the weather sources checked and the time of the check.
- Brief the crew on weather triggers: gusts, visibility, cloud, rain, storm development or smoke.
- Set a review point during the job, especially when the forecast trend is changing.
- Land early when the weather picture starts moving toward the limit.

Practice: Why should a remote pilot compare forecast information with site observations?
Answer: The forecast gives the trend, while the site shows local wind, visibility and obstacles affecting the actual operation.
A good weather decision uses both the broader weather picture and the operating site's real conditions.

Practice: What does a small temperature-dew point spread suggest for a drone operation?
Answer: Fog, mist, low cloud or condensation may become more likely.
When air temperature is close to the dew point, the air is near saturation and visible moisture can form.

Practice: Why can an inversion be a problem even on a calm morning?
Answer: It can trap smoke, haze, fog or dust near the surface and reduce visibility along the flight path.
A stable inversion can hold poor visibility near the ground where small RPA operate.

Practice: A thunderstorm is nearby, with a shelf cloud and dust moving toward the site but no rain at the launch point yet. What is the safest decision?
Answer: Land early or do not launch because outflow and gusts can arrive before the rain.
Thunderstorm outflow, gust fronts and downdrafts can create sudden low-level wind hazards before rain reaches the site.

REES: Batteries, Electronics and Signal Reliability
Status: current
Source: RePL Study Guide pp. 142-183; Part 101 MOS C10 pp. 97-99.
Understand the electrical chain that keeps an RPA powered, controlled and recoverable.

The aircraft is an electrical system before it is a camera platform
Figure: Power, control, navigation, telemetry and payload are connected. A weak electrical link can become an aircraft problem.
A remote pilot needs a working mental model of batteries, ESCs, receivers, antennas, GPS, telemetry and flight controllers. Most operational failures begin as something simple: poor state of charge, damaged connector, bad compass environment, weak GPS, interference or skipped pre-flight checks.
Treat the battery and command link as critical systems. If either becomes uncertain, the

flight should become conservative immediately.

Use the basic electrical words correctly

Voltage is electrical pressure. Current is flow. Resistance limits flow. Power is the rate of doing work, and capacity is the amount of stored energy available to the aircraft.

Remote pilots do not need to become electronics engineers, but they do need to recognise what these values mean on batteries, chargers, payloads and aircraft specifications.

- High current draw can heat components and cause voltage sag.
- A payload can change endurance by adding mass and electrical load.
- A damaged connector, swollen battery or unreliable charger is a safety issue, not a nuisance.

Battery management is operational risk management

Figure: Battery reserve is not a spare luxury. It is the margin that lets the pilot handle wind, delay, go-around or recovery.

Battery endurance is affected by state of charge, pack health, temperature, aircraft mass, payload, wind, climb demand and the distance back to a safe landing area.

The important habit is to plan the landing before the reserve disappears. A low-battery warning is not a target; it is a boundary that should already have been built into the flight plan.

- Check charge state, pack condition, cycle history and storage condition before flight.
- Allow more reserve for wind, cold, heat, payload or long return legs.
- Quarantine batteries with swelling, damage, abnormal heat or unexplained voltage behaviour.

Charging and transport need discipline

Battery risk does not begin at take-off. Charging, storage, transport and post-flight handling all matter. Use compatible chargers, appropriate charge settings and operator procedures for storage and damaged batteries.

After a flight, a hot or stressed pack may need to cool before charging. A battery that has been dropped, crushed, over-discharged or physically damaged needs conservative treatment.

Make reliability visible

Good electrical management is not guesswork. It is logging battery health, checking firmware and configuration, understanding payload power demand, and respecting environmental risks such as powerlines, LTE, Wi-Fi and electromagnetic interference.

- Know what voltage, current, capacity and C-rating mean for the aircraft in use.
- Check battery serviceability before launch and after recovery.
- Understand what the aircraft will do if GPS, command link or remote pilot station functions degrade.

GPS and compass systems are useful but conditional

GPS gives position information, but it depends on satellite geometry, receiver quality, antenna placement and the local environment. Compass and IMU systems can also be

affected by metal structures, vehicles, reinforced concrete, magnets and electrical fields.
If the aircraft is relying on GPS hold, return-to-home or an automated route, poor positioning or heading information can turn into a flight-path problem quickly.
- Check satellite count and positioning quality before relying on GPS-assisted modes.
- Keep launch and calibration areas away from obvious magnetic and electrical interference.
- Know how the aircraft behaves if GPS hold degrades or drops out.

Radio links need line of sight and clean antennas
Figure: Radio performance depends on line of sight, antenna setup and the local RF environment.
Command, control and telemetry links are affected by distance, antenna orientation, obstructions, terrain, other transmitters and aircraft attitude. A good link at launch does not guarantee a good link behind a structure or over a ridgeline.
Treat link warnings seriously. If the control link, video link or telemetry becomes unreliable, the flight should move toward recovery, not deeper into the task.

EMI is a site hazard
Electromagnetic interference can come from power infrastructure, transmitters, industrial sites, vehicles, buildings, poor installation, damaged shielding or payload equipment. It may show up as compass errors, control-link warnings, video breakup or unstable sensor behaviour.
The pilot’s response is practical: identify EMI sources during site assessment, position the launch point sensibly, keep antennas and cables serviceable, and land or relocate if the aircraft behaves abnormally.

Failsafe behaviour must be understood before flight
Return-to-home, hover, land, hold, flight termination and parachute actions are not interchangeable. The right failsafe depends on the aircraft, the airspace, nearby people, obstacles, wind and the type of failure.
Electrical and electronic reliability is therefore not just maintenance knowledge. It is part of the emergency plan that the crew should brief before launch.

Practice: Which action best supports battery risk management?
Answer: Checking battery condition, charge state and logs before flight.
Battery condition and state of charge directly affect endurance, safety margins and recovery options.

Practice: Why can a payload change battery risk even if it is electrically compatible?
Answer: It can add mass and power demand, reducing endurance and performance margin.
Payloads can affect both aircraft mass and electrical load, so endurance and recovery margin should be recalculated.

Practice: What is the safest response to repeated GPS or compass warnings before launch?
Answer: Stop, investigate the site and aircraft, and do not rely on GPS-assisted modes

until the issue is resolved.
Navigation sensor warnings can indicate interference, poor setup or a system fault that affects control modes and failsafes.

Practice: What should link warnings during flight usually trigger?
Answer: A conservative move toward recovery or improved link conditions.
Unreliable command, video or telemetry links reduce safety margin and should be managed early.

REES: Battery Management, Charging and Power Margins
Status: current
Source: RePL Study Guide pp. 161-165; Part 101 MOS C10 pp. 97-99; CASA Pack Right lithium battery guidance and AC 101-03 v2.0 Appendix C checked 2026-05-19.
Read battery labels, calculate usable energy, manage charging and storage risk, and preserve enough reserve to recover the aircraft safely.

A battery is an energy source and a limitation
Figure: Battery labels describe capability. Flight planning decides how much of that capability can be used safely.
The battery is not just a consumable. It is one of the main limits on endurance, payload, climb, recovery, return distance and emergency options.
A remote pilot should be able to read the battery label, understand the practical meaning of voltage, capacity, watt hours and discharge rating, and then connect those numbers to the job being flown.

Voltage, capacity and watt hours answer different questions
Voltage is electrical pressure. Capacity, normally shown as amp hours or milliamp hours, tells you how much charge the pack can store. Watt hours estimate total energy by combining voltage and capacity.
The simple study calculation is watt hours equals volts multiplied by amp hours. A 22.2 volt, 5 amp hour pack is about 111 watt hours before real-world losses and reserve are considered.
- Use nominal voltage for study calculations unless the procedure specifies otherwise.
- Convert milliamp hours to amp hours before multiplying.
- Treat the result as planning information, not a promise of exact flight time.

C rating is about discharge margin
C rating describes how quickly a battery can be discharged relative to its capacity. A pack with too little discharge capability can sag under load, heat up, trigger warnings or reduce aircraft performance.
For remote pilots, the practical point is conservative: use approved batteries, avoid pushing packs beyond the manufacturer’s limits, and investigate abnormal voltage sag, heat or warning behaviour.

Reserve is planned before launch
Figure: Reserve is where the pilot buys time for wind, delay, repositioning and

recovery.
Battery reserve is the margin that allows for wind, delay, missed landing, go-around, repositioning, unexpected climb demand or a longer recovery path.
Low-battery warnings should not be used as the planned landing point. The crew should brief the planned landing threshold, minimum reserve, emergency threshold and what happens if the aircraft is farther away than expected.
- Increase reserve for wind, cold, heat, payload, degraded packs or long return legs.
- Land earlier when telemetry trends do not match the expected endurance.
- Stop the task before battery state forces a rushed recovery.

Charging is part of flight safety

Figure: Battery handling continues after landing: inspect, cool, charge correctly, store safely and quarantine anything suspicious.
Charging errors can damage batteries or create fire risk. CASA's model-aircraft guidance warns that LiPo batteries need care, compatible chargers and suitable charge control, and that damaged, puffed or unsafe cells should not be flown.
The operator procedure should define where packs are charged, how they are supervised, when they are cooled before charging, how damaged packs are quarantined and how cycle or health data is recorded.

Storage, transport and disposal need their own checks

Battery risk continues after the aircraft lands. Packs may be hot, physically stressed, over-discharged or damaged after a hard landing. Storage and transport should protect terminals, prevent short circuits and follow current dangerous-goods and airline requirements where relevant.
CASA Pack Right guidance is a reminder that lithium battery carriage can have specific conditions. Operational crews should check current airline, dangerous-goods and operator requirements before moving batteries by air.

Damaged packs are not negotiation points

Swelling, punctures, crushed cases, abnormal heat, damaged leads, loose connectors, unexplained voltage behaviour or repeated charger errors should take a pack out of service until it is assessed under the operator procedure.
A battery problem is not fixed by needing the aircraft for one more flight. The safe decision is to quarantine, record and replace.

Practice: What does watt hours estimate for an RPA battery?
Answer: The total energy stored, based on voltage multiplied by amp hours.
Watt hours combine voltage and capacity to estimate stored energy before real-world losses and reserve.

Practice: Why should a low-battery warning not be the planned landing point?
Answer: Because reserve is needed for wind, delay, repositioning and recovery margin.
The pilot should plan to land with usable margin rather than allowing the battery state to force the decision.

Practice: What should happen to a swollen or physically damaged lithium battery?
Answer: It should be quarantined and handled under the operator's damaged-battery procedure.
Physical damage, swelling or abnormal behaviour can indicate a serious battery risk.

Practice: What is the safest source for battery transport requirements by airline?
Answer: Current CASA dangerous-goods guidance, airline rules and operator procedures.
Lithium battery carriage requirements can be specific and should be checked from current sources.

RHPF: Human Performance and Threat and Error Management
Status: current
Source: RePL Study Guide pp. 241-275; Part 101 MOS C10 pp. 100-102.
Use airmanship, personal fitness, workload control and crew communication to catch problems before they become incidents.

The remote pilot is part of the system
RPA operations can feel screen-based, but the same human performance traps remain: fatigue, time pressure, overconfidence, distraction, heat, dehydration and poor communication.
Airmanship is the habit of keeping the operation safe when the plan meets the real world. For remote pilots, that means aviate, navigate and communicate: keep the aircraft under control, know where it is and where it is going, then keep the right people informed.
- Aviate: keep control, energy, height, battery and recovery options ahead of the aircraft.
- Navigate: maintain orientation, position awareness, airspace awareness and site boundaries.
- Communicate: brief clearly, call threats early and confirm instructions are understood.

RPA pilots have different sensory information
A crewed-aircraft pilot can feel acceleration, vibration, attitude change and aircraft response through the body. A remote pilot receives most of that information through screens, telemetry, sound, sight and crew calls.
That gap matters. System latency, camera delay, map lag or a weak control link can make the aircraft state feel slightly behind the real aircraft. Good remote pilots avoid flying as if the screen is the aircraft.
- Look at the aircraft and the site, not only the screen.
- Treat telemetry as decision support, not as a substitute for situational awareness.
- Use conservative margins when latency, glare, poor contrast or workload increase.

Fit to operate comes before fit to fly
Figure: Human performance starts before take-off: the pilot's condition is part of the risk assessment.
A serviceable aircraft does not make a safe operation if the pilot is not fit to

operate. Illness, medication, stress, alcohol, drugs, fatigue, dehydration, heat, cold and strong emotion can all reduce attention and judgement.

The professional move is to decide this before launch. If the pilot is tired, unwell, rushed or emotionally loaded, the operation may need another pilot, a delay, a reduced scope or a stop-work call.

- Colds, hay fever, congestion, headache and migraine can reduce concentration and comfort.
- Prescription and over-the-counter medicines can affect alertness and judgement.
- Heat, dehydration and fatigue can creep up slowly during outdoor jobs.

Vision is not a perfect sensor

Figure: VLOS is a human task: if the aircraft is hard to see or orient, the operation is already losing safety margin.

Visual line of sight depends on human vision. Distance, height, glare, background clutter, colour, haze, cloud and low contrast can all make a small aircraft hard to see or orient.

Empty field myopia can occur when the eye has little to focus on, and relative motion can make it harder to judge whether another aircraft, bird or object is moving toward or away from the RPA. The remedy is not bravado; it is scanning, observers, sensible distances and clear lost-visual actions.

- Use suitable sunglasses or prescription glasses where needed and permitted.
- Brief what the crew will do if the pilot or observer loses visual contact.
- Avoid screen fixation during critical phases, near obstacles or near other airspace users.

Stress narrows thinking

Stress can be short-term, such as a sudden aircraft warning, or long-term, such as fatigue, work pressure or conflict at home. Either can narrow attention, reduce memory, rush decisions and make a pilot more likely to press on.

Pressure can come from pride, peer pressure, employer pressure, customer expectation or the desire to get the job done. A good pilot recognises those pressures as threats, not as reasons to lower the standard.

- Use checklists and aide-memoires when workload rises.
- Slow the operation down before overload becomes an error.
- Use stop-work language that every crew member is allowed to call.

Threat and error management is a loop

Figure: TEM is not paperwork. It is a live loop: threat, error, aircraft state, recovery and learning.

Threat and error management is the discipline of finding the threat early, trapping the error before it becomes an aircraft state, then recovering while there is still margin.

Strategic risk management happens before flight: site selection, crew, approvals, weather and procedures. Tactical risk management happens during flight: gusts increase, a battery warning appears, a bystander moves, or the aircraft drifts toward a boundary.

- Threat: something outside or inside the crew that can reduce safety margin.
- Error: an action or omission that can move the operation away from the plan.

- Undesired aircraft state: the aircraft or operation is now in a condition that needs recovery.
- Recovery: stop, hold, climb, land, re-brief or otherwise return to a controlled state.

Crew coordination is an operational control

Figure: The message is complete only when it is heard, understood, acted on and confirmed.

Observers, payload operators and remote pilots need shared words for stop, hold, traffic, lost link, low battery and emergency recovery. If the crew cannot communicate clearly, the operation is already carrying extra risk.

Good crew communication is closed-loop. A person makes a call, the receiver acknowledges it, the action is taken, and the result is confirmed. This reduces assumptions and catches errors early.

- Use plain, brief calls during critical moments.
- Give observers permission to be assertive when they see traffic, people, hazards or drift.
- Re-brief when the plan changes instead of relying on everyone to infer the new plan.

Build the habit before the pressure arrives

Human performance training is not about blaming people. It is about designing the operation so ordinary human limits are less likely to become safety events.

The practical standard is simple: brief the threats, check personal fitness, use checklists, keep workload manageable, communicate clearly and stop early when the operation is drifting from the plan.

- If the pilot is not fit, delay or replace the pilot.
- If the aircraft is hard to see, bring it closer or land.
- If workload is rising, simplify the task.
- If the crew is confused, hold or land and re-brief.

Practice: What is the main purpose of threat and error management?
Answer: To identify and manage threats and errors before they reduce safety.
TEM is a structured way to anticipate threats, trap errors and recover before safety margins erode.

Practice: Which example best shows good airmanship during an RPA operation?
Answer: Landing early when wind, battery and workload are all trending the wrong way.
Good airmanship protects safety margin. Landing early is often the professional decision when threats are stacking up.

Practice: Why can screen fixation be hazardous for a remote pilot?
Answer: It can reduce awareness of the aircraft, obstacles, people and other airspace users.
Telemetry and camera views are useful, but the pilot must maintain situational awareness of the real aircraft and operating environment.

Practice: In closed-loop crew communication, what should happen after an observer calls

’traffic right’?
Answer: The remote pilot acknowledges, acts if required, and confirms the traffic or plan.
Closed-loop communication reduces assumptions by making sure critical information is heard, understood and acted on.

RHPF: Decision-Making, Risk Matrix and Operational Worksheets
Status: current
Source: RePL Study Guide pp. 241-275; Part 101 MOS C10 Schedule 4 Unit 5.
Turn human factors theory into practical remote pilot decisions using decision-trap checks, a simple risk matrix and live TEM worksheets.

Human factors become visible in decisions
Human performance is not just a list of personal limitations. It shows up in ordinary decisions: launch now or wait, continue or land, trust the plan or update it, accept a client request or hold the line.
The remote pilot’s job is to make those decisions deliberate. That means noticing pressure, naming the risk, choosing a control and leaving a decision trail that another competent person could understand later.
- If the crew is rushing, slow the operation down.
- If the plan no longer matches the site, update the plan before launch.
- If the risk control is vague, the operation is not yet controlled.
- If the decision cannot be explained simply, pause and re-brief.

Pressure creates decision traps
Figure: Decision traps are easier to manage when the crew names them before the flight becomes urgent.
Most poor decisions do not feel careless at the time. They often feel efficient, loyal, confident or helpful. That is why pressure should be treated as a threat in its own right.
Common traps include confirmation bias, plan continuation, risky shift and screen fixation. The practical countermeasure is to give the crew a short pause point where someone asks what has changed and whether the operation still has margin.
- Confirmation bias: only noticing information that supports the plan you already wanted.
- Plan continuation: pressing on because stopping would be inconvenient.
- Risky shift: a group becoming more comfortable with risk than any one person should be.
- Screen fixation: losing the aircraft, site or airspace picture because the display is absorbing attention.

Use a risk matrix as a conversation starter
Figure: The matrix starts the discussion. The worksheet makes the decision traceable.
A risk matrix is not magic. It will not make a bad operation safe by colouring a square green. Its value is forcing the crew to discuss likelihood, consequence, controls and the residual risk after those controls are applied.

The strongest remote pilot habit is plain wording: this hazard could cause this outcome, so we will apply this control, and our final decision is go, modify, delay or stop.

- Likelihood asks how credible the event is in this operation, not in aviation generally.
- Consequence asks what could happen if the hazard is not controlled.
- Controls should reduce likelihood, consequence or exposure.
- Residual risk is the risk left after the control is actually in place.

Turn TEM into a live worksheet

Figure: TEM works when it is live: the same loop supports the pre-flight brief, in-flight callout and post-flight review.

Threat and error management is easiest to teach as a loop. Identify the threat, choose a countermeasure, trap errors early, recover before the aircraft state becomes unsafe, then learn from the job.

In a remote pilot briefing, this can be a short worksheet rather than a long speech. The crew should know the top threats, the stop words, the recovery action and who has authority to call a hold or landing.

- Threat: what can push the job away from the plan?
- Countermeasure: what will we do before that happens?
- Error trap: how will the crew notice and call it early?
- Recovery: what action returns the operation to a controlled state?

Give every crew member a useful voice

Crew coordination is a control only when the crew knows what to say and when to say it. An observer who is unsure whether they are allowed to interrupt is not an effective observer.

The pre-flight brief should give plain callouts for traffic, people, loss of visual contact, battery concerns, weather change, boundary drift and confusion. Closed-loop communication then confirms the message was heard and acted on.

- Use short calls: stop, hold, land, traffic, people, visual lost, battery, boundary.
- Acknowledge critical calls so the sender knows the message landed.
- Re-brief after any material change instead of relying on assumptions.
- Protect assertive calls from rank, customer pressure or embarrassment.

Use personal minimums before the legal minimums

Legal limits are not always enough for a particular pilot, aircraft, crew or site. Personal and operational minimums help prevent a pilot from negotiating with the limit while under pressure.

Examples include maximum gust spread, minimum battery reserve, maximum distance for reliable VLOS, minimum crew numbers for complex sites, a maximum number of concurrent tasks, or a rule that any lost-visual event triggers an immediate hold or landing.

- Write personal minimums before the job, not during the hard moment.
- Make the minimum measurable where possible.
- Brief the trigger and the action together.
- Tighten the minimum when fatigue, heat, glare, poor visibility or complex airspace increases workload.

Debrief the decision, not just the flight
A short debrief closes the learning loop. It should ask what changed, what was missed, which controls worked, which calls were useful and what the next operation should do differently.
This is study guidance, not legal advice. Use current CASA guidance, operator procedures and aviation reviewer advice when setting risk matrices, operational thresholds and reporting requirements.
- What was the strongest threat today?
- Which control gave us the most safety margin?
- Where did workload rise?
- What should be changed in the JSA, checklist or brief before next time?

Practice: Why is pressure treated as a threat in remote pilot decision making?
Answer: Because it can encourage plan continuation, rushed thinking and acceptance of weaker controls.
Pressure can narrow thinking and make an unsafe decision feel reasonable. Naming it early helps the crew manage it.

Practice: What is the most useful role of a risk matrix in an RPA job brief?
Answer: To start a clear discussion about likelihood, consequence, controls and residual risk.
A matrix is useful when it supports a traceable decision. It is not a substitute for judgement.

Practice: Which statement best describes plan continuation bias?
Answer: Continuing with the original plan even though new information suggests it should change.
Plan continuation is a decision trap. The countermeasure is to pause, ask what has changed and re-decide.

Practice: What makes a crew callout effective during a busy RPA operation?
Answer: It is short, specific, acknowledged and linked to an action if needed.
Closed-loop communication helps critical information become shared action, not just background noise.

RKOP: Operational Risk, Logs and Emergencies
Status: current
Source: RePL Study Guide pp. 44-65 and 267-270; Part 101 MOS C10 pp. 103-105.
Turn a planned task into a controlled operation through risk assessment, records, serviceability checks and emergency thinking.

A job is not ready just because the aircraft is ready
Figure: A controlled operation connects planning, briefing, monitoring, recovery and records.
Operational readiness includes crew briefing, bystander control, aircraft

serviceability, payload implications, technical logs, emergency options and the decision path for approvals.

The latest C10 MOS includes tethered operations in RKOP, so this web guide treats tethering as an operational topic to be planned, controlled and reviewed rather than as a shortcut around normal discipline.

General operations begin on the ground

Starting motors, ground running, launch layout, bystander control and crew briefing are all operational controls. The aircraft may be ready to fly, but the site may not be ready for flight.

The remote pilot must also work inside the operator's documented practices and procedures, not just the manufacturer's app workflow.

- Brief roles, boundaries, stop words, emergency actions and the landing area.
- Control bystanders before propellers turn.
- Think about noise, wildlife and site impact before and after the operation.

Risk assessment is a working tool

A job safety assessment should identify hazards, assess the operational risk, choose controls and leave a decision trail. It should not be paperwork written after the real decision has already been made.

Strategic risk assessment happens during planning. Tactical risk assessment continues at the site and during flight as weather, people, aircraft state and airspace conditions change.

- Hazard: what can cause harm or loss of control?
- Risk: how likely is it and how serious would it be?
- Control: what action reduces likelihood, consequence or exposure?
- Decision: go, modify, delay or stop.

Airworthiness is a pilot responsibility too

The remote pilot is not expected to rebuild the aircraft before every job, but they are expected to determine whether the RPAS is serviceable for the specific operation.

Technical logs, defect reporting, maintenance status, firmware state, propeller condition, battery history and payload fit all feed that decision.

- Do not launch with unresolved defects that affect safe operation.
- Use the technical log to track problems instead of relying on memory.
- Report unserviceability through the operator's procedure.

Payloads change the aircraft and the job

Role equipment and sensors can change mass, balance, endurance, electrical demand, drag, privacy considerations and the way the aircraft must be flown.

A camera, thermal sensor, LiDAR, spray tank, winch or tether is not just attached equipment. It changes the operational risk picture and should be part of the briefing.

Accidents and incidents must be reported through the right channel

The study guide can explain the difference between ordinary defects, incidents and accidents, but the actual reporting decision must follow current law, operator

procedures and any applicable transport safety reporting requirements.
The conservative habit is to preserve information early: time, location, aircraft, crew, sequence of events, injuries, damage, battery state, logs and any downloaded aircraft data.

Emergency actions must be chosen before launch

Figure: Emergency actions need a priority order before launch, because failures compress thinking time.

Return-to-home, immediate landing, holding points, parachutes and flight termination are not interchangeable. The right response depends on airspace, people, terrain, aircraft state and what the failure actually is.

- Motor failure immediately after launch needs a different response from a slow battery warning.
- Lost link should already have a known failsafe action and recovery area.
- Bird attack, flyaway, fire, crash, injured person and loss of navigation all need pre-briefed decision paths.

Aerodrome and above-400-ft operations need extra discipline

Operations near aerodromes and operations above 400 ft AGL are not ordinary field jobs with a bigger number. They need careful source checking, approval pathways, traffic awareness and a clear understanding of what the operator is authorised to do.
If the legal or procedural basis is uncertain, the job should pause until the chief remote pilot or nominated aviation reviewer resolves it.

Tethered operations are still operations

A tether can reduce some risks and introduce others. It may affect launch setup, snag hazards, bystander control, electrical safety, emergency response, aircraft performance and recovery options.
Treat tethering as a specific operating method with its own checks and limitations, not as a casual shortcut.

Practice: Why should emergency actions be briefed before launch?
Answer: Because time pressure during a failure makes improvisation risky.
Pre-briefed actions reduce delay and confusion when control link, motor, battery or airspace problems occur.

Practice: What is the purpose of a job safety assessment for an RPA operation?
Answer: To identify hazards, assess risk, choose controls and record the decision path.
A JSA is a practical risk-management tool that supports planning, briefing and review.

Practice: A payload is added to an aircraft that was serviceable yesterday. What should the pilot consider?
Answer: Mass, balance, endurance, electrical demand and task risk may have changed.
Role equipment and sensors can change aircraft performance and operational risk.

Practice: Why should a tethered operation still be formally planned?

Answer: A tether changes hazards, setup, bystander control and emergency recovery options.
Tethering is an operating method with specific risks and controls.

RKOP: Incident Reporting, Fitness and Post-Event Actions
Status: current
Source: RePL Study Guide pp. 99-102 and 267-270; Part 101 MOS C10 Schedule 4 Unit 6.
Handle defects, incidents, accidents, fitness-to-operate concerns and post-event learning with a calm, traceable response.

Post-event discipline starts before the event
A remote pilot should not be inventing the reporting pathway after something has gone wrong. The operator’s procedures should already say who is contacted, what information is preserved and what stops the aircraft from being flown again until it is cleared.
The study skill is to separate the first response from the later investigation. First response protects people, makes the site safe and preserves evidence. Investigation and reporting then follow the operator’s procedure and current CASA or ATSB requirements.
- Protect people and property before paperwork.
- Stop the aircraft from being reused until serviceability is resolved.
- Preserve logs, photos, notes and battery information while memories are fresh.
- Escalate early if the event may be reportable or safety-critical.

Use the same calm order every time
Figure: The response order matters: people first, then aircraft/site safety, then evidence, notification and learning.
After a crash, flyaway, hard landing, near miss, injury, property damage, battery event or control-link problem, the crew needs an ordered response. Panic and improvisation are poor controls.
A simple order is stabilise, make safe, preserve, notify and review. That sequence keeps immediate safety ahead of administration, while still protecting the information needed for a proper report and learning loop.
- Stabilise: check people, public safety, fire, traffic and immediate hazards.
- Make safe: isolate batteries if safe, secure the aircraft and protect the site.
- Preserve: collect facts without disturbing anything unnecessarily.
- Notify: follow operator, client, ATSB, CASA and emergency-service pathways as applicable.

Sort the event before deciding the pathway
Figure: Use the ladder as a prompt, not as a legal shortcut. If the event might be reportable, escalate and verify the current requirement.
Not every defect is an accident, and not every abnormal flight is immediately reportable. The safest working habit is to sort the event conservatively, then escalate to the chief remote pilot, safety manager or nominated reviewer if the category is unclear.
CASA points aviation accidents and serious incidents toward ATSB reporting, while ATSB reporting rules distinguish immediately reportable matters from routine written reports.

The details can change and depend on the aircraft, operation and occurrence, so this lesson should be treated as a study framework rather than a legal decision tree.

- Defect: record it, quarantine if needed and rectify before further flight.
- Operational incident: preserve facts and report internally under the operator's procedure.
- Accident, serious incident or reportable occurrence: check ATSB/CASA notification requirements immediately.
- Emergency or active public risk: emergency response comes before aviation paperwork.

Preserve the right information

Figure: Good notes reduce guesswork later. Capture the aircraft, battery, logs, weather, site and crew story while it is fresh.

A post-event report is only as good as the information preserved at the time. Logs may be overwritten, batteries may be swapped, aircraft may be moved and witnesses may leave.

Preservation does not mean leaving a hazard uncontrolled. Make people, batteries and the site safe first, then capture the information needed to understand what happened.

- Aircraft condition, damage photos, serial numbers and payload state.
- Flight logs, app screenshots, telemetry, warnings and controller status.
- Battery identity, charge state, temperature, swelling, damage or unusual behaviour.
- Weather, time, location, site layout, boundaries, crew roles and witness details.

Fitness to operate is part of the occurrence picture

Illness, fatigue, medication, stress, alcohol, drugs and heat exposure can all affect remote pilot performance. If any of those factors may have contributed to an event, they need to be handled honestly through the operator's safety process.

A pilot should also be fit to continue after an event. Shock, embarrassment or pressure to finish the job can degrade judgement. If the pilot or crew is unsettled, the professional decision may be to stop the operation and hand the next decision to the chief remote pilot or another competent person.

- Do not continue simply because the aircraft still powers on.
- Do not hide medication, fatigue, alcohol, drug or stress factors from the internal safety review.
- Use operator procedures for drug and alcohol management, fitness checks and stand-down decisions.
- Treat post-event stress as a safety factor, not a character flaw.

Reporting is not the same as blame

A safety report should make the next operation safer. The useful questions are what happened, what changed, what control failed or was missing, and what needs to change before the aircraft or crew does the same task again.

For RePL study, the practical standard is: record the facts, notify through the correct pathway, quarantine unsafe equipment, review the risk controls and update the procedure if the lesson applies beyond one flight.

- Separate facts from opinions in the first record.
- Record uncertainty rather than guessing.
- Check whether the technical log, JSA, checklist, training record or maintenance system

needs an update.
- Close the loop by briefing the change before the next similar operation.

Keep the public version conservative
This web guide can teach the response habit, but it cannot decide the reporting outcome for a real event. Reporting obligations depend on current legislation, ATSB requirements, CASA guidance, operator procedures and the exact facts.
When in doubt, preserve the information and escalate. A late or missing report is harder to fix than an early call asking whether a report is required.

Practice: What should be the first priority after an RPA crash or serious abnormal event?
Answer: Protect people and make the immediate site safe.
Immediate safety comes first. Evidence preservation and reporting follow once people, fire, traffic and site hazards are controlled.

Practice: Why should flight logs, photos and battery details be preserved after an event?
Answer: They help the operator understand what happened and meet any reporting or review requirements.
Good records support internal review, serviceability decisions and any required external reporting.

Practice: If a remote pilot is unsure whether an event is reportable, what is the safest next step?
Answer: Preserve the information and escalate through the operator’s reporting pathway for advice.
Unclear reporting status should be resolved using current operator, ATSB and CASA guidance rather than guesswork.

Practice: Why can fitness to operate matter after an incident as well as before launch?
Answer: Shock, stress or embarrassment can affect judgement and make continuing unsafe.
Post-event stress can reduce decision quality. The professional response may be to stop, reassign or seek chief remote pilot guidance.

RORA: Rules, Licences and Current Sources
Status: current
Source: RePL Study Guide pp. 40-55; Part 101 MOS C10 p. 106.
Know which rules apply, how to keep sources current and why a RePL sits inside a wider operator framework.

Use current rules, not remembered rules
Figure: Use the latest official source, then connect it to the operator’s procedures and the job pack.
The attached study guide remains an important teaching source, but law and guidance change. This web guide therefore points learners back to the current MOS, CASA guidance

and official operational sources.
A RePL authorises a person for specified RPA categories and weights, but commercial operations also depend on the operator, approvals, procedures and the conditions of the specific job.

Know what each source is for

The regulations set the legal framework. The MOS gives detailed standards. CASA guidance helps explain how the regulator expects people to comply. Airservices and aeronautical publications provide operational information such as airspace, aerodrome and NOTAM detail.
Operator procedures then translate that framework into how a particular organisation plans, briefs, flies, records and reports its work.

- Check the current compilation date, not just the title of a document.
- Use official sources for legal and operational decisions.
- Treat training notes as study support, not as a live legal authority.

A RePL has conditions and boundaries

A remote pilot licence is not a blanket permission to conduct any drone job. It sits inside aircraft category, weight class, operational approvals, operator procedures and any conditions that apply to the pilot or operator.
Some work also depends on approvals held by the certified RPA operator, not only the pilot’s personal qualification. The remote pilot should know when the job needs escalation to the chief remote pilot or approvals holder.

Currency is an operating habit

Figure: Current-source discipline links the law and guidance to the operator procedure and the limits actually briefed for the job.
Rules, MOS compilations, CASA guidance, operational advice, NOTAMs, airspace data and internal procedures can all change. A current-source check is therefore part of operational discipline.
If a learner remembers a rule from an older course, the right response is not to argue from memory. The right response is to check the current source and document the decision.

The study guide is not legal advice

This material is for study and training support. Before an operation, remote pilots should verify the current legal position using official CASA and Airservices sources and their organisation’s approved procedures.

When uncertain, stop and escalate

Air law uncertainty is not a reason to improvise. If the team is unsure about an approval, boundary, licence condition, operating limitation or source conflict, the safe action is to stop and ask the responsible aviation authority inside the organisation.
For this public web guide, uncertain or changeable legal detail should remain conservative and marked for aviation review rather than turned into overconfident operational advice.

Practice: Why should a remote pilot check current official sources rather than relying only on old notes?
Answer: Because legislation, MOS compilations and CASA guidance can change.
The current legal and operational position must be verified from official sources.

Practice: Why is a RePL not enough by itself for every commercial drone job?
Answer: The job may also depend on operator approvals, procedures, airspace, aircraft limits and specific conditions.
A licence is only one part of the legal and operational framework for an RPA operation.

Practice: What should a remote pilot do when two sources appear to conflict?
Answer: Pause, check the current official source and escalate through operator procedures if needed.
Source conflicts should be resolved before flight, especially where legal authority or approval conditions are involved.

RORA: RePL, ReOC and Operating Categories
Status: current
Source: RePL Study Guide pp. 44-55; Part 101 MOS C10 p. 106; CASA RePL/ReOC and drone weight category guidance checked 2026-05-19.
Separate pilot authority, operator authority and operating category so a drone job starts from the right legal framework.

Start with the operation, not the aircraft
Figure: A good legal check connects the source, category, pilot authority, operator authority and job pack before launch.
A drone that can physically do a job is not automatically authorised to do that job. The legal question starts with the operation: why the aircraft is being flown, who is responsible for it, what category it falls into, what approvals apply, and what procedures control the work.
For study, keep the framework simple. The pilot needs authority to fly. The operator may need authority to conduct the operation. The job itself may need a permission, approval or documented operating condition.

RePL is pilot authority, not the whole job approval
A Remote Pilot Licence shows that a person has been licensed for specified RPA categories and operating privileges. It matters, but it does not replace the operator’s certificate, operating procedures, airspace permissions, aircraft limits or job-specific controls.
A common learner trap is thinking the licence is the finish line. In commercial operations, the RePL is one part of a wider chain. The remote pilot still needs to work inside the organisation’s approved procedures and any conditions attached to the operation.
- Check the aircraft category and weight class relevant to the pilot.
- Check whether the operation needs a ReOC, excluded category framework or other

approval.
- Check whether the operator’s procedures allow the job as planned.
- Escalate to the chief remote pilot or accountable operator role when the authority chain is unclear.

ReOC is operator authority

A remotely piloted aircraft operator’s certificate is about the organisation or operator conducting RPA operations. It is not the same thing as an individual pilot licence.
Where a ReOC applies, the practical question for the remote pilot is: does this operation sit inside the operator’s approved privileges, manuals, procedures, personnel responsibilities and any specific CASA permissions?

Excluded category still has boundaries

CASA’s excluded category framework allows certain lower-risk work without a ReOC when the operation fits the category requirements. That does not make it unregulated or informal.
A pilot should check the aircraft weight, operating purpose, notification or record requirements, distance from people, VLOS, height, airspace and other standard limits before treating an operation as excluded category.
- Confirm the operation is eligible before using the excluded category pathway.
- Do not stretch an excluded category job into work that needs a ReOC or approval.
- Keep current-source evidence where the operator procedure requires it.

Standard operating conditions are a baseline

Standard operating conditions are the familiar safe-operating baseline for many RPA tasks: daylight, VLOS, below the normal height limit, away from people, outside prohibited/restricted/controlled airspace unless authorised, and clear of emergency operations.
The point is not to rote-learn a slogan. The point is to recognise when a planned job leaves the baseline and needs extra authority, extra planning or a different decision.

Document the authority chain

Figure: A RePL is one link. The operator, aircraft, job conditions and approvals also need to fit.
A commercial job pack should make the authority chain visible. It should show who is operating, who is flying, what framework applies, what approvals or procedures are being relied on, and what limits are briefed to the crew.
That record does not need to be theatrical. It needs to be specific enough that another competent person can understand why the job was considered authorised at the time it was flown.

Practice: What is the main difference between a RePL and a ReOC?
Answer: A RePL is pilot authority; a ReOC is operator authority.
The pilot licence and operator certificate solve different parts of the legal framework.

Practice: Why must excluded category operations still be checked carefully?

Answer: They only apply when the operation fits the category requirements and operating limits.
Excluded category is a defined pathway, not a blank permission.

Practice: What should the remote pilot do if a job does not fit the normal baseline conditions?
Answer: Check what extra approval, procedure or operational control is required before flight.
Leaving the baseline can trigger extra authority, planning or approval requirements.

Practice: What should a job pack make clear for commercial RPA work?
Answer: Who is operating, who is flying, what authority applies and what limits were briefed.
A traceable authority chain helps the operator and crew show why the job was authorised and controlled.

RORA: Operating Limits, VLOS, Populous Areas and Approvals
Status: current
Source: RePL Study Guide pp. 55-65 and 99-102; Part 101 MOS C10 p. 106; CASA drone safety rules and flight approvals guidance checked 2026-05-19.
Turn the headline drone rules into an operational go/no-go check: height, VLOS, people, populous areas, BVLOS and approval triggers.

Operating limits are the first safety fence
Figure: The common baseline is VLOS, height control, separation from people and clear approval triggers when the job leaves normal conditions.
Most remote pilots remember the headline rules: keep the aircraft in visual line of sight, stay under the normal height limit, keep away from people, avoid prohibited or restricted areas unless authorised, and do not interfere with emergency operations. Those rules are not trivia. They are the first safety fence. When a job cannot fit inside them, the operation needs a different approval path, a different procedure or a no-go decision.

VLOS means more than seeing a dot
Visual line of sight means the remote pilot, or the crew using approved procedures, can maintain direct visual awareness of the aircraft and its surroundings. A tiny dot at the edge of perception is not useful control.
The pilot needs enough visual information to know aircraft orientation, position, movement, proximity to obstacles, other aircraft risk and whether the planned flight path remains safe.
- Do not rely on the screen alone for VLOS.
- Use observers deliberately, with a shared communication plan.
- Stop or recover early when haze, sun angle, distance or background clutter makes orientation uncertain.

Height is measured from the surface below

CASA’s headline drone rules use 120 m, or 400 ft, above ground level as the normal maximum height for many operations. The practical point is that height is referenced to the ground or surface below the aircraft, not simply the launch point.

Terrain, structures and job geometry can make this harder than it looks. A mapping run from a hill, a tower inspection or a job near rising terrain needs careful planning so the crew understands the actual height above the surface throughout the flight.

People and populous areas are not the same check

Figure: The people picture is dynamic. If people move into the operating area or recovery path, the plan needs to change.

Keeping clear of people is a direct separation problem. A populous area is a broader risk question: would an uncontrolled crash create an unreasonable risk to the life, safety or property of someone in the area?

A beach, road, park, worksite, school, event space or built-up area can change quickly. The safe plan is to define the operating area, control access, monitor movement and stop when the people picture no longer matches the briefing.

- Do not fly over people who are not part of the operation unless the operation is specifically authorised and controlled for that risk.
- Keep uninvolved people outside the operating area and recovery path.
- Reassess if pedestrians, vehicles or workers enter the area.
- Treat a site as dynamic, not frozen at the time of the first briefing.

BVLOS, EVLOS, night and special work need a different pathway

BVLOS, extended visual line of sight, night operations, operations near or over people, operations in controlled or restricted airspace, and operations above the normal height limit are not just advanced techniques. They are approval and procedure questions.

For a RePL learner, the key is recognising the trigger. If the job leaves the baseline, pause and identify which approval, operator procedure, risk assessment, equipment, crew role and record is required before the aircraft flies.

Do not fly through emergency response activity

Drone operations must not interfere with police, fire, ambulance, search and rescue or other emergency response activity. The safest plan is to build a simple trigger into every briefing: if emergency aircraft or emergency services activity appears, recover or hold clear and reassess.

This is also a good example of why current-source thinking matters. The legal rule, the local situation and the operator procedure all need to line up before the operation continues.

Make the go/no-go decision explicit

A legal limits check should end in a plain decision. The crew should be able to say whether the operation is inside the baseline rules, which approval pathway applies if it is not, and what operating limits have been briefed.

If that sentence cannot be written clearly, the operation is not ready. More flying skill will not fix an unclear authority or risk position.

Practice: What does VLOS require in practical terms?
Answer: Enough direct visual awareness to manage position, orientation, movement and nearby hazards.
VLOS is about useful visual control and awareness, not merely knowing that the aircraft exists somewhere in the sky.

Practice: Why can the 120 m / 400 ft height limit require planning around terrain?
Answer: Because the normal limit is referenced to the ground or surface below the aircraft.
Terrain changes can affect the aircraft's height above ground level during the flight.

Practice: What is the safe response if uninvolved people enter the operating area?
Answer: Reassess, hold, recover or stop until the people risk is controlled.
People separation is dynamic. The operation must respond when the site changes.

Practice: What should a remote pilot recognise about BVLOS, night or operations above the normal height limit?
Answer: They are approval and procedure triggers, not just flying techniques.
When a job leaves baseline conditions, the pilot must identify the correct approval, procedure, risk control and record before flight.

RAFM: Automation Limits and Failure Modes
Status: current
Source: RePL Study Guide pp. 151-183; Part 101 MOS C10 p. 107.
Automated flight reduces workload only when the remote pilot understands its limits, setup risks and degraded modes.

Automation still needs a pilot
Figure: Automated flight is a loop of planning, verification, monitoring and intervention, not a set-and-forget mode.
Automated flight management can improve repeatability, mapping quality and crew workload, but it also introduces setup risk. Wrong height, wrong home point, wrong geofence, wrong mission direction or bad GPS can create a problem before the aircraft moves.
A remote pilot should understand what the aircraft will do when GPS degrades, the IMU fails, thrust is lost or the planned route becomes unsafe.

Program, verify, brief
Treat the mission file as an operational control. Check the route, height references, obstacle environment, battery margin, failsafe settings and recovery options before launch.
- Check the mission direction, altitude reference and terrain clearance.
- Check geofence, maximum height, return-to-home height and home-point behaviour.
- Brief who will monitor the aircraft, who will monitor the app and who will call stop.

Automation can hide mode confusion

Figure: Automation is safer when the pilot can say: current mode, next action, failsafe behaviour and interrupt method.

Automated systems often have multiple modes: position hold, waypoint, terrain follow, return-to-home, active track, manual, attitude or degraded modes. The aircraft may be doing exactly what it was told, while the pilot believes it is doing something else.

Mode awareness is therefore a critical skill. The pilot should know the active mode, the next programmed action and the quickest safe way to pause, hold, return or take manual control.

Faults must be identified early

Automation depends on sensors and data. GPS loss, IMU failure, compass disagreement, barometer error, obstacle sensor limitation, payload issue or weak link can all degrade the mission.

The pilot should understand both the alert and the aircraft response. A warning that seems minor on the screen may be the first sign that the mission no longer has the margin it started with.

- Know which warnings require immediate recovery.
- Know which modes remain available after GPS or sensor degradation.
- Do not push deeper into a mission when the aircraft is already telling you the system is degraded.

Emergency behaviour is part of the setup

Automated emergency behaviour should be planned, not discovered. Loss of control, loss of thrust, lost link, low battery, geofence breach and obstacle conflict all need known responses.

Return-to-home may be safe in one site and dangerous in another if it climbs into controlled airspace, heads toward people, crosses an obstacle or lands in the wrong area. The setup must match the actual job.

Precautions before pressing start

Before starting an automated mission, the crew should verify the map, route, heights, battery, payload, wind, obstacle environment, failsafe settings and abort method. The pilot should be ready to intervene from the first second.

Automation is at its best when it makes a well-planned operation repeatable. It is at its worst when it hides a bad plan behind a confident-looking route line.

Practice: What is a good habit before launching an automated mission?

Answer: Verify route, height, failsafes and recovery options.

Automation reduces some workload but makes pre-flight configuration and verification more important.

Practice: Why is mode awareness important during an automated mission?

Answer: The pilot must know what the aircraft is doing now and what it will do next.

Mode confusion can lead to late or incorrect intervention, especially during automated flight.

Practice: What should be considered when setting return-to-home for an automated mission?
Answer: Home point, height, obstacles, airspace, wind, battery and landing area.
Return-to-home behaviour must suit the site and operation; otherwise the failsafe can create a new hazard.

Practice: A GPS warning appears during a waypoint mission. What is the safest general response?
Answer: Treat the mission as degraded and move toward a safe hold, manual control or recovery option.
Automation depends on reliable sensors. Degraded navigation should trigger conservative recovery thinking.

RAFM: GNSS, Compass and Sensor Reliability
Status: current
Source: RePL Study Guide pp. 151-160; Part 101 MOS C10 pp. 97-99 and 107; CASA AC 101-01 v6.1 and AC 101-03 v2.0 checked 2026-05-19.
Understand how GNSS, compass, IMU and telemetry inputs can mislead automation, and how to cross-check them before trusting GPS hold, RTH or waypoint flight.

Automation listens to sensors before it listens to you
Figure: Automation is trustworthy only when the inputs agree and the pilot can still intervene.
GPS hold, waypoint flight, return-to-home and many safety features depend on the aircraft’s sensor picture. If that picture is wrong, the aircraft may confidently do the wrong thing.
The remote pilot’s job is to cross-check the inputs before trusting the automation: position, heading, attitude, mode state, warnings and what the aircraft is actually doing in the sky.

GNSS position depends on satellite geometry and clean signals
GNSS receivers estimate position from satellite signals. Accuracy depends on satellite geometry, receiver quality, antenna placement, signal strength, obstruction and the local environment.
A high satellite count is useful, but it is not the whole story. A receiver can still be affected by poor geometry, reflections, blockage or interference, especially near structures or terrain.

Multipath creates false confidence
Figure: Multipath can make the aircraft’s position estimate look confident while being wrong enough to matter.
Multipath occurs when satellite signals bounce off buildings, metal structures, vehicles, terrain or other reflective surfaces before reaching the receiver. The aircraft may receive both direct and reflected signals and calculate a position that is offset or unstable.
Remote pilots see this as drifting position hold, position jumps, poor mapping

alignment, unexpected RTH behaviour or warnings that appear when flying near structures.

Compass interference changes the aircraft's idea of heading

Figure: A clean launch point keeps heading errors out of the aircraft before take-off.

A compass gives heading information. It can be affected by magnetic fields from vehicles, reinforced concrete, steel structures, magnets, power infrastructure, payloads, batteries, cables and electrical equipment.

A poor compass environment can create toilet-bowling, yaw errors, incorrect RTH direction, unstable position hold or mode warnings. Calibration does not fix a bad launch location; sometimes the correct answer is to move.

IMU and barometer errors affect attitude and height confidence

The IMU helps the aircraft understand attitude and motion. Barometric and height systems help it estimate vertical movement. Vibration, shock, temperature, poor calibration or sensor disagreement can all reduce confidence.

The pilot may see this as poor hover stability, drifting height, unusual vibration warnings, inconsistent speed or mode limitations. Treat those signs as evidence, not as background noise.

Cross-check before relying on GPS hold or RTH

Before relying on GPS hold, return-to-home, geofence or waypoint flight, check whether the sensor picture is coherent. The map position should match the real site. The heading should match the aircraft orientation. The active mode should match the pilot's expectation. Telemetry should be free of unresolved warnings.

If the inputs do not agree, keep the aircraft close, simplify the operation, use the approved manual or degraded-mode procedure, and recover while there is still margin.

- Check home point, satellite/GNSS quality, heading, mode and warning state before take-off.
- Do not launch from vehicles, reinforced concrete, metal covers or obvious magnetic interference sources.
- Avoid pushing deeper into a task when position, heading or telemetry confidence is degrading.

Bad inputs can make good automation unsafe

Automation may behave perfectly according to bad inputs. A return-to-home using a wrong home point, wrong height, poor heading or unstable position can create a new hazard instead of solving the original one.

The safe mindset is simple: when the sensor picture becomes doubtful, the operation has changed. Recover, hold, relocate or move to an approved degraded-mode response before the aircraft decides for you.

Practice: Why can automation become unsafe when sensors are unreliable?

Answer: It may confidently act on wrong position, heading or mode information.

Automated modes depend on sensor inputs. Bad inputs can make a correct algorithm produce unsafe behaviour.

Practice: What is GNSS multipath?
Answer: Satellite signals reflecting off structures or terrain before reaching the receiver.
Reflected signals can make the receiver estimate an inaccurate or unstable position.

Practice: What is a good response to repeated compass or heading warnings before launch?
Answer: Stop, investigate the site and aircraft, and move away from likely interference sources.
Compass problems often come from the local environment, and calibration does not make a poor launch site safe.

Practice: What should a pilot cross-check before trusting return-to-home?
Answer: Home point, position quality, heading, RTH height, obstacles, mode and warnings.
RTH relies on several assumptions. Each needs to match the site and aircraft state.

RBKM: Multirotor Components and Vortex Ring Awareness
Status: current
Source: RePL Study Guide pp. 142-183; Part 101 MOS C10 pp. 111-113.
Connect multirotor hardware, lift, control response and descent hazards into one practical operating picture.

A multirotor is simple to fly until margins shrink
Figure: A multirotor is a flying system of structure, power, sensors, flight control and radio link.
Modern stabilisation can make a multirotor feel easy, but the pilot still needs to understand motors, arms, battery mounting, GPS, flight controller behaviour and how weight, power, ground effect and wind change performance.
Descent planning matters. A steep vertical descent in disturbed rotor airflow can lead toward vortex ring state, especially with little horizontal movement and high power demand.

Know the components and what they do
The centre body, arms, motors, motor mounts, landing gear, battery mount and payload fittings carry the loads. The ESCs, receiver, antennas, IMU, flight controller, GPS and battery make the aircraft controllable.
Component knowledge is practical. A cracked arm, loose motor, damaged antenna, shifting battery or poor GPS installation can change the flight before the pilot sees a clear warning.
- Inspect arms, mounts, propellers, landing gear, battery retention and payload attachment.
- Check antennas and GPS/compass areas for damage or interference risks.
- Treat unfamiliar vibration, noise or control response as a reason to land and inspect.

Weight, power, ground effect and wind change performance
Figure: Weight and balance are not only loading concepts. They change how much thrust and control margin the multirotor has.

More weight means more thrust is needed to hover, climb and stop descent. Less power margin means the aircraft has less spare control authority when wind, heat, altitude or payload demand increases.
Ground effect can make a multirotor feel more efficient close to the surface, but that help fades with height. Wind can improve or degrade the recovery and landing picture depending on direction, turbulence and available space.

Rotor blades make lift, drag and torque
Figure: A multirotor propeller is a rotating aerofoil: thrust, drag, airflow and torque all matter.
A rotor blade is an aerofoil. Blade shape, twist and taper help create useful thrust across a spinning disc where the inner and outer parts of the blade move at different speeds.
The pilot does not directly feel rotor thrust or torque, but they see the result as hover performance, yaw authority, climb response and control margin.

Hovering and forward flight are different airflow problems
In a hover, the aircraft is working in a mostly vertical airflow pattern. In forward flight, the rotor disc meets cleaner air and the aircraft also deals with drag from the frame and payload.
This is why a multirotor can feel different when it transitions from hover to forward flight, turns downwind, or descends near obstacles and turbulent air.

Controls move the aircraft around three axes
Figure: Multirotor control inputs still move the aircraft around roll, pitch, yaw and vertical axes.
Roll, pitch, yaw and throttle commands are translated by the flight controller into motor-speed changes. Stabilisation and GPS hold can make this feel simple, but the pilot should still understand what the aircraft is trying to do.
If GPS hold is unavailable, wind and inertia become more obvious. If stabilisation is degraded, the pilot may need a much simpler recovery plan.

Launch and climb are performance checks
Pre-launch checks confirm that the aircraft, crew, site and airspace are ready.
Post-launch checks confirm that the aircraft is actually performing as expected before it moves away from the recovery area.
Climb performance is affected by weight, power, airspeed, wind, bank angle, temperature and altitude. A slow climb or unexpected drift early in the flight is useful information, not something to ignore.

Turns and descents need margin
Banked turns, flat turns and steep manoeuvres all have limits. The tighter the area and the stronger the wind, the more important it is to slow down and leave space for correction.
Descending, landing and recovery should be planned into wind where appropriate and with enough horizontal and vertical margin to avoid disturbed airflow, obstacles and rushed

control inputs.

Recover by changing the airflow problem
Figure: Avoid long vertical descents through your own disturbed airflow; recover by changing the airflow problem early.
The practical idea behind vortex ring recovery is to leave the disturbed column of air. That normally means reducing the vertical descent condition and moving laterally or forward as appropriate for the aircraft and environment.
- Avoid steep vertical descents with little horizontal movement.
- Keep enough height and lateral room for recovery.
- Use the manufacturer’s recovery guidance and operator procedures for the aircraft in use.

Abnormal multirotor behaviour needs early action
Incorrect propeller installation, motor failure, ESC failure, GPS loss, IMU disagreement, loose payload or structural damage can all create abnormal behaviour. Stabilisation may mask the early signs until the margin is already shrinking.
If the aircraft yaws unexpectedly, will not hold position, vibrates abnormally, climbs poorly or shows repeated warnings, simplify the task and recover while the aircraft is still controllable.

Practice: Why can a straight vertical descent be risky for a multirotor?
Answer: It can keep the aircraft in disturbed rotor airflow and increase vortex ring risk.
Descending through disturbed rotor airflow can reduce control margin and requires proper recovery technique.

Practice: Why are post-launch checks important for a multirotor?
Answer: They confirm the aircraft is responding normally before it leaves the recovery area.
A short controlled check after launch can reveal performance, control or sensor problems early.

Practice: Which condition can reduce multirotor climb performance?
Answer: Increased weight, reduced power margin, high temperature or higher altitude.
Climb performance depends on available thrust and environmental conditions.

Practice: What is a practical warning sign of abnormal multirotor operation?
Answer: Unexpected yaw, vibration, poor position hold or repeated system warnings.
Abnormal behaviour should trigger early recovery and inspection.

RBKM: Propulsion, Telemetry and Failsafe Checks
Status: current
Source: RePL Study Guide pp. 166-183; Part 101 MOS C10 pp. 111-113; CASA AC 101-03 v2.0 Appendix C checked 2026-05-19.
Connect propellers, motors, ESCs, telemetry warnings and failsafe settings into

practical pre-flight and in-flight decisions.

Propulsion is a chain, not a single component

Figure: A failsafe decision depends on healthy propulsion, reliable telemetry and a command link that has been checked before flight.

A multirotor produces lift through a connected chain: battery, power distribution, ESCs, motors, propellers, flight controller commands and the aircraft structure holding everything in alignment.

A problem anywhere in that chain can look like poor climb, vibration, unexpected yaw, unstable hover, unusual noise, motor warning, hot components or a sudden loss of control margin.

Propellers are small aerofoils under high load

Figure: A propeller is a rotating aerofoil. Damage, wrong fitment or vibration changes the whole aircraft.

Propellers create thrust by accelerating air. Their condition matters: chips, cracks, deformation, incorrect fitment, wrong rotation, loose hubs or contamination can create vibration and reduce thrust.

The propeller check is not cosmetic. A damaged or incorrectly installed propeller can overload motors and ESCs, confuse sensors through vibration and leave the aircraft with too little control margin when it matters.

Motors and ESCs turn battery energy into control authority

The ESC controls motor speed in response to the flight controller. The motor and propeller then produce the thrust needed for lift, attitude control and recovery.

High current, poor cooling, damaged cables, loose connectors, worn bearings, contamination, water ingress or overheating can reduce reliability. CASA’s model-aircraft guidance also notes that current flows in battery-controller-motor setups can be extremely high and that cables and connectors need to be in good order.

- Check motor security, free rotation, abnormal noise and heat.
- Check ESC warnings, wiring, connectors and signs of overheating.
- Do not ignore vibration, repeated motor errors or unexplained yaw.

Telemetry warnings are early decision points

Telemetry gives the remote pilot battery state, link quality, GPS health, mode state, height, distance, warnings and aircraft behaviour cues. It is only useful if the pilot notices it early and responds conservatively.

A warning is not a suggestion to press on until the job is finished. Battery sag, weak link, compass disagreement, motor load, excessive wind or GPS health warnings should push the crew toward simpler tasks, better link geometry or recovery.

Return-to-home is not a magic button

Return-to-home depends on aircraft configuration, home point accuracy, GNSS quality, height setting, obstacle environment, wind, battery state and command-link logic. If any of those assumptions are wrong, the automated recovery may create a new problem.

Before launch, the crew should confirm what the aircraft will do for loss of command link, low battery, critical battery, GNSS degradation, geofence boundary and manual RTH activation.

Failsafe choices must match the site
Hover, land, return-to-home, hold, terminate and parachute options have different consequences. The best option depends on people, obstacles, water, roads, controlled airspace, wind, terrain, structures and the aircraft's actual position.
A suitable failsafe in an open paddock may be unsuitable beside a road, under a bridge, near a crowd or inside a constrained industrial site.
- Check home point and RTH height before take-off.
- Confirm geofence and maximum-distance settings match the job.
- Brief what the crew will do if automation behaves differently from expectation.

Pre-flight checks should include a controlled behaviour check
A safe launch is not complete when the aircraft leaves the ground. A brief controlled hover and response check can reveal vibration, drift, poor position hold, sensor disagreement, abnormal noise or unexpected control response before the aircraft moves away.
If the aircraft does not feel or look right, land and inspect. The cheapest time to solve a propulsion or telemetry problem is while the aircraft is still close and controllable.

Practice: Why is a damaged propeller more than a cosmetic issue?
Answer: It can create vibration, reduce thrust and stress motors or ESCs.
Propeller damage can affect lift, vibration, component load and aircraft controllability.

Practice: What should repeated telemetry warnings usually trigger?
Answer: A conservative decision such as recovery, investigation or simplifying the task.
Telemetry warnings are early signals that the aircraft may be losing operating margin.

Practice: Why must return-to-home settings be checked before launch?
Answer: RTH depends on home point, height, GNSS, battery, wind and obstacle assumptions.
Automated recovery is only safe if the assumptions behind it suit the site and aircraft state.

Practice: What is the value of a controlled hover check after take-off?
Answer: It can reveal abnormal vibration, drift, noise or control response while the aircraft is still close.
Post-launch checks catch problems while recovery is still simple.

AROC: Radio Calls, Readability and Emergencies
Status: current
Source: RePL Study Guide pp. 278-316; CASA AC 101-01 v6.1.
Build the radio habits remote pilots need when operating around aviation traffic and controlled procedures.

Radio is for concise shared awareness

Figure: A good radio call is planned before the transmit button is pressed.

Aeronautical radio is not a casual conversation channel. It is a disciplined way to make position, intention, traffic and emergency information understandable to other airspace users.

A remote pilot should know the relevant frequency, listen before transmitting, use standard phraseology and keep calls short enough that other traffic can use the channel.

Radio waves are line-of-sight limited

Figure: Radio range depends on line of sight, height, obstructions and antenna setup.

VHF aeronautical radio is mainly line of sight. Height, terrain, antenna placement, aircraft attitude and obstacles all affect whether another station can hear you.

A handheld or remote pilot station radio may not perform like an aircraft-mounted radio. The operator should understand the equipment, battery state, antenna orientation and range limitations before relying on it.

Listen first, then make the call useful

Before transmitting, listen to avoid stepping on another call. Then keep the message relevant: who you are calling, who you are, where you are, what you are doing and what you need.

Unnecessary radio traffic can hide important traffic calls. Long or vague calls also increase workload for other airspace users.

- Use standard phraseology and plain numbers.
- Avoid slang and long explanations on frequency.
- If uncertain, pause and prepare the message before transmitting.

CTAF calls build shared traffic awareness

Figure: CTAF calls are about shared awareness: position, intention and traffic risk.

A CTAF is used so nearby aircraft can build a shared picture of traffic and intentions.

A remote pilot operating in an environment where radio is required or operationally necessary should make calls that help other pilots understand where the RPA is and what it is doing.

The call should match the operation. A drone at low level near an aerodrome has different information value from a crewed aircraft in the circuit, but both need to understand each other’s position and intention.

Clarity matters under pressure

Figure: Radio standards exist so urgent messages remain understandable when workload rises.

The phonetic alphabet, standard numbers, readability scale, Mayday and Pan Pan formats exist so messages survive stress, noise and time pressure.

If a radio call is needed, plan what you need to say before pressing transmit: who you are calling, who you are, where you are, what you are doing and what you need.

Readability and readback protect the message

The readability scale helps a station report how well a transmission can be heard.
Readback confirms critical information has been received correctly, especially when instructions, frequencies, locations or emergency details matter.
If a message is unreadable, do not pretend it was understood. Ask for it again or use an approved alternate communication path if the operation allows it.

Mayday and Pan Pan are not ordinary calls

Mayday is used for distress where there is grave and imminent danger requiring immediate assistance. Pan Pan is used for urgency where safety is affected but the situation is not yet distress.
For remote pilots, the exact operational context matters: risk to people, other aircraft, property, airspace, control link, battery state, aircraft position and the ability to recover safely.

Good radio discipline starts before the job

Radio use should be planned in the job pack: frequency, callsign or station identification, expected calls, emergency calls, backup communication and who is responsible for listening and transmitting.
The radio should be checked like other operational equipment: charged, configured, volume set, frequency confirmed and usable at the site.

Practice: What should a pilot do before making a radio transmission on an aviation frequency?
Answer: Listen first and make a concise, relevant call using standard phraseology.
Listening and concise phraseology reduce channel congestion and improve shared situational awareness.

Practice: Why should a remote pilot listen before transmitting?
Answer: To avoid blocking another transmission and to build traffic awareness.
Listening first reduces channel congestion and helps the pilot understand current traffic.

Practice: What is the difference between Mayday and Pan Pan in broad terms?
Answer: Mayday is distress; Pan Pan is urgency.
Standard urgency and distress words help other stations understand the seriousness of the situation.

Practice: What should a pilot do if an important radio message is unreadable?
Answer: Ask for the message again or use an approved alternate communication path if available.
Critical communication should be confirmed rather than guessed.

AROC: Radio Fundamentals, Responsibilities and Phraseology
Status: current
Source: RePL Study Guide pp. 278-306; CASA radio operators guidance checked 2026-05-19; CASA AC 101-01 v6.1.

Understand when an AROC is needed, how aviation radio is used, and how phraseology, readability, numbers and time keep calls clear.

AROC is authority to use the aviation radio

An Aeronautical Radio Operator Certificate is required for a person who needs to communicate on an aviation air-band radio frequency and is not already qualified another way. CASA's current radio-operator guidance specifically includes remote pilot licence holders among the people who may need an AROC.

For a remote pilot, the important study habit is to separate flying authority from radio authority. A RePL may authorise remote-pilot privileges, but the operation may also require an AROC, an approved procedure, the correct frequency and disciplined radio use.

- Check whether the operation needs radio communication before the job starts.
- Use current CASA, ERSA, chart and operator sources for frequency and procedure checks.
- Do not treat radio use as optional if the operation or airspace requires it.

Frequency choice comes from current operational sources

A remote pilot should not guess a frequency from memory. Frequencies, CTAF details, controlled-airspace requirements and local procedures must be checked from current operational sources and the operator's approved procedures.

The radio plan should be briefed in plain terms: which frequency is used, who monitors it, who transmits, what calls are expected, what backup communication exists and what happens if the radio becomes unusable.

VHF radio is mostly line of sight

Figure: Radio performance depends on line of sight, obstructions, antenna setup and equipment condition.

VHF aviation radio usually behaves like a line-of-sight system. Terrain, buildings, aircraft height, antenna orientation, handheld-radio position and battery state can all affect whether another station can hear the call.

That is why a radio check and equipment check belong in the job preparation, not after the aircraft is airborne and workload is already high.

Listen first, then transmit a useful call

Figure: A concise call usually follows the same logic: who you call, who you are, where you are and what you intend.

Good radio discipline begins with listening. The pilot should build a mental traffic picture before transmitting and avoid blocking another station.

A useful aviation call is short and structured. It normally tells listeners who is being called, who is transmitting, where the aircraft or operation is, and what the pilot intends to do.

Phraseology reduces interpretation work

Standard phraseology exists because aviation radio is often noisy, busy and time-sensitive. It lets different pilots, controllers and operators understand each other without inventing wording on the spot.

For study, focus on intent rather than theatre. The goal is not to sound dramatic. The

goal is to be accurate, brief and predictable so other airspace users can act on the information.
- Use the phonetic alphabet for letters, callsigns and spelling when clarity matters.
- Speak numbers and times slowly enough to be written down.
- Avoid jokes, slang and long explanations on an aviation frequency.

Readability is a safety signal

The readability scale gives a quick way to report how well a transmission is being received. If a critical call is unreadable or only partly readable, the safe response is to ask again or use an approved alternate communication path.

Never pretend a message was understood. Guessing an instruction, frequency, position or emergency detail can create a larger problem than asking for clarification.

Numbers and time need extra care

Numbers carry operational meaning: height, distance, runway direction, frequency, time, position and callsign details. They should be spoken clearly and checked back when required by procedure.

Use UTC and date-time group habits where the operation requires them. If local time is used for an internal job note, make sure the team knows exactly which time reference applies.

Practice: What does an AROC broadly authorise?

Answer: Use of an aviation air-band radio frequency by a person who needs that qualification.

AROC is radio authority. It does not replace pilot, operator or airspace approvals.

Practice: Where should a remote pilot confirm the correct frequency for a job?

Answer: Current operational sources and the operator’s approved procedures.

Frequency and procedure information must be current and relevant to the operation.

Practice: What should happen before transmitting on an aviation frequency?

Answer: Listen first and prepare a concise, useful call.

Listening first helps avoid blocking other calls and improves traffic awareness.

Practice: Why is standard phraseology useful?

Answer: It makes calls predictable and reduces misunderstanding.

Predictable wording helps listeners understand calls under workload, noise or time pressure.

AROC: Sample Calls, Emergencies and Lost Communications

Status: current

Source: RePL Study Guide pp. 292-316; CASA radio operators guidance checked 2026-05-19; CASA AC 101-01 v6.1.

Practise public, non-exam-bank call flows for CTAF-style operations, position reports, urgency, distress and lost communications.

Sample calls are patterns, not scripts to memorise blindly

A sample call helps a remote pilot practise the structure of a transmission, but it must still match the real operation. The correct station, callsign, position, altitude or height, intention and traffic context come from the job and current procedures.

The examples in this guide are public study patterns. They are not CASA exam-bank questions and they do not replace an approved operator procedure, current ERSA entry, air traffic instruction or aviation reviewer guidance.

A normal traffic-awareness call has a simple shape

Figure: Use the call sequence as a thinking aid, then fit it to the real procedure and operation.

For CTAF-style traffic awareness, the useful shape is: station being called, who you are, where you are, what you are doing and any operational limit that helps other traffic understand the risk.

For example, a remote crew might prepare a call pattern such as: local traffic, drone team identification, operating location relative to a known point, maximum height, time or duration, and intention to remain clear of circuit traffic. The exact wording must be reviewed against current procedures before operational use.

Position reports should help another pilot find the risk

A position report is only useful if it lets another pilot picture the operation. For drone work, that may include distance and direction from an aerodrome or feature, maximum operating height, whether the RPA is stationary or moving, and whether the crew will remain in a defined area.

Avoid vague calls such as near town or around the paddock when another airspace user needs a clear mental picture. Use the reference points and wording approved for the operation.

Readback and clarification stop small errors becoming large ones

When a message contains critical information, the receiving station may need to read it back or confirm it. This is especially important for frequencies, instructions, positions, emergency details or any coordination that affects separation.

If the message is not clear, say so. Asking for a repeat is good discipline; guessing is not.

Pan Pan is urgency; Mayday is distress

Figure: Emergency radio calls should be short, structured and repeated if needed.

Pan Pan is used for an urgency condition where safety is affected but the situation is not yet distress. Mayday is used for distress where there is grave and imminent danger and immediate assistance is required.

For remote pilots, the decision should consider risk to people, crewed aircraft, property, airspace, aircraft control, battery state, flyaway risk and whether the RPA can be recovered safely.

An emergency call should answer who, where, what and need

A useful emergency transmission identifies who is calling, where the problem is, what is happening and what assistance or action is needed. If time permits, include information that helps other airspace users avoid the area or understand the hazard.

Keep the message plain. A remote pilot dealing with loss of control, flyaway, battery emergency or collision risk does not need a long speech. They need a call that helps others act.

Lost communications should have a pre-briefed plan

Lost communications can mean the aviation radio has failed, the crew cannot hear another station, the control-link situation is degraded, or the team has lost its normal internal coordination path. Each case needs a plan before launch.

The job brief should state who stops the operation, how the aircraft is recovered, what backup communication is available, who notifies the operator, and what post-flight reporting is required.

- If the required radio capability is lost before flight, do not launch until the operation is made compliant and safe.
- If required radio capability is lost during flight, recover or terminate according to the approved procedure.
- Record the event if operator procedures or safety reporting requirements require it.

Emergency practice should feel boring before it is needed

A pilot should not be inventing emergency phraseology during the emergency. Practise the call structure during training, rehearse who talks, and keep the radio notes accessible in the job pack.

A picture can still do the heavy lifting here. A simple call-flow diagram in the briefing pack can save a lot of thinking when workload rises.

Practice: What is the best way to use a sample radio call in study?
Answer: As a structure that must be adapted to the real operation and current procedure.
Sample calls teach structure, but real calls must fit the current operation and approved procedure.

Practice: What should a useful position report help another pilot do?
Answer: Picture where the RPA operation is and what risk it creates.
Position reports support traffic awareness only when they help others locate the operation.

Practice: When is Mayday broadly appropriate?
Answer: For distress involving grave and imminent danger requiring immediate assistance.
Mayday is a distress call and should not be treated as ordinary radio traffic.

Practice: What should happen if required radio capability is lost during a flight?
Answer: Recover or terminate according to the approved procedure and report as required.
Loss of required communication is an operational control issue and should trigger the planned response.