CHAPTER 3
FLYING YOUR AIRCRAFT

Visual flight rules (CASR 91.270)

An aircraft may only be flown under either the VFR or IFR.

A Part 103 aircraft may only be flown by day under the VFR.

A Part 131 aircraft may only be flown under the VFR.

VFR flight navigation requirements

(CASR 91.273) (MOS 13.02)

When navigating by visual reference to the ground or water, you must positively fix the aircraft's position by visual reference to features marked on topographical charts at intervals not exceeding 30 minutes.

When navigating by visual reference over the sea, visual reference features may include rocks, reefs and fixed human-made objects marked on topographical charts and readily identifiable from the air.

When you are not navigating by visual reference to the ground or water, you must comply with the requirements of IFR flight (CASR 91.287 MOS 14.02) as if the flight were an IFR flight. You must be competent (under Part 61 – flight crew licensing) to use any IFR navigation techniques and any IFR navigation equipment, such as a global navigation satellite system (GNSS).

You may fly in airspace, on a route, or fly a terminal instrument procedure – where a minimum navigation performance value is specified – provided the aircraft is approved for flight under that navigation specification by:

- the aircraft flight manual (AFM), or
- a document approved under CASR Part 21 based on an airworthiness assessment, or
- for a foreign-registered aircraft, a document approved in writing by the national aviation authority (NAA) of the state of registration or state of the operator of the aircraft.

In addition, any global navigation satellite system (GNSS) equipment is required to be approved, including where a GNSS is used as a substitute or alternative for any ground-based navigation aid within the meaning of CASR 91 MOS 14.05.

During flight you must maintain a time reference accurate to within 30 seconds (ENR 1.1).

Note: Flight above more than scattered (SCT) cloud, or over featureless land areas, or sea, may make visual navigation impracticable.

Note: In Australia, only man-made obstacles above 360 ft are required to be reported and these are only shown on aeronautical maps and charts where they are required for navigation purposes.

Position fixing with navigation aids (NAVAIDs)

A positive radio fix is one that is determined by the passage of the aircraft:

- over a non-directional beacon (NDB)
- over a VHF omni-directional radio range (VOR)
- over a tactical air navigation aid (TACAN)
- over a marker beacon
- over a distance measuring equipment (DME) site
- via the intersection of two or more position lines which intersect with angles of not less than 45° and which are obtained from NDBs, VORs, localizers or DMEs in any combination, or
- with reference to GNSS meeting the equipment requirements of AIP GEN 1.5.

VFR flights speed limitation (CASR 91.283)

You must not fly an aircraft operating under the VFR at a transonic or supersonic speed.

Determination of visibility for VFR (CASR 91.280)

You may only fly an aircraft under the VFR in accordance with the visual meteorological conditions (VMC) criteria for the aircraft and airspace in which you are flying.

***Exception:** This requirement does not apply if you have a clearance from ATC to conduct the flight under the special VFR and you comply with the special VFR.*

It is your responsibility to determine that you can maintain VMC flight criteria (MOS 2.07) from the cockpit while in flight.

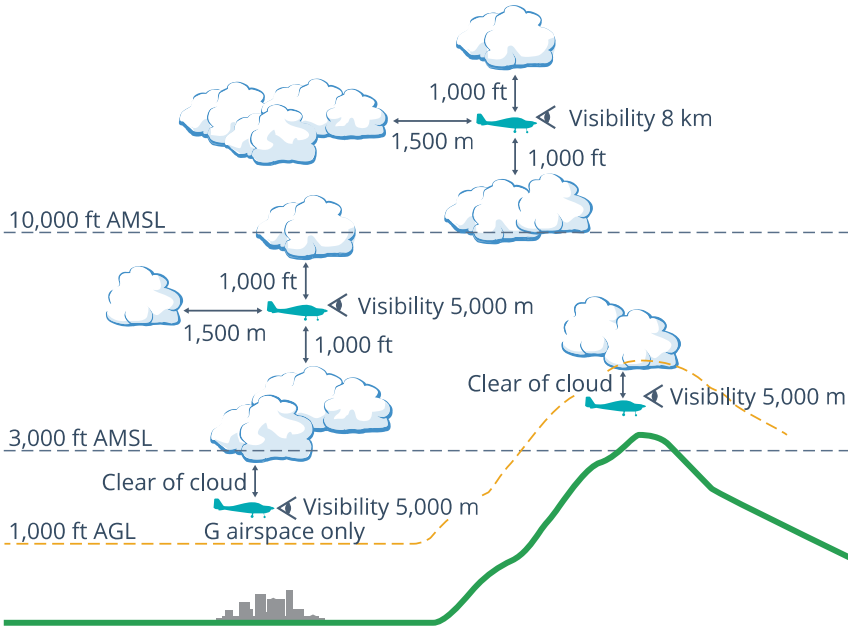
In determining visibility it is recommended you consider, sun glare, smoke haze or rising dust and any other condition that may limit your effective vision.

For a VFR flight you must not take off in weather where the cloud and visibility are less than the VMC criteria.

Visual meteorological conditions (CASR 91.280) (MOS 2.07)

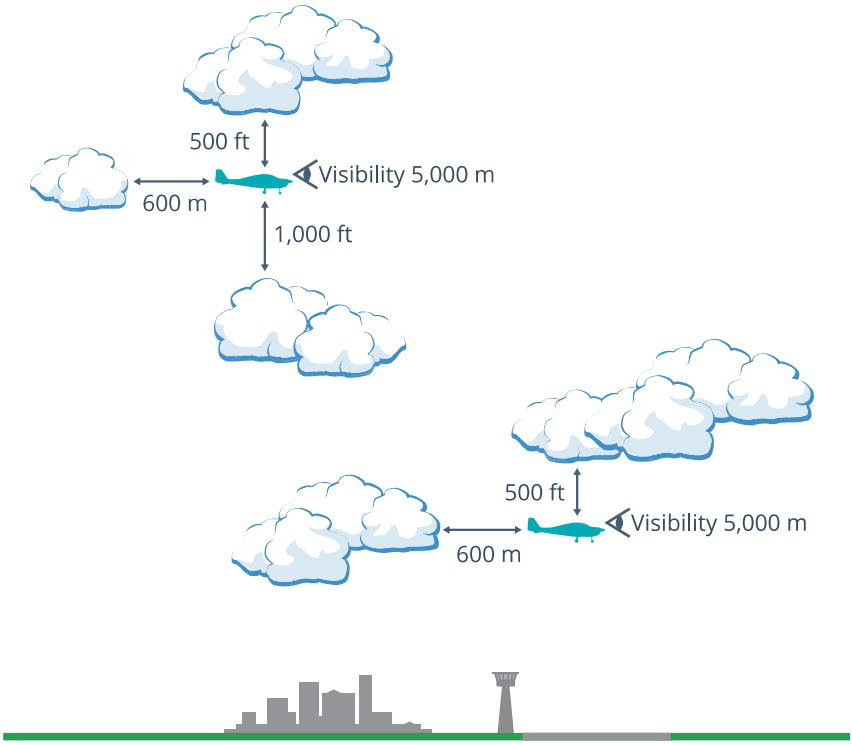
VMC criteria means, the meteorological conditions expressed in terms of flight visibility and the horizontal and vertical distance from cloud. See the following Figures for the application of VMC criteria in various airspace classifications.

Figure: VMC criteria all aircraft Class A, C, E and G



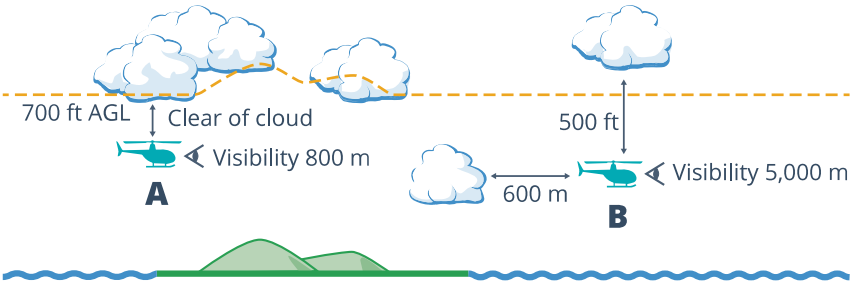
Class of airspace	Height	Flight visibility	Distance from cloud	Operational requirements
A, B, C, E or G	At or above 10,000 ft AMSL	8,000 m (8 km)	1,500 m horizontal 1,000 ft vertical	
A, B, C, E or G	Below 10,000 ft AMSL	5,000 m (5 km)	1,500 m horizontal 1,000 ft vertical	
G	At or below whichever is the higher of: 3,000 ft AMSL 1,000 ft AGL	5,000 m (5 km)	Clear of cloud	In sight of ground or water Radio must be carried and used on appropriate frequency

Figure: VMC criteria all aircraft for Class D controlled airspace



Class of airspace	Height	Flight visibility	Distance from cloud	Operational requirements
D	All heights	5,000 m (5 km)	600 m horizontal 1,000 ft vertical above cloud, 500 ft vertical below cloud	

Figure: VMC criteria for helicopter in Class G non-controlled airspace



A. Overland with/without track guidance or overwater with track guidance from navigation system.

B. Overwater without track guidance from navigation system.

Class of airspace	Height	Flight visibility	Distance from cloud	Operational requirements
G	**Helicopter A** Below 700 ft over land Below 700 ft over water with track guidance from navigation system	800 m	Clear of cloud	Applicable only if the helicopter is operated: › by day › at a speed that allows the pilot to see obstructions or other traffic in sufficient time to avoid collision, and › if within 10 NM of an aerodrome with an instrument approach, in a way that ensures the flight maintains separation of at least 500 ft vertically from any IFR aircraft that is also within 10 NM of the aerodrome.
	Helicopter B Below 700 ft over water without track guidance from navigation system	5,000 (5 km)	600 m horizontal and 500 ft vertical	

Special VFR (CASR 91 MOS 2.01)

By day, when VMC do not exist, the ATC unit responsible for a control zone (CTR) or control area (CTA), at your request may issue a 'special VFR clearance' for flight in the CTR, or in a CTA next to the CTR, for the purpose of entering or leaving the CTR, providing an IFR flight will not be unduly delayed.

When operating under a special VFR clearance you are responsible for ensuring that:

- the flight can be conducted clear of cloud
- the visibility is not less than
  - 1,600 m for aeroplanes
  - 800 m for helicopter, and you operate at such a speed that allows you adequate opportunity to observe any obstructions or other traffic in sufficient time to avoid collisions
  - for balloons, not less than 100 m below 500 ft AGL and not less than 1,600 m at or above 500 ft AGL.

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VFR flight above cloud (AIP ENR 1.1)

Flight above more than scattered (SCT) cloud, over featureless land areas, or over the sea, may preclude visual position fixing at the required intervals and may therefore make visual navigation impracticable.

- VFR flight on top of more than scattered cloud is available provided that:
  - VMC can be maintained during the entire flight, (including climb, cruise and descent)
  - you can meet the visual position fixing or IFR navigation requirements
  - you are sure that current forecasts and observations (including those available in flight) indicate that conditions in the area of and during the period of, the planned descent below the cloud layer will permit the descent to be conducted in VMC, and
  - the position at which descent below cloud is planned to occur must be such as to enable continuation of the flight to the destination and, if required, an alternate aerodrome in VMC (see note below).
- When navigating by reference to radio navigation aids or GNSS, you must obtain positive fixes at the intervals and by the methods prescribed in MOS 14.
- If you are wishing to navigate VFR by means of radio navigation systems or any other means you must indicate in the flight notification only those radio navigation aids with which the aircraft is equipped and that you are competent to use under (CASR 61.385).

Note: Pilots should not initiate VFR flight on top of more than SCT cloud when weather conditions are marginal. Before committing to operate VFR flight on top of more than SCT cloud, pilots should be confident that meteorological information used is reliable and current, and clearly indicates that the entire flight will be able to be conducted in VMC.

Inspections and briefings

Matters to be checked before take-off

(CASR 91.245) (MOS10.02)

Before take-off, you must complete the following checks:

- each aerodrome, air route and airway facility that you plan to use will be available for use
- all Head Office and flight information region (FIR) NOTAMs applicable to the en route phase of the flight have been consulted
- all location-specific NOTAMs for relevant aerodromes have been referred to
- the availability of global navigation satellite system (GNSS) integrity, if required by CASR 91 MOS 11.03 or MOS 14.06 has been confirmed
- all equipment required to be fitted to, or carried on the aircraft is available and functioning properly
- emergency and survival equipment carried on the aircraft are readily accessible
- that each crew member is fit to perform their duties
- the aircraft's hatches, access ports, panels and fuel tank caps are secured
- the control locks, covers and ground safety devices and restraints have been removed
- that if the aircraft is an Australian aircraft, there is either:
  - a certificate of release to service for the most recent maintenance carried out on the aircraft, or
  - a maintenance release for the aircraft
- that the aircraft's flight controls have been tested and are functioning correctly
- for each system fitted to the aircraft for measuring and displaying pressure altitude, the system's accuracy has been established in accordance with the procedures described in CASR 91 MOS 10.03 and MOS 10.04.
- that if an amount of supplemental oxygen or protective breathing equipment is required to be carried for a flight crew member, the following checks (as the case requires) have been made:
  - the required amount of supplemental oxygen is available
  - the protective breathing equipment is operative
  - the oxygen mask is connected to the supply terminal

» each communication system associated with the oxygen mask is connected to the aircraft's communication system

» if the oxygen mask is adjustable, the mask fits the flight crew member correctly.

Pilots should consider whether supplemental oxygen should be carried even if it is not required since hypoxia is insidious, and its onset is determined by many variables.

Electronic oximeters are available for personal use and may be useful for those who have not been trained in hypoxia symptom awareness (for example, experiencing hypoxia in a controlled setting such as in a hyperbaric chamber).

Pilots and operators should identify the requirements that must be addressed that are applicable to their aircraft operations. Checks of aircraft equipment should be completed in accordance with any criteria or limitation expressed in the AFM or, where the AFM has no instruction for other equipment, the manufacturer's requirements or guidance for that equipment.

Although not mandatory under CASR Part 91, CASA recommends operators develop checklists for the following flight phases, as a minimum:

› before take-off
› approach
› landing.

Refer to **AC 91-22 Aircraft checklist systems** for further information.

Fuel system inspection

The operator and pilot must ensure that they do not have contaminated, degraded or inappropriate fuel on board before flight (CASR 91.465).

The following inspections and tests for the presence of water in the fuel system of the aircraft should be made as part of your flight preparation:

› you should complete an inspection and test in accordance with the approved data, either:

» the aircraft manufacturer's data that specifies the way inspections and tests for the presence of water in the aircraft's fuel system are to be made, or

» the data that has been approved under CAR 42M as part of the aircraft's system of maintenance, or

- in any other case, before the start of each day's flying, and after each fuelling, with the aircraft standing on a reasonably level surface, drain a small quantity of fuel from each fuel tank into a clear transparent container and check by an approved method for the presence of water, and
- on aircraft types, that have fuel system filters and collector boxes it is recommended that all aircraft fuel system filters and collector boxes be checked for water contamination at frequent intervals.

It is important that checks for water contamination of fuel drainage samples be positive in nature and do not rely solely on sensory perceptions of colour and smell, both of which can be highly deceptive. The following methods are recommended:

- Place a small quantity of fuel into the container before taking samples from the tank or filter drain points. The presence of water will then be revealed by a visible surface of demarcation between the two fluids in the container.
- Check the drainage samples by chemical means such as water detecting paper or paste, where a change in colour of the detecting medium will give clear indication of the presence of water.
- In the case of turbine fuel samples, tests should also include inspection for persistent cloudiness or other evidence of the presence of suspended water droplets, which will not necessarily be detected by the methods mentioned above. Should any doubt exist about the suitability of the fuel, the checks specified in the aircraft operator's maintenance manual should be followed. It is advisable to allow turbine fuel a reasonable period of stagnation before drawing test samples from fuel drain points. This allows settling of suspended water which is a slower process in turbine fuel than in aviation gasoline.

If, at any time, a significant quantity of water is found to be present in an aircraft fuel system, the operator and pilot should ensure that all traces of it are removed from the fuel system, including the fuel filters, before further flight.

In eliminating water from an aircraft fuel system, it is important that consideration be given to the possibility of water lying in portions of the tanks or fuel lines where, because of the design of the system or the existing attitude of the aircraft, it is not immediately accessible at a drain point.

It is good practice to ensure that, before each day's flying, you inspect all external fuel tank vents to check that they are free from obstruction.

Passengers – safety briefings and instructions

(CASR 91.565) (MOS 20.06)

Before take-off, your passengers must be given a safety briefing that includes the following:

- a passenger in a control seat not to manipulate or interfere with the controls
- rules about smoking (no smoking during take-off and landing or at any other time you so direct)
- when seat belts must be worn and how to use them (you must direct your passengers before you, taxi and take-off and land, or at any other time you consider it necessary for the safety of your passengers)
- how and when to adopt the brace position
- emergency exits and how to evacuate
- if the aircraft carries oxygen, how and when it is used
- the stowage of baggage or any personal effects
- if life jackets are carried, not to inflate them while in the aircraft and where they are carried and how to use them.

Exception: *The safety briefing and instructions may be omitted for a passenger who has been carried and briefed previously if it can be reasoned that the same safety briefing is not necessary in the circumstances.*

This is a precis of the briefing as described in the rule that would be applicable to most small light aircraft. For the complete rule see (CASR 91 MOS 20.06).

Example

A typical passenger briefing on a private flight could go something like this:

'You must refrain from smoking on the tarmac and in the terminal as well as during take-off, landing and fuelling.'

'Your seatbelts are similar to your car's and I would ask you to keep them fastened comfortably during take-off, landing and any other time I feel it is necessary for your safety.'

'The exits operate like this … and will only be opened on the ground. Please stow your hand luggage under the seat, or I can secure it in the baggage compartment.'

'Please don't touch any of the flight controls.'

'If you feel uncomfortable in any way, please let me know and I'll do everything I can to improve the situation.'

Passenger briefings such as this can instil confidence in your passengers and start the flight off well.

Passengers – safety directions by pilot in command (CASR 91.570)

Before taxiing, taking off or landing you must direct passengers to:

- fasten their seatbelt or shoulder harness
- ensure that their seat back (or berth), if adjustable, is in an upright position or other position permitted by the AFM
- stow any attachments to or for the seat (including a tray table or footrest) or position them as permitted by the AFM.

During the flight, if you believe it is necessary for the safety of the passengers, you must direct them to fasten their seatbelt or shoulder harness. Switching on an illuminated 'fasten seat belt' sign is a direction.

Exception:

- *A direction need not be given to a person whose health may suffer by being restrained by a seatbelt if you agree the person is otherwise safely restrained.*
- *A direction need not be given to a person who is ill or incapacitated if you agree to the passenger not adjusting their seat (or berth) and the person is otherwise safely restrained and will not affect the safety of other passengers.*

Passengers – compliance with safety directions (CASR 91.575)

A passenger must comply with safety directions given by the pilot.

Passengers with special needs

The operator of an aircraft shall ensure that a person with a disability, and the person assisting that person, if any, is given an individual briefing appropriate to that person's needs in the procedures to be followed in the event of emergency evacuation of the aircraft. The briefing should include which emergency exit to use and when to move to the exit. The person giving the briefing should also enquire as to the most appropriate manner of assisting the person with a disability to prevent pain or injury.

For additional information see Multi-Part AC 91-19,121-04,133-10,135-12 and 138-10 – **https://www.casa.gov.au/sites/default/files/2021-08/multi-part-advisory-circular-91-19-ac-121-04-ac-133-10-ac-135-12-ac-138-10-passenger-safety-information.pdf**

Altimetry

QNH is an atmospheric pressure adjusted to sea level and measured in hPa or millibars so that when QNH is set the altimeter will read elevation above mean sea level (AMSL).

area QNH means an altimeter setting forecast by the BoM and is, within ±5 hPa, of any actual QNH of any location within a QNH geographical area published in the Aeronautical Information Publication (AIP).

local QNH means a QNH in an aerodrome terminal area forecast (TAF), forecast by the Bureau of Meteorology (BoM) or the actual QNH reported by the automatic terminal information service (ATIS), aerodrome weather information service (AWIS), certified air/ground radio service (CA/GRS), weather and terminal information reciter (WATIR), automatic aerodrome information service (AAIS) or air traffic control (ATC).

Checking systems for measuring and displaying pressure altitude – general (CASR 91 MOS 10.03)

If the site elevation is known and an accurate QNH is available then before take-off, you must check the accuracy of each altimeter.

At aerodromes that have instrument approaches elevations are depicted at both the aerodrome reference point (ARP) and threshold of each runway. Aerodromes depicted in En Route Supplement Australia (ERSA) only provide the aerodrome reference point elevation. You should be aware that there can be a difference between the aerodrome reference point and the runway threshold elevation. For example, Bathurst NSW, ARP aerodrome elevation is 2,435 ft. The threshold of Runway 17 elevation is 2,391 ft. The threshold runway 35 has an elevation of 2,434 ft.

Checking pressure altitude systems – visual flight rules (VFR) flight (CASR 91 MOS 10.05)

An altimeter used for a VFR flight with an accurate QNH, is only operative if it reads site elevation to within:

› 100 ft, or

› 110 ft at test sites above 3,300 ft.

If an aircraft fitted with 2 altimeters continues to fly VFR with 1 altimeter reading erroneously by more than 100 ft (or 110 ft as the case may be), then you must consider the erroneous altimeter as inoperative for further use.

If you plan to fly VFR above FL200, you must check the altimeter accuracy against the IFR accuracy requirements.

Accurate QNH and site elevation (CASR 91MOS 10.06)

QNH is to be considered accurate only if it is provided by one of the following:

› automatic aerodrome information service (AAIS)

› air traffic control (ATC)

› aerodrome automatic terminal information service (ATIS)

› automatic weather information service (AWIS)

› certified air/ground radio service (CA/GRS)

› weather and terminal information reciter (WATIR).

QNH from an authorised weather forecast must not be used for checking the accuracy of a pressure altimeter.

Site elevation must be derived from aerodrome survey data that is authorised in writing by the Civil Aviation Safety Authority (CASA) or a national aviation authority (NAA) or supplied in writing by the relevant aerodrome operator.

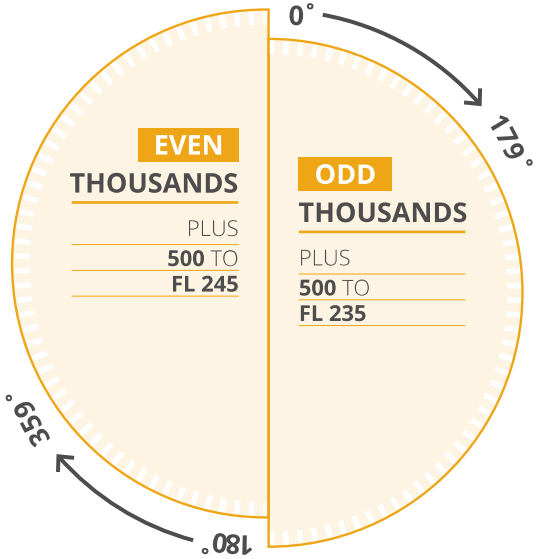
Specified VFR cruising levels (CASR 91.275)

When flying under the VFR you must fly at a specified VFR cruising level for the aircraft track (see Figure below).

Exception: *You may fly at a non-specified VFR cruising level:*

- *when in uncontrolled airspace, and*
- *the aircraft is below 3,000 ft AMSL, or*
- *the aircraft is at, or above, 3,000 ft AMSL, but below 1,500 ft above ground level (AGL) or*
- *it is not practicable to do so, or*
- *if the aircraft is a glider in soaring flight*
- *when in controlled airspace, and ATC has given you a clearance or instruction.*

Figure: Specified VFR cruising levels – at or north of 80 degrees south



VFR flights in Class A airspace must be approved (see CASR 91.285).

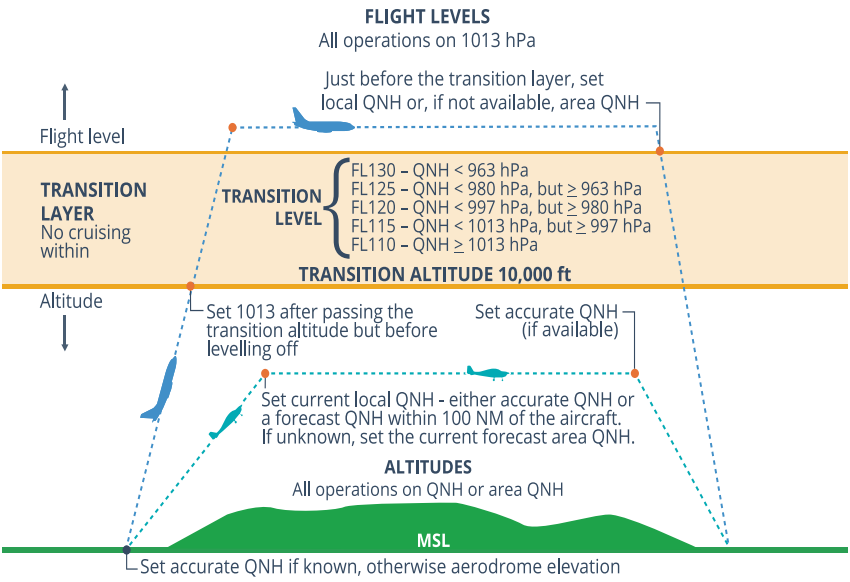
The specified VFR cruising level for the aircraft track for VFR flights is shown above. A cruising level flown north of latitude 60 degrees south must be selected with reference to the aircraft's magnetic track, and south of latitude 60 degrees south, the aircraft grid track.

The specified cruising level for VFR aircraft in weather conditions of visual meteorological conditions (VMC) will only provide you with 500 ft separation between your VFR aircraft and an instrument flight rules (IFR) aircraft that maybe crossing your track in your proximity. It is important to fly and maintain at the correct specified VFR cruising levels. Pilots should be aware that VFR aircraft outside controlled airspace may be operating at random levels below 3,000 ft AMSL.

Transition altitude, transition layer and transition level (CASR Part91 MOS 11.02)

When you are flying within the Australian flight information region (FIR), the transition altitude is 10,000 ft. The transition level is FL110 when the area QNH is 1,013.2 hPa or higher; however, it will vary when an area QNH is below 1,013.2 hPa (see Figure below).

Figure: Positions to change between QNH and 1,013.2 hPa



Note: The intention is to retain a minimum buffer of 1,000 ft between the lowest available flight level (FL) and the transition altitude and therefore cruising within the transition layer is not permitted.

You must not cruise within the transition layer.

If you are flying below the transition altitude, you must use the following altimeter setting:

› the current local QNH (either an accurate QNH from a CA/GRS, ATIS, AAIS, ATC tower, AWIS or WATIR), or a forecast QNH of a station along the route within 100 NM of the aircraft, or

› if the current local QNH is not known, the current area forecast QNH.

If you are flying at, or above, the transition altitude, you must use an altimeter setting of 1,013.2 hPa.

On climb, you must change between QNH and 1,013.2 hPa after passing 10,000 ft and before levelling off. On descent, you must change between 1,013.2 hPa and the QNH before entering the transition layer.

Reminder: VFR Flight in Class A airspace must be approved (CASR 91.285).

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Airspace classification

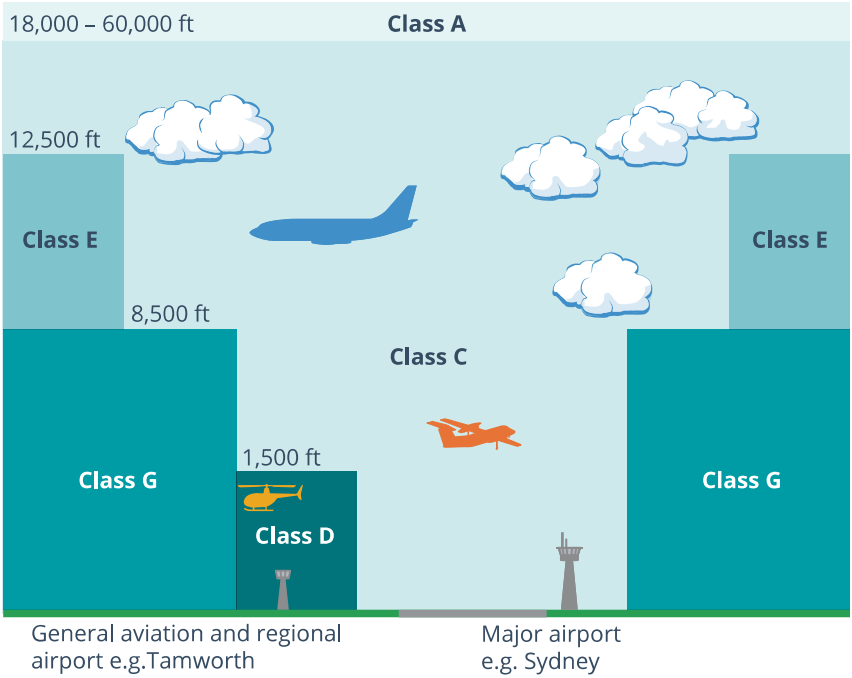
Airspace can be broadly classified as:

› non-controlled airspace – Class G/E*

› controlled airspace – Classes A C D E.*

*For a flight in Class E airspace, a VFR aircraft does not require an air traffic control clearance provided they have two way communications; however, for an IFR aircraft they must obtain a clearance.

Figure: Classes of airspace



The classes of airspace in Australia's FIRs are generally aligned with those specified by the International Civil Aviation Organization (ICAO) Annex 11.

The following table describes the airspace classification (class) used in Australia including ATC services and separation, speed limitation, communications, and ATC clearance requirements.

Class	Type of flight	Separation provided	Service provided	Speed limitation	Radio communication requirements	Subject to ATC clearance
A	IFR	All aircraft	ATC service	Not applicable	Continuous two-way	Yes
	VFR not permitted unless approved (CASR 91.285)					
C	IFR	IFR from IFR, IFR from VFR, IFR from Special VFR	ATC service	250 kt below 10,000 ft AMSL, except where specified in ERSA, departure and approach procedures (DAP) or varied by ATC (see Note 2)	Continuous two-way	Yes
	VFR	VFR from IFR	ATC service for separation from IFR VFR/VFR traffic INFO (and traffic avoidance advice on request)	250 kt indicated air speed (IAS) below 10,000 ft AMSL	Continuous two-way	Yes
	Special VFR	Special VFR from special VFR, when visibility (VIS) does not meet VMC	ATC service		Continuous two-way	Yes

Class	Type of flight	Separation provided	Service provided	Speed limitation	Radio communication requirements	Subject to ATC clearance
D	IFR	IFR from IFR IFR from special VFR	ATC service, traffic information about VFR flights	200 kt IAS at or below 2,500 ft above aerodrome level (AAL) within 4 NM of the primary Class D aerodrome (see Note 3) 250 kt IAS in the remaining Class D airspace	Continuous two-way	Yes
	VFR	Nil	ATC service, traffic INFO on all other flights		Continuous two-way	Yes
	Special VFR	Special VFR from special VFR when visibility is less than VMC	ATC service		Continuous two-way	Yes
E	IFR	IFR from IFR	ATC service and traffic INFO on VFR flights as far as is practicable	250 kt IAS below 10,000 ft AMSL	Continuous two-way	Yes
	VFR	Nil	Flight information service (FIS)	250 kt IAS below 10,000 ft AMSL	Continuous two-way	No
			Surveillance information service (SIS) – flight following on request (O/R) (ATC workload permitting)			

Class	Type of flight	Separation provided	Service provided	Speed limitation	Radio communication requirements	Subject to ATC clearance
G On & North of 65 degrees South	IFR	Nil	FIS	250 kt IAS below 10,000 ft AMSL	Continuous two-way	No
	VFR	Nil	FIS SIS – flight following O/R (ATC workload permitting)	250 kt IAS below 10,000 ft AMSL	VHF radio required for operations above 5,000 ft AMSL and at aerodromes where carriage and use of radio is required	No
				250 kt IAS below 10,000 ft AMSL	VHF radio required for operations in reduced VMC	No
G (South of 65 degree south)	IFR	Nil	FIS O/R	250 kt IAS below 10,000 ft AMSL	Continuous two-way	No
	VFR	Nil	FIS O/R	250 kt IAS below 10,000 ft AMSL	Nil	No

Note 1: Pilots must comply with airspace speed limitation unless specifically cancelled by ATC.

Note 2: Speed limitations are not applicable to military aircraft, except as specified in ERSA.

Note 3: If traffic conditions permit, ATC may approve a pilot's request to exceed the 200 kt speed limit to a maximum limit of 250 kt unless the pilot informs ATC a higher minimum speed is required. For flights in A,C,D and E airspace, aircraft must be fitted with a transponder.

Air traffic services provided by airspace and class of operation (AIP ENR 1.4)

Airspace	Class of operation
Class A	Controlled airspace IFR flights only VFR not permitted unless they are approved
Class C	Controlled airspace below Class A excluding airspace designated as Class D, E or G IFR and VFR are permitted and are subject to ATC clearance. Both IFR and VFR are separated
Class D	IFR and VFR flights are permitted, and all flights are subject to ATC clearance. IFR flights are separated from other IFR flights. IFR flights receive a separation service in respect of other VFR flights. A separation service is a controlled condition whereby a separation standard need not be applied between IFR and VFR aircraft.
Class E	IFR and VFR flights are permitted. IFR flights are subject to ATC clearance. IFR flights are separated from other IFR flights. IFR flights receive traffic information on known VFR flights, as far as practicable.
Class G	IFR and VFR flights are permitted and receive flight information service, if requested. Non-controlled airspace

For flight in close proximity to the boundary of controlled airspace, separation is not provided with traffic operating outside controlled airspace.

Prohibited, restricted and danger areas

Airspace reservation (AIP ENR 1.4, ERSA-SUA)

A designated airspace or portion thereof under the control of another authority may be reserved to allow the following:

› flights of special military significance requiring the use of controlled airspace, which would be subject to unacceptable restrictions if normal operations applied, or

› civil flights requiring passage through military airspace when weather conditions or other factors make flight on the normal air route inadvisable, or impossible, and when other routes are unavailable, or the use of such routes would impose severe economic penalties on the operation of the aircraft.

There are two types of airspace reservations:

› fixed defined areas

› 'mobile' (for example aerial fuelling, en route formation flights).

Such reservations are normally only applied during limited periods. A designated airspace or portion thereof under the control of a military ATC authority may also be reserved to confine particular activities.

Airspace in which a potential hazard to aircraft operations may exist, are promulgated as follows:

› **Prohibited area** – Airspace within which the flight of aircraft is prohibited.

› **Restricted area** – Airspace within which the flight of aircraft is restricted in accordance with specified conditions.

› **Danger area** – Airspace within which activities dangerous to the flight of aircraft may exist at specified times.

These areas are promulgated in the AIP designated in the Designated Airspace Handbook (DAH) and on aeronautical charts by boundaries outlined in red and containing the identification of the area as a letter and a number.

The letters allocated are:

P Prohibited area
R Restricted area
D Danger area
M Military operating area

A number identifies the area.

When used internationally, the identification of these areas is preceded by an FIR identifier as follows:

YB Brisbane
YM Melbourne

Details are shown in ERSA or through Notices to Airmen (NOTAMs).

Prohibited, restricted and danger area numbers in the 900 series are allocated for temporary special use airspace such as military exercises, air shows and special events.

These areas are promulgated by the AIP supplement (SUP), or FIR NOTAM for the Brisbane (YBBB) or Melbourne (YMMM) FIRs as appropriate for the location.

Unless otherwise specified, vertical limits are promulgated as AMSL when at or below the transition altitude, or as a flight level when above the transition altitude. The abbreviation SFC means the surface of the ground or water. 'NOTAM' indicates that the vertical limits or hours of activation will be notified by NOTAM.

The promulgated vertical limits of prohibited, restricted and danger areas include all the buffers necessary for the protection of aircraft operating outside these areas. Therefore, the promulgated levels may be used by aircraft avoiding the areas, except where the vertical limit abuts controlled airspace, in which case a clearance is required.

If you become aware your aircraft is in an active prohibited or restricted area, and you are able to communicate, you must inform ATS, or the controlling authority specified in the AIP and:

› fly out of the area, or
› for balloons and hot air airships (Part 131 aircraft) unable to fly out of the area, land and then inform the controlling authority as soon as practicable.

CASA may declare an area to be a prohibited area for reasons of military necessity.

CASA may declare an area to be a restricted area, if CASA believes it is necessary to restrict flight in accordance with specified conditions for public safety or to protect the environment.

Prohibited and restricted areas declared for 3 months or longer are published in the AIP. For shorter periods they are published by NOTAM (see regulation 7 of the Airspace Regulations 2007).

Flight within prohibited areas

Flight within a prohibited area is not permitted in any circumstances.

Flight within restricted areas

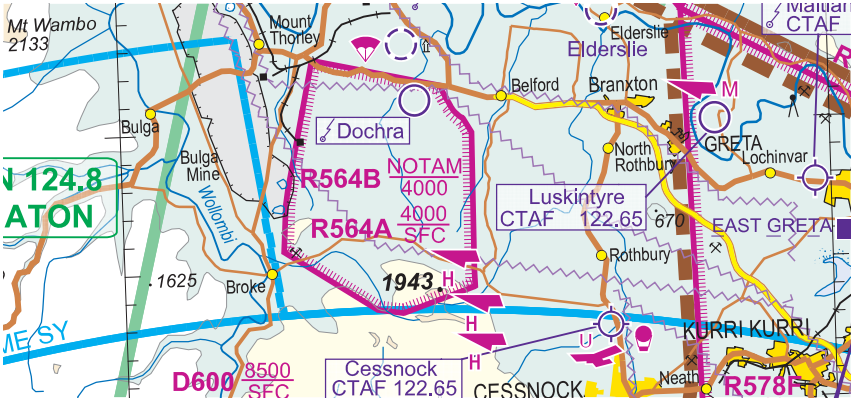
A flight must not enter an active restricted area without authorisation (CASR 91.260).

To obtain access to a restricted area or airspace you must request approval from the controlling authority (see ERSA prohibited, restricted and danger areas (PRD)). When an ATC service is available within that airspace, approval may be requested from ATC directly, in the same manner as a clearance request to enter a control area (CTA).

On 15 June 2023 Australia's Airspace Regulations 2007 were amended so that in international airspace (airspace outside Australian territory) areas designated as restricted were redesignated as danger areas. This included military exercise areas and military training areas.

Note: Clearances may be withheld when activities hazardous to the aircraft are taking place, or when those activities require absolute priority.

Figure: Restricted area example



R564A 4000 SFC

Must NOT operate without permission

R564B NOTAM 4000

May operate ABOVE 4,000 ft without permission provided not activated by NOTAM

Airservices Australia | Newcastle VNC

SFC/4000 shown in the picture means R564A extends from surface level to 4,000 ft. AMSL when active.

NOTAM/4000 shown in the picture means R564B extends from 4000 to an upper level which will be promulgated by NOTAM.

When air traffic service (ATS) is available within an activated restricted area, ATS may approve your flight within or across the area if you request clearance in the same way as for entering controlled airspace.

A clearance may be withheld when hazardous activities are taking place or when those activities require priority.

Provided you receive an ATC clearance, you may fly:

- from controlled airspace into an adjoining activated restricted area, or
- through an activated restricted area into adjoining controlled airspace, or
- through an activated restricted area within controlled airspace.

To assist with shared use of airspace, all restricted areas have been allocated a restricted area (RA) conditional status. This status will give an indication as to the likelihood of obtaining a clearance to fly through restricted airspace. NOTAMs may be issued to indicate changes to the RA conditional status and should be checked prior to flight planning.

RA conditional status legend

RA1 – Pilots may flight plan through the restricted area and under normal circumstances expect a clearance from ATC.

RA2 – Pilots must not flight plan through the restricted area unless on a route specified in ERSA General (GEN) Flight plan route (FPR) or under agreement with the Department of Defence. However, a clearance from ATC is not assured. Other tracking may be offered through the restricted area on a tactical basis.

RA3 – Pilots must not flight plan through the restricted area and clearance will not be available.

Note: In a declared emergency, every effort will be made to obtain approval to transit a restricted area, irrespective of its conditional status.

Civil aircraft operating in military restricted areas or airspace in which an ATC service is provided will receive a service equivalent to that of Class C airspace, unless specified otherwise by ERSA Facility (FAC).

You may assume that ATC has obtained approval, when complying with an air traffic clearance for flight:

- from controlled airspace into an adjoining active restricted area or airspace
- through an active restricted area or airspace into adjoining controlled airspace, or
- through an active restricted area or airspace within controlled airspace.

Flight within danger areas

You may fly in a danger area.

You should be aware of the specific activity which causes an area to be designated as a danger area (see Figure below).

The operator and the pilot must take such precautions and make such contacts as a reasonable pilot in the same circumstances would take and make, when flying within or over an area in which an activity exists that is a potential danger to aircraft.

A danger area may be classified as a military operating area (MOA) and will be distinguished by the use of the prefix M.

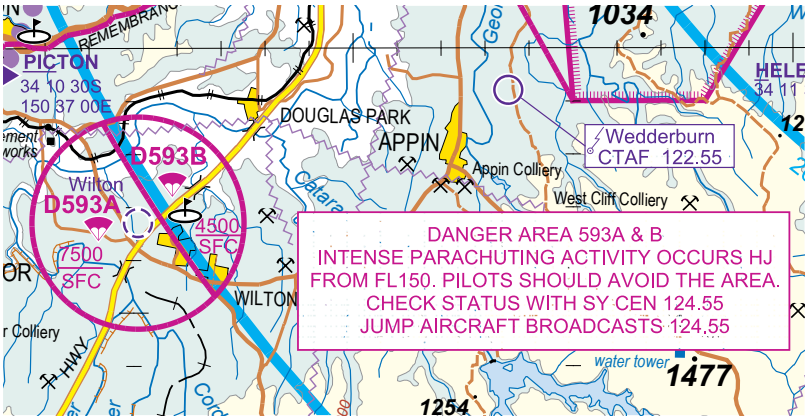
MOAs have been established at Cerberus (Vic), Edinburgh (SA), East Sale (Vic), Nowra (NSW) and Williamtown (NSW). See current aeronautical information circulars (AIC).

The following conditions will apply when seeking access to MOAs:

- Australian-registered aircraft must request a clearance to transit a MOA and conditions of entry may be imposed.
- foreign-registered aircraft can transit a MOA outside Australian territory without a clearance. Within Australian territory however, a clearance must be requested and conditions of entry may be imposed.

Danger areas in international airspace may lie in controlled airspace.

Figure: Danger area example



Airservices Australia | Sydney VTC

Details on prohibited, restricted and danger areas can be found in the relevant aeronautical charts, NOTAMS, the En Route Supplement Australia – prohibited, restricted and danger areas (ERSA-PRD) and the DAH.

Lanes of entry

Lanes of entry are established to permit passage to and from specified Class D control zones (CTRs) without entering an adjacent Class C or military control zone. The vertical limits provide separation from overlying control or restricted areas (AIP ENR 1.4).

Broadcast areas

The following broadcast areas (BAs) including associated mandatory broadcast procedures relating to BAs are detailed in Chapter 5: Radio communication procedures.

› Ayers Rock BA
› Ballina/Byron Gateway BA
› Port Hedland BA

Common traffic advisory frequency (CTAF)

At non-controlled aerodromes published on aeronautical charts, when you are operating in the vicinity of these aerodromes, you are to use 126.7 MHz or the discrete CTAF frequency as published on the chart.

When you are in the vicinity of an uncharted aerodrome, you have discretion to use the most appropriate frequency that ensures safe operation. This may be 126.7 MHz. However, because pilots may not know such uncharted aerodromes exist, you should be aware that transiting aircraft may be monitoring Area VHF. To ensure mutual traffic awareness, it is recommended that when you are using an alternative frequency you also monitor Area VHF.

Air defence identification zone

From time to time it may be necessary for an air defence identification zone (ADIZ) to be established. Such zones will be promulgated by NOTAM and/or Aeronautical Information Circular (AIC). Procedures relating to ADIZ can be found later on in this Chapter.

Air traffic services (ATS) surveillance services

Carriage of transponder equipment (CASR 91 MOS 26.68)

Transponder surveillance equipment required to be fitted to an aircraft must meet the relevant operational and airspace requirements.

An aircraft operating at Brisbane, Sydney, Melbourne or Perth aerodrome must be fitted with, or carry, at least one approved Mode S transponder with automatic dependent surveillance-broadcast (ADS-B) capability.

Note: An approved Mode S transponder with ADS-B capability is not required to transmit ADS-B OUT for a VFR flight.

See **Part 91 PEG** for a comprehensive description of transponder requirements in in all classes of airspace.

Operation of transponder equipment – general requirements (CASR 91 MOS 26.69)

Except for any requirements governing inoperative transponders and unless ATC has issued an instruction otherwise:

› Transponders required to be fitted or carried on an aircraft must be continuously operated.

Note: Continuous operation for a transponder implies that the equipment must be operated in a mode that enables a secondary surveillance radar (SSR) response to be transmitted and, where an altitude reporting capability is available, that this capability is also activated.

› Unless otherwise required by ATC, an aircraft that is flying in formation with, or is in-company with, other aircraft, is not required to operate a transponder if a transponder is always operated by another aircraft while the aircraft are flying in formation or are in-company.

› If an aircraft is fitted with more than one transponder, only one transponder is to be operated at any time.

› Where a transponder is fitted, the Mode A code must be set:
  » to the transponder code assigned by ATC for the flight, or
  » if no transponder code is so assigned – to the relevant standard code in the Table below.

› The emergency codes 7500, 7600 and 7700 do not need to be set if it would be safer to retain an existing code.

Table: Transponders – Mode A standard codes

Situation	Mode A Code
Flights in class A, C or D airspace, and IFR flights in class E airspace	3000
IFR flights in class G airspace	2000
VFR flights in class E or class G airspace	1200
Flights in class G over water at a distance greater than 15 NM from shore	4000
Flights engaged in coastal surveillance	7615
Ground testing by aircraft maintenance staff	2100
Unlawful interference	7500
Loss of radio communication	7600
In-flight emergency (unless ATC instructs otherwise)	7700

VFR flights in Class E or G airspace squawk 1200 Mode C (ALT)

ATS will assign a discrete code for each flight for aircraft operating in controlled airspace, and for aircraft participating in SIS.

Unless otherwise advised by ATC, if your aircraft is equipped with a Mode 3A or Mode S transponder you must activate the transponder, and where a Mode C capability is also available it must be activated simultaneously with Mode 3A.

You must ensure that transponders and ADS-B transmitters are activated, and that altitude function is selected so that:

› primary radar coverage only exists within 50 NM of major airports and the remainder of the ATS surveillance system relies on SSR transponder and ADS-B transmitter information

› the traffic alert and collision avoidance system (TCAS) relies on transponder information for its pilot alerting and collision avoidance functions.

When you require a SIS and/or a clearance into controlled airspace, and for which a discrete code has already been coordinated, you must select that code immediately prior to making the SIS/clearance request.

You must not operate the identification (IDENT) pushbutton (shown in the picture below) unless requested to do so by ATC.

The IDENT pushbutton activates the special position indicator (SPI) function of the transponder.

When departing from a radar-controlled aerodrome you must leave the transponder selected to **Standby** until entering the departure runway, and on arrival select **Standby** or **Off** as soon as practicable after landing.

You must select the transponder to Standby before effecting any SSR code change and then return the transponder to ON/ALT.

Note: This action is required to prevent loss of possible display of aircraft position/label information and possible misidentification of aircraft in automated Australian ATC systems due to temporary selection (while effecting the change) of a code already in use.

Transponder emergency codes (AIP ENR 1.6)

Pilots of aircraft encountering an emergency in flight, other than loss of two-way communications, should select code 7700 unless they have a specific reason to believe that maintaining the assigned code would be the better course of action.

Transponder emergency codes

Transponder emergency codes

The pilot of an aircraft losing two-way communications must set the transponder to code 7600.

A radar controller observing a 7600 code shall request the pilot to 'squawk IDENT' (which means to activate the SPI function). If the identification signal is received, further control of the aircraft will be continued using the identification transmission to acknowledge receipt of instructions issued.

If the identification is not received, the aircraft must continue with the transponder on code 7600 and follow radio failure procedures set out in Chapter 7 – Dealing with emergency situations.

Radio communications procedures (AIP ENR 1.6)

Pilots requesting ATS surveillance services should address their request to the ATS unit with which they are communicating.

Where an area approach control centre (AACC) is not established, the pilot will be advised the time or place to transfer to a control frequency.

Where an AACC is established, procedural and ATS surveillance services may be provided on a common frequency. The callsign identifies the service being provided, for example:'... centre', '... approach', '...departures'.

Identification procedures (AIP ENR 1.6)

Before providing an ATS surveillance service there will be positive identification of the aircraft concerned. However, control services will not be provided until the aircraft is within controlled airspace.

Vectoring procedures (AIP ENR 1.6)

On receipt of heading instructions, you must, unless otherwise instructed, immediately commence a rate 1 turn, or the standard rate of turn for the aircraft type, and then maintain the heading given.

Aircraft will normally be vectored on routes along which you can monitor your navigation.

ATC are not permitted to vector special VFR flights, unless warranted by an emergency.

When an aircraft is given a vector, which will take it off an established route, you will be advised of the reason for the vector, unless it is self-evident.

Where you have reported your aircraft has unreliable directional instruments, you will be asked, before being issued with manoeuvring instructions, to make all turns at an agreed rate and to carry out the instructions immediately on receipt.

When aircraft are being vectored, the controller will assign altitudes which allow for terrain clearance. However, in VMC by day, an aircraft may be permitted to arrange its own terrain clearance. In such instances the aircraft will be instructed to:

> **[Turn left (or right) heading (heading)] [climb (or descend) to (level) visual.]**

When being vectored you will be routinely advised of your position to enable you to navigate in the event of radio or ATS surveillance system failure.

The interval between ATC transmissions will be kept short to enable you to quickly recognise a communication failure. When aircraft are on headings that could infringe terrain clearance or separation standards, the intervals between transmissions will not exceed 30 seconds.

Before take-off, ATC may assign you a heading to assume after take-off, followed by frequency change instructions if appropriate.

Arriving aircraft may be vectored to:

› establish for a radar or pilot-interpreted approach
› a position from which a visual approach can be made
› avoid areas of hazardous weather or severe turbulence
› expedite traffic flow or conform to noise abatement requirements.

Search and rescue – SARWATCH and SARTIME

SARWATCH refers to search and rescue watch and SARTIME to the time that search action is required.

Cancellation of SARWATCH (AIP ENR 1.1)

Pilots wishing to cancel SARWATCH may do so by reporting to ATS. When cancelling SARWATCH, pilots must include:

› the aircraft radio callsign
› place of arrival, or point from which SARWATCH services are no longer required
› the words 'Cancel SARWATCH'
› when communicating with a unit other than that nominated, the name of the ATS unit to which the report should be relayed.

SARWATCH may be cancelled in combination with a pilot report of changing to a common traffic advisory frequency (CTAF), in the circuit area, or after landing.

ATS will acknowledge **'Cancel SARWATCH'** reports with a read-back of the place of arrival, if appropriate, and the words **'SARWATCH terminated'**.

The preferred method to cancel SARTIME is via telephone to the automated centralised SARTIME database (CENSAR) on 1800 814 931. When telephone facilities are not available you may use ATS frequencies.

For SARTIME flights, pilots of single VHF radio-equipped aircraft must cancel SARTIME before changing to CTAF, or after landing.

SARTIME for departure

When submitting flight notification, you may nominate a SARTIME for departure for the initial departure aerodrome through the National Aeronautical Information Processing System (NAIPS). Intermediate departure times can be nominated by telephone after landing, or as part of the arrival report associated with that aerodrome. Only one SARTIME can be current at any time.

You can also submit the flight notification that includes a SARTIME by fax or via telephone, using the Australian domestic flight notification form (AIP ENR 1.10).

The nomination of a SARTIME for departure does not absolve the pilot from complying with the requirements for the carriage of serviceable radio equipment, or from making the prescribed reports.

Pilots of a VFR flight wishing to extend the SARWATCH for the period of landing and subsequent take-off, can nominate a SARTIME for departure when arriving at an aerodrome where radio or ground communication cannot reasonably be assured. SAR alerting action will be initiated if a taxiing or departure report is not received by the nominated SARTIME.

Operational information

Information about the operational aspects of the following subjects is normally available from ATS:

- meteorological conditions and hazard alerts
- air routes and aerodromes, other than aircraft landing areas (ALAs)
- navigational aids and communication facilities
- ATS procedures, airspace status and search and rescue services
- maps and charts, and
- regulations concerning entry, transit and departure for international flights.

You are responsible for requesting information necessary to make operational decisions. (AIP GEN 3.3). See Chapter 5 under Flight information service for more information.

Non-controlled aerodromes

At non-controlled aerodromes there is often a variety of aircraft operations. These could include larger passenger-carrying turboprop aircraft and jets, as well as agricultural, training and various sport and recreational aircraft, and on occasions even military aircraft. For all pilots this requires vigilance. When undertaking flights to a certified aerodrome it requires that you must be equipped with a VHF radio.

A non-controlled aerodrome is one where air traffic control is not operating. This can be either an aerodrome that is always in Class G airspace, an aerodrome with a control tower where no air traffic control service is currently operating, or an aerodrome that would normally have an ATC service, but the service is temporarily unavailable.

Non-controlled aerodromes where the carriage of radios is required include all certified and military aerodromes as published in ERSA. CASA may designate other aerodromes on a case-by-case basis, as published in ERSA or by NOTAM. Pilots of aircraft fitted with a radio must maintain a continuous listening watch (CASR 91.640).

Note: Pilots are reminded that non-controlled aerodromes include those aerodromes with Class C or D ATC services during the times when such services are unavailable. Pilots should always consult ERSA and the latest NOTAMs for operating times of ATC services at those aerodromes.

Operations at non-controlled aerodromes can present many challenges to pilots who operate into, out of, or in the vicinity, of these aerodromes. These challenges can include:

› complying with standard operating procedures
› fitting into the circuit traffic
› dealing with threats and hazards that may be encountered.

At aerodromes where the carriage of radio is not mandatory, good flying dictates that pilots of radio-equipped aircraft monitor their radios and broadcast their intentions in accordance with the minimum required calls. Pilots should also observe local and published noise abatement procedures, circuit direction and curfews.

When you are flying at, to, from or over a non-controlled aerodrome there will be times when you will be flying 'in the vicinity' at that aerodrome. The term 'in the vicinity' has been defined in the regulations for you to determine what is required by you when flying at non controlled aerodromes. You need to understand the meaning of 'in the vicinity' to safely fly and comply with the regulations at those aerodromes.

Meaning of 'in the vicinity' of a non-controlled aerodrome (CASR 91.360)

An aircraft is in the vicinity of a non-controlled aerodrome if it is:

› in uncontrolled airspace, and
› within 10 NM of the aerodrome, and
› at a height above the aerodrome that could result in conflict with operations at the aerodrome.

For an aerodrome that has a reference point published in the AIP, the distance must be measured from that point. The definition of 'in the vicinity' of a non-controlled aerodrome applies in CASR 91.375, 91.380, 91.385 and 91.390.

Operating on manoeuvring area, or in the vicinity, of a non-controlled aerodrome – general requirements (CASR 91.375)

When operating on the manoeuvring area, or in the vicinity of a non-controlled aerodrome you must:

› keep a lookout for other aircraft to avoid a collision
› ensure that your aircraft does not endanger other aircraft
› either join or avoid the circuit pattern of the aerodrome
› for an aeroplane only, take off or land within the aerodrome landing area.

Civil Aviation Safety Authority

Managing traffic at non-controlled aerodromes

(AC 91-10)

Pilots of radio-equipped aircraft are strongly recommended to use standard aerodrome traffic circuit procedures and radio broadcasts at all non-controlled aerodromes. See Chapter 5 – radio communication procedures for more detail.

Pilots are encouraged to turn on external lights, where fitted, when in the vicinity of a non-controlled aerodrome, and until the aircraft has landed and is clear of all runways.

Transponders can be detected by aircraft equipped with airborne collision avoidance system (ACAS) or traffic collision avoidance systems (TCAS), allowing them to 'see' other aircraft and take evasive action. Pilots of transponder-equipped aircraft should, at all times, ensure their transponder is switched to ON/ALT (Mode C), especially when operating in the vicinity of a non-controlled aerodrome. In the event of a radio failure, it is important for pilots to select and squawk (transmit) code 7600 in Mode C on their transponders.

So as not to impede commercial aviation, pilots flying recreational, sport or general aviation (GA) aircraft for their own leisure, should consider giving way to aircraft being used for commerce provided that the inconvenience to their own operation is not great and it can be done safely. Operators of commercial aircraft should never expect a give-way offer to be made. Any offer to give way must be explicit and its acceptance acknowledged.

Pilots are reminded of their responsibility (CASR 91.325) to maintain vigilance so far as weather conditions permit to see and avoid other traffic. Pilots should not assume that no local air traffic exists if they do not receive any radio transmissions relating to the presence of other aircraft.

The following is a non-exhaustive list of examples where not receiving a radio transmission fails to prove that the airspace is clear of traffic.

You and/or the other pilot:

- may not have radio communication available, or VHF coverage is limited (for example, due to lack of ground-based VHF equipment) and only pilots in the immediate vicinity of other aircraft with VHF radios can communicate (see investigation number AO-2013-105 at **www.atsb.gov.au**)
- may not have set up the aircraft's radio equipment properly (for example, volume) (see investigation number 200605091 at **www.atsb.gov.au**)
- transmit on the CTAF simultaneously, in which case neither you nor the other pilot would receive any audible transmissions (see investigation numbers AO-2013-205 and AO-2013-148 at **www.atsb.gov.au**).

Circuit procedures at non-controlled aerodromes

Separation minima for take-off and landing (CASR 91.370)

Rules for take-off

Note this requirement only applies at a non-controlled aerodrome. ATC may vary these minima at a controlled aerodrome.

You must not commence a take-off until a preceding departing aircraft using the same runway:

- has crossed the upwind end of the runway, or
- has commenced a turn, or
- the runway is longer than 1,800 m and the other aircraft must have become airborne and be at least 1,800 m beyond your proposed lift off point, or
- the other aircraft and your aircraft must each have a maximum take-off weight (MTOW) below 2,000 kg and the other aircraft must be airborne at least 600 m beyond your proposed lift off point.

You must not commence a take-off until a landing aircraft that is using the same runway has vacated the runway or if using a crossing runway, has crossed or stopped short of the runway intersection.

Rules for landing

You must not continue an approach to land beyond the threshold of the runway until:

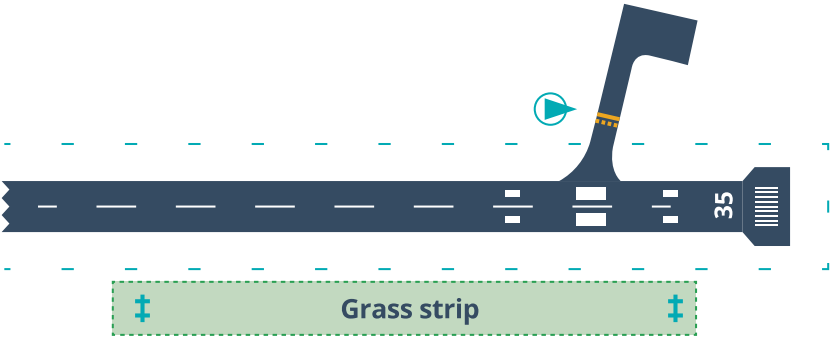
- an aircraft that is taking off from the same runway has become airborne and commenced a turn, or
- an aircraft that is taking off from the same runway is beyond the point of the runway at which your aircraft could be expected to complete its landing roll, and there is enough distance to manoeuvre in the event of a missed approach, or
- an aircraft landing on the same runway has vacated the runway, or is taxiing away from the runway, or
- if a landing aircraft ahead is using a crossing runway, the aircraft ahead has crossed or stopped short of the runway intersection.

Application of rules where gliders or glider tugs operate

At an aerodrome where gliders or glider tugs are operating to a common circuit pattern from either a runway or parallel strip, you cannot take off or land when another aircraft on the parallel strip or runway is taking off or landing. However, you may take-off or land if there is another aircraft taxiing or stationary, on either the runway or parallel strip, provided it does not affect your ability to take off or land safely (see Figure below).

Exception: *The above requirements do not apply where gliders and glider tugs are permitted to operate in contra-rotating circuits on both a runway and a parallel strip outside the runway strip, and simultaneously.*

Figure: Runway with parallel strip



Landing and taking off into the wind (CASR 91.380)

To the extent practicable, you must land and take-off into wind unless:

› the aircraft's flight manual allows you to land or take off downwind or crosswind, and

› you are satisfied that traffic conditions at the aerodrome will allow you to land or take off safely.

It is well documented that taking off and landing into wind is the safest option. However, runway options do not always allow for an into-wind take-off without some crosswind component. Pilots should be familiar with the crosswind limitation in the AFM.

Although the regulation does not preclude a downwind take-off or landing, they should not be attempted in other than very light winds. You should be aware that the take-off and landing distance will increase, and you should apply a considerable safety margin to the normal take-off and landing calculations. You should also consider that the climb and descent angle will be lower/flatter than when operating into wind, and obstacle clearance may become a critical issue after take-off or on your approach to land. You must not exceed any limitation in the AFM.

Standard circuit procedures (CASR 91.385)

The standard aerodrome traffic circuit pattern facilitates an orderly flow of traffic and is normally a circuit pattern made with all turns to the left. When arriving at an aerodrome to land, a pilot will normally join the circuit upwind, crosswind (mid-field), or downwind (before mid-downwind). Landings and take-offs should be made on the active runway or the runway most closely aligned into wind.

If a secondary runway is being used, pilots using this secondary runway should avoid impeding the flow of traffic on the active runway.

Aerodromes that have right-hand circuits are listed in ERSA. Circuit information may also be published or provided by aerodrome operators in other sources of aeronautical information.

Note: At many aerodromes, the circuit direction at night is different to the direction during the day. This is generally because of terrain, obstructions or noise abatement issues.

Exception: *The above circuit pattern requirements do not apply:*

- *to a seaplane or amphibian, where it is necessary:*
  - *to avoid an obstacle, or*
  - *without compromising the aircraft's safety, to avoid undue noise over a populated area, or*
  - *for a single-engine seaplane or amphibian, to enable the aircraft to land on water if its engine fails*
- *to a glider (other than a glider without an engine operating) if the pilot believes it is necessary to land safely.*

Requirements for maintaining the same track after take-off

(CASR 91.390)

For other than a helicopter, you must, after take-off, maintain the take-off track until the aircraft is above 500 ft AGL unless a track change is necessary to avoid terrain.

Exception: *The above circuit pattern requirements do not apply to a seaplane or amphibian, where it is necessary:*

- *to avoid an obstacle, or*
- *without compromising the aircraft's safety, to avoid undue noise over a populated area, or*
- *for a single-engine seaplane or amphibian, to enable the aircraft to land on water if its engine fails.*

Maximum speed

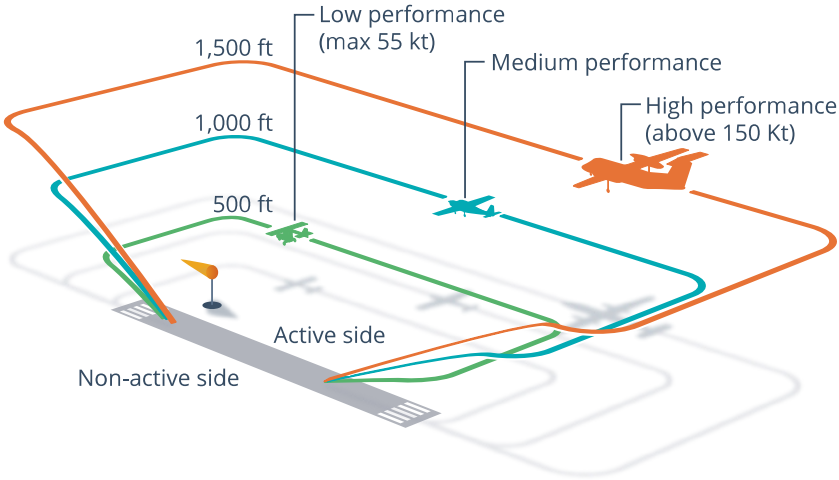
Aircraft should not be flown in the circuit at more than 200 kt.

Civil Aviation Safety Authority

Circuit heights

By convention, aircraft should fly the standard traffic circuit at the heights above aerodrome elevation (as in the table and diagram below).

Type of aircraft	Standard circuit speed	Standard circuit height
High performance (includes jets and many turboprops)	Above approximately 150 kt	1,500 ft above aerodrome elevation
Medium performance (includes most piston engine aircraft and gliders)	Between approximately 55 kt and 150 kt	1,000 ft above aerodrome elevation
Low performance (trikes and ultralight aircraft)	Approximately 55 kt maximum	500 ft above aerodrome elevation



During initial climb-out, the turn onto crosswind should be made at a height appropriate to the performance of the aircraft but, in any case, not less than 500 ft above terrain so as to be at circuit height when turning downwind.

Pilots may vary the size of the circuit depending on:

› the performance of the aircraft
› AFM/pilot operating handbook (POH) requirements
› company standard operating procedures (SOPs) and/or
› other safety reasons.

Final approach

The turn onto final approach should be:

- completed by a distance and height that is common to all operations at the particular aerodrome
- commensurate with the speed flown in the circuit for all aircraft of the same type.

In any case, the turn onto final should be completed by not less than 500 ft above aerodrome elevation. This should allow sufficient time for pilots to ensure the runway is clear for landing. It will also allow for the majority of aircraft to be stabilised for approach and landing.

Departing the circuit area

Aircraft should depart the aerodrome circuit area by extending one of the standard circuit legs or climbing to depart overhead. However, the aircraft should not execute a turn to fly against the circuit direction unless the aircraft is well outside the circuit area and no traffic conflict exists. This will normally be at least 3 NM from the departure end of the runway but may be less for aircraft with high climb performance. In all cases, the distance should be based on the pilot's awareness of traffic and the ability of the aircraft to climb above and clear of the circuit area.

Be aware of traffic joining the circuit by the recommended overfly procedure, especially if climbing to depart overhead of the aerodrome (**AC 91-10**).

Note: Pilots of departing aircraft should be aware of traffic intending to join the circuit by the recommended overfly procedure as they can be 2,000 ft or more above aerodrome elevation.

Arrivals, departures and transits (AC 91-10)

Figure: Arrival procedure

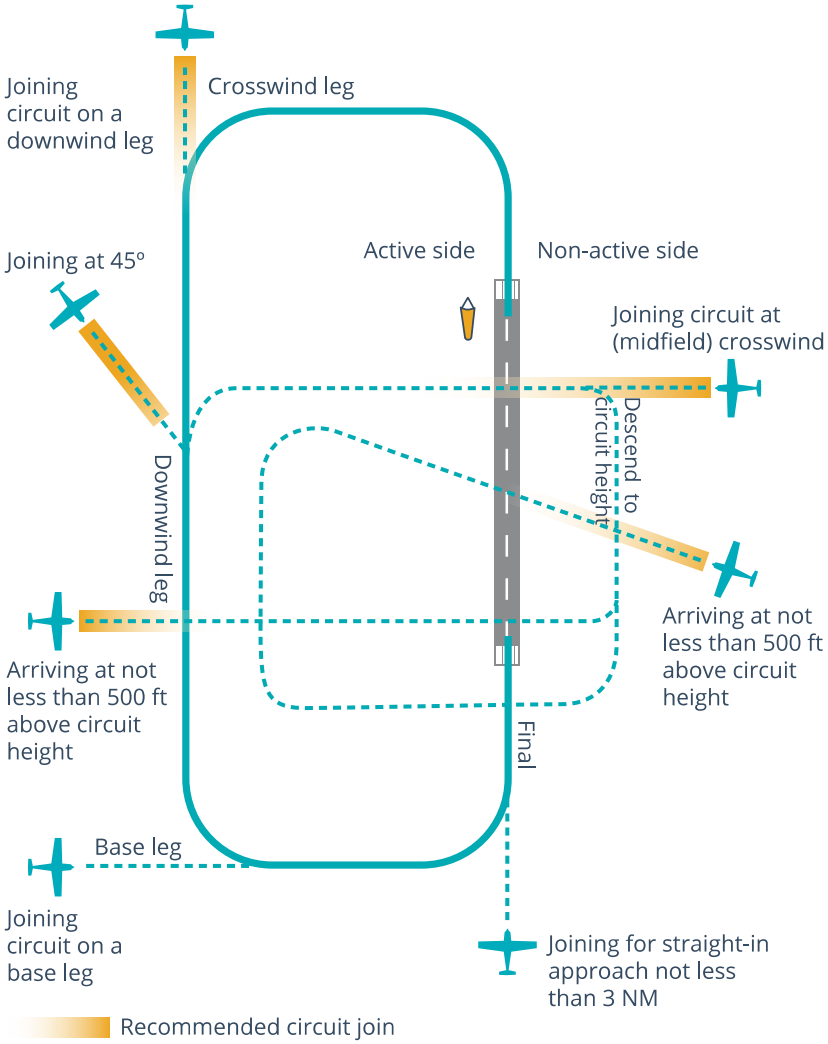
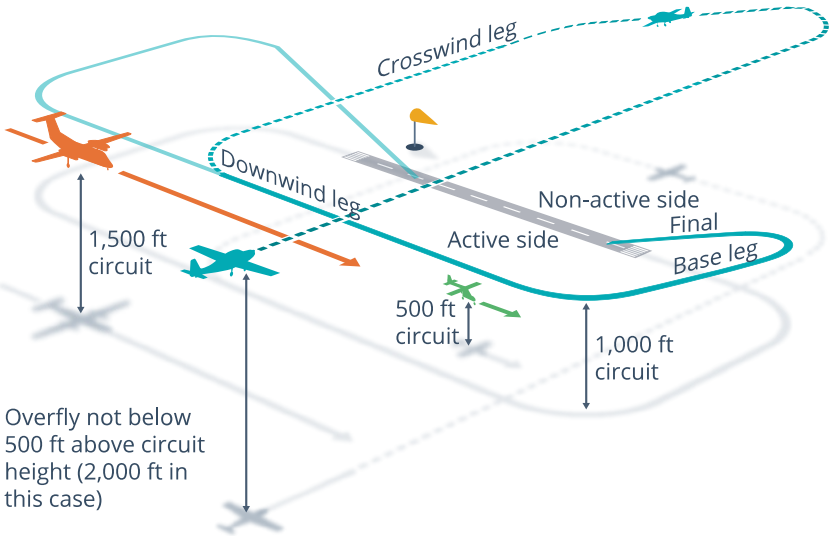


Figure: Recommended circuit join



Pilots departing and arriving at non-controlled aerodromes where the carriage of radio is mandatory are expected to monitor their radios and broadcast their intentions. Pilots should also make additional broadcasts when considered necessary to minimise any risk of collision.

Where a pilot is unfamiliar with the aerodrome layout, or when its serviceability, wind direction, wind speed, or circuit direction cannot be ascertained prior to arrival, use the overfly procedure. Overfly or circle the aerodrome at least 500 ft above the circuit altitude, which may be 2,000 ft or more above the aerodrome elevation (as in the case shown above). When you have determined the circuit direction, position the aircraft to a point well clear (normally the non-active side of the circuit) before descending to a circuit altitude that equates to the aircraft's performance.

Do not descend into the active side of the traffic circuit from above because of the difficulty of seeing – and being seen by – aircraft directly below the aircraft's flight path.

Low performance aircraft – For low-performance ultralight aircraft and rotorcraft with a maximum speed of approximately 55 kt, it is recommended that the aircraft overfly midfield at 500 ft above aerodrome elevation. This will minimise the risk of conflict with higher or faster traffic.

Descent on the non-active side – When arriving and intending to join the circuit from overhead, descend on the non-active side of the circuit so that the aircraft is established at its circuit altitude as it crosses the runway centreline on crosswind, between midfield and the departure end of the runway.

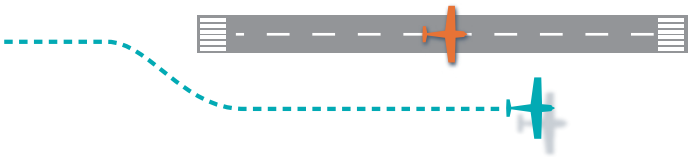
Arrival on the active side – When arriving on the active side, the recommended method is to arrive at the circuit altitude entering midfield at approximately 45° to the downwind leg, while giving way to aircraft already established in the circuit.

The downwind leg – On downwind, maintain the applicable circuit altitude until commencement of the base leg turn. The base leg position is normally when the aircraft is approximately 45° from the reciprocal of the final approach path, measured from the runway threshold. Along the base leg, continue to look out and maintain traffic separation.

The final leg – When on the final leg, confirm that the runway is clear for your landing.

Go around – When you elect to abort a landing you should manoeuvre to keep other traffic in sight, maintain a safe distance from all aircraft and re-join the circuit when it is safe to do so. This may involve manoeuvring to the right, left or maintaining the runway centreline, depending on traffic, the circuit direction and terrain.

Figure: Suggested go-around manoeuvre



Straight-in approaches at non-controlled aerodromes

(CASR 91.395)

Before commencing a straight-in approach, you must determine the wind direction and the runways in use at the aerodrome.

Unless you are carrying out an instrument approach in instrument meteorological conditions (IMC) or an approach in a specific Part 103 aircraft, you must complete your manoeuvring and be established on final approach by at least 3 NM from the threshold of the runway you intend to use for the landing.

The aircraft making the straight-in approach must give way to any other aircraft flying in the circuit pattern for the aerodrome.

Exception: *The following Part 103 aircraft need not comply with the requirement to be established on final approach by 3 NM:*

- *sailplanes (except for powered sailplanes including touring motor gliders, and power-assisted sailplanes, when the engine is operating)*
- *hang gliders and paragliders (whether or not power-driven).*

The exception is necessary since compliance with the 3 NM straight-in rule would expose slower Part 103 aircraft to a collision risk from faster overtaking aircraft. Part 103 aircraft are therefore permitted to establish on a short final approach within 3 NM of the runway threshold.

If you choose to adopt a straight-in approach you should only do so when it does not disrupt or conflict with the flow of circuit traffic. You must give way to any other aircraft flying in the circuit pattern. Nonetheless, when conforming to the circuit pattern, particularly on the base leg, you should continue to check for traffic entering along the final approach path.

Except when piloting a Part 103 aircraft, you must be established on final approach at not less than 3 NM from the landing runway threshold.

You should announce your intention to conduct a straight-in approach with your inbound broadcast. A further broadcast of your intentions should also be made when not less than 3 NM from the runway threshold.

You should not commence a straight-in approach to a runway when the reciprocal runway is being used by aircraft already established in the circuit.

You should only make minor corrections to speed and flight path, to maintain a stable approach, within 3 NM on final approach. Your aircraft's transponder should be selected to ON/ALT (Mode C). Your aircraft's external lights (where fitted) should be illuminated and remain on until the aircraft has landed and is clear of all runways.

You must remember that an aircraft established on the base or final leg for any runway has right of way over an aircraft carrying out a straight-in approach.

See **AC 91-10 – Operations in the vicinity of non-controlled aerodromes.**

Joining on base leg – You should be mindful that the following types of incidents are more common when joining on the base leg:

- landing downwind in direct conflict with other traffic using the into-wind runway
- having to go around from a late final approach due to other aircraft or vehicles on the runway
- landing on a closed runway or at a closed aerodrome.

Joining on the base leg is not a standard procedure. CASA recommends that you join the circuit on either the crosswind (midfield) or downwind leg. However, if you do choose to join on base leg should only do so if you:

- have determined the:
  - wind direction and speed
  - runway in use
  - circuit direction
  - presence of obstructions on the runway
  - serviceability of the aerodrome and runway
- give way to other circuit traffic and ensure the aircraft can safely (no traffic conflict likely) join the base leg applicable to the circuit direction in use at the standard height, and
- broadcast your intentions.

Note: Base-leg joins must be conducted in accordance with the circuit directions as published in the ERSA. If joining on the base leg cannot be conducted to meet the above criteria, pilots should descend on the non-active side of the circuit.

Taxi after landing – After landing, vacate the runway strip as soon as practicable. You should not stop your aircraft until clear of the runway strip.

Transiting flights – If you prefer to track via non-controlled aerodromes for risk mitigation or other purposes, you should avoid overflying the aerodrome at an altitude that could conflict with operations in the vicinity of the aerodrome. Be aware, however, that IFR approach procedures may commence at significant heights above the aerodrome (for example 4,954 ft at Innisfail).

If you determine that you are flying at a height that is within the vicinity of an aerodrome that requires the carriage of a radio, you must monitor and broadcast your position on the CTAF (CASR 91.375).

VFR pilots can find information on IFR approach procedures on the Airservices Australia website at **airservicesaustralia.com/aip/aip.asp**.

Call Airservices Service Desk for assistance on 1800 801 960.

Traffic mix (AC 91-10)

Non-controlled aerodromes can host a variety of operations including passenger air transport in large jet and turboprop aircraft, as well as glider, parachute, helicopter, gyroplane, ultralight, balloon and agricultural operations. This diversity presents a range of potential safety risks that are mitigated through the adoption of a standard code of conduct and good flying.

Turboprop or jet aircraft passenger operations – At certain non-controlled aerodromes, regular public transport passenger, corporate and air transport companies may use large turboprop or jet aircraft. These aircraft may have different operating parameters/criteria to those of many general aviation aircraft. They fly under IFR and are generally operated in accordance with company SOPs. Pilots of large aircraft flown at slow speeds with a high nose angle may find it difficult to see other smaller aircraft below their flight path, particularly on approach. These aircraft will broadcast their intentions, but it is essential that pilots of smaller aircraft also make and respond to broadcasts and do not simply assume that the larger aircraft is aware of their position.

General aviation pilots should be aware that, in certain circumstances, passenger transport aircraft may not be able to use the active runway. Passenger transport aircraft must operate under more stringent regulations, including specific aircraft performance regulations. For example, an aircraft may depart downwind, accepting an increased take off distance because of a performance limitation imposed by terrain clearance requirements on the active runway. Similarly, landing into wind may not always be possible when relevant performance limitations are taken into account.

Glider operations – These can be conducted from normal runways associated with an aerodrome, or from adjacent sites within the confines of an aerodrome. Gliders can be launched using a variety of methods including aero tow, vehicle tow, self-propulsion and winch launch. In all cases, vehicles and people may be operating on, or in the vicinity of, the runways in use.

A double white cross displayed adjacent to the windsock indicates that gliding operations are in progress. Aeronautical charts also use the double cross to indicate areas where glider operations take place. Some gliders operating adjacent to the CTAF area may use a different frequency to the CTAF or area frequency.

Winch operations may occur at any aerodrome and launch gliders to 4,000 ft AGL, although the typical height is between 1,500 and 2,000 ft AGL. Pilots should be aware of winch wires up to these levels, particularly when overflying the aerodrome, and check ERSA and the latest NOTAMs for current, specific operational information.

Gliders landing on the active runway may not be able to give way to other aircraft. At aerodromes with both glider and helicopter operations, helicopter pilots should follow the standard traffic patterns to avoid gliders which may be flying modified circuit patterns.

See Sport and recreational aviation section in this Chapter.

Parachuting operations – Aeronautical charts depict parachute symbols at aerodromes where known parachute operations occur. ERSA also details the aerodromes where parachute operations take place. Pilots should consult the latest NOTAMs for any additional information.

In Australia, parachuting operations are permitted through cloud in certain circumstances.

Pilots flying parachuting operations will broadcast on all relevant frequencies. For example, if the jump commences in Class G airspace and will land at a non-controlled aerodrome, advisory calls will be made on both the area frequency and the CTAF.

Parachutists in free-fall are almost impossible to see, so pilots are advised to avoid overflying an aerodrome with an active drop zone. Communication with the parachuting drop aircraft is essential to avoid flying into a drop zone area.

See Sport and recreational aviation section in this Chapter.

Helicopters and gyroplanes operations – Helicopters can arrive at and depart aerodromes in various directions. Helicopter pilots can choose to fly a circuit similar to a fixed-wing aircraft, but may also fly a circuit either in or contra to the circuit direction at a height of at least 500 ft above the aerodrome elevation and closer to the runway. This can only be done if the associated landing site is outside the runway strip in use; the non-standard circuit does not cross the extended centreline of the runway in use and pilots broadcast their intentions. Check the relevant ERSA entry for any noise abatement procedures.

Helicopters may turn on to their departure heading at any height after take-off, provided it is safe to do so. When approaching to land at a marked helipad or suitable clear area, helicopter pilots should avoid the flow of fixed-wing aircraft. Helicopters must avoid other circuit traffic at all times.

Other pilots should be aware that, for some helicopter operations, the only suitable landing area is the runway.

Helicopters and gyroplanes fly more slowly than fixed-wing aircraft and approach to land at steeper angles. Both helicopters and gyroplanes can be expected to practise power-off landings (autorotations) which involve a very steep approach and high rate of descent.

As helicopter and gyroplane operations can be varied and flexible, pilots need to ensure that they monitor and advise other aircraft of their position and intentions by radio.

See Sport and recreational aviation section in this Chapter.

Ultralight aircraft – The term 'ultralight' aircraft, although they are part of the sport and recreational category of aircraft, is often used to describe aircraft with a maximum take-off weight of up to 355 kg with stall speeds that might be as low as 35 kts or for some aircraft even lower.

These sport and recreational aircraft types include trikes, powered parachutes, gyroplanes and other small fixed-wing aircraft that cruise at maximum speeds of about 55 kt. Pilots of these aircraft should conduct their standard circuit at 500 ft above aerodrome elevation.

Entry to the circuit should be at 500 ft above aerodrome elevation as it is normally impractical to overfly the field above all other circuit traffic. Joining the circuit at 500 ft above aerodrome elevation will ensure adequate separation from higher and faster traffic.

Pilots of these aircraft who choose to use the overfly procedure above the circuit altitude should be aware that:

- Ultralight aircraft are difficult to see, particularly by pilots of faster, larger aircraft.
- Faster, larger aircraft create significant wake turbulence that can be extremely hazardous to ultralight aircraft.
- Faster, larger aircraft will not be able to slow to the speeds of an ultralight aircraft to follow the ultralight.
- Faster, larger aircraft – before arriving in the circuit and when below 10,000 ft – can be operating at speeds up to 250 kt. Although aircraft should be operating at a maximum of 200 kt in the circuit, such an aircraft reporting at 20 NM from an aerodrome could be in the vicinity of the circuit within five minutes.

Ultralight pilots should consult the AIP, ERSA, relevant charts and the latest NOTAMs to obtain the most up-to-date information and procedures at their aerodrome.

See Sport and recreational aviation section in this Chapter.

Aerial application operations – Pilots should be aware that aerial application operations are conducted from some non-controlled aerodromes.

Aerial application operations frequently involve low-level manoeuvring after take-off and before landing. At non controlled aerodromes low-level manoeuvres do not have to conform to the standard traffic circuit. However, pilots of other aircraft can expect aerial application aircraft to:

› be fitted with a radio
› maintain a listening watch and broadcast their intentions on the CTAF
› give priority to other traffic.

Balloons – Aerodromes at which hot air balloons operate are marked on charts with the balloon symbol. Balloons, cannot of course, fly a circuit. Powered aircraft must give way to balloons.

Balloon pilots can operate within 3 NM of a non-controlled aerodrome if they hold any of the following:

› a current commercial pilot (balloon) licence
› a current CAR certificate of validation
› a current authorisation from CASA that endorses the holder for flight within 3 NM of a non-controlled aerodrome.

Balloons may approach the aerodrome on a different track to the one they intend for landing to take advantage of changing wind directions at different altitudes. Not all landings are from straight-in approaches and other pilots should be aware that the balloon may change direction quite quickly as it descends.

See Sport and recreational aviation section in this Chapter.

Remotely piloted aircraft (RPA)

Pilots should be aware that RPA operations may be conducted from controlled and non-controlled aerodromes.

RPA operations frequently involve low-level manoeuvring after take-off and before landing. These low-level manoeuvres do not have to conform to the standard traffic circuit. However, pilots of other aircraft can expect RPA to separate from other traffic.

RPA may maintain a listening watch and broadcast their intentions on the CTAF.

RPA may be equipped with surveillance equipment.

The rules governing these operations including provisions for aircraft separation are set out in CASR 101 and MOS 101.

Hazards (AC 91-10)

Aircraft size and performance – General aviation pilots should be aware that aerodromes with runways of 1,400 m or more in length can accommodate jet or large turboprop aircraft operations. Runway lengths are published in ERSA.

For aerodromes with high-performance traffic in the circuit, the overfly height should be no lower than 2,000 ft above aerodrome elevation.

Downwind take-offs and landings – Take-off or landing downwind is not recommended as a standard procedure. Pilots should use the runway most closely aligned into wind (the active runway), wherever possible.

Pilots must operate within the limitations prescribed in the AFM (CASR 91.095).

In accordance with CASR 91.410, pilots should consider the following hazards if planning to take off or land downwind:

- Wind strength just above ground level may be significantly higher than indicated by the windsock.
- Windshear (for take-off) may result in:
  - higher groundspeed at lift-off
  - a longer take-off distance required
  - a shallower angle of climb
  - degraded obstacle clearance
  - in the event of an emergency, (landing straight ahead) touchdown will be at a higher groundspeed.
- Windshear (for landing) may result in:
  - higher groundspeed at touchdown
  - a longer landing distance required.

Wake turbulence and windshear – Wake turbulence is produced by all aircraft and can be extremely hazardous. Smaller aircraft should be aware that large aircraft produce strong/severe wake turbulence, with large jet aircraft producing extreme wake turbulence.

In calm conditions, wake turbulence may not dissipate for several minutes. Pilots should position their aircraft with sufficient spacing in the traffic circuit to avoid encountering wake turbulence.

On take-off, smaller aircraft will normally require increased separation time before departing behind a larger aircraft.

Helicopters of all sizes produce, in forward flight, vortices similar to those produced by fixed-wing aircraft. A hovering or slow air-taxiing helicopter creates a rotor downwash that can be a hazard to all nearby aircraft. Therefore, pilots of small aircraft should avoid operating close to helicopters. Equally, helicopter pilots should operate at a safe distance from parked or taxiing aircraft.

Windshear can occur anywhere in the traffic circuit but is most dangerous when close to terrain. Dust devils ('willy willies') are visible windshear and common at outback aerodromes. Pilots encountering windshear should consider an immediate maximum-performance climb to fly out of the situation.

Collision avoidance at non-controlled aerodromes

The most hazardous area for collisions is within a space bounded by a cylinder of airspace 5 NM in diameter and up to 3,000 ft elevation above a non-controlled aerodrome. All pilots must maintain good situational awareness within this high-risk area.

Inbound pilots should minimise distractions within the cockpit. Passengers should be briefed not to distract the pilot unless there is imminent danger.

Pilots should be familiar with the aerodrome layout and have radio frequencies set, so their attention can be directed outside the aircraft. Pilots should be alert, looking for other traffic, maintaining a listening watch and responding appropriately to applicable transmissions. Pilots should broadcast their intentions by making the standard positional broadcasts and other broadcasts as necessary in the interests of safety.

Most collisions occur on downwind or on final approach. There are many distractions during this time, including configuring the aircraft, completing checklists, setting equipment and communicating. Early completion of checklists and configuration changes will help to minimise distractions at this critical time.

Good height and speed control (including use of flaps) is essential for maintaining separation during the approach. If adequate separation cannot be maintained, a go-around should be initiated sooner rather than later.

Pilots should have a sound understanding of the rules for establishing the right of way and preventing collisions. Refer Chapter 1 – know your rules and responsibilities for more detail.

The CASRs are published at **www.legislation.gov.au**

At aerodromes with both glider and helicopter operations, helicopter pilots should follow the standard traffic patterns to avoid gliders flying modified circuit patterns.

Maintaining separation in the vicinity of a non-controlled aerodrome

Increased collision risks exist at non-controlled aerodromes if instrument approaches are conducted at a time when visibility is reduced (by cloud, smoke or haze) but VFR conditions exist below the low-visibility layer.

In these situations, it is possible for a pilot flying an instrument approach through cloud to become visual and suddenly encounter a VFR aircraft in the circuit. Diligent radio broadcasting and continuous visual scanning are essential to avoid an airprox.

VFR pilots, on hearing IFR pilots broadcasting their intention to make an instrument approach, are expected to respond promptly to establish situational awareness with the IFR aircraft. Information that would be useful to the IFR pilot includes aircraft type, position and flight intentions.

VFR pilots should remember their responsibility to remain clear of cloud and maintain in-flight visibility in accordance with the criteria for VMC.

Practise instrument approaches. Pilots who wish to practise instrument approaches in VMC should be particularly alert for other aircraft in the circuit, so as to avoid impeding the flow of traffic.

Pilots flying IFR should give position reports in plain English so as to be easily understood by VFR pilots, who generally have no knowledge of IFR approach points or procedures. In general, positions should include altitude, distance and direction from the aerodrome. Details such as the outbound/inbound legs of an instrument approach, or area navigation fixes, will generally be of little assistance to VFR pilots in establishing situational awareness.

Surveillance information service (AIP GEN 3.3) (ENR1.4)

SIS is available, on request, to VFR flights in Class E and G airspace within ATS surveillance system coverage, subject to ATC workload. The SIS is available to improve situational awareness and assist pilots in avoiding collisions with other aircraft.

VFR pilots receiving a SIS will be provided with traffic information and, upon request, position or navigation information.

Note: All information is advisory in nature, and you remain responsible for the safe operation of the aircraft. Terrain clearance, aircraft-to-aircraft separation, and obtaining clearances into controlled airspace remain your responsibility.

Pilots wishing to receive a SIS must be in direct VHF communications with ATC and equipped with a serviceable SSR transponder or ADS-B transmitter. The pilot must maintain a continuous listening watch with ATC, advise ATC prior to any changes to track or level and advise prior to leaving the frequency.

VFR flights entering Class E airspace do not require a clearance, but may receive a SIS, where available, on request.

ATC will provide an alerting service for flights receiving an SIS.

On initial contact with ATC, you must advise the ATS surveillance service required and, if an ongoing service is requested, include the phrase **'Request flight following**'.

When ATC responds to this request, you must advise position, level and intentions.

The SIS commences on ATC notification of identification, and ATC may also assign a specific transponder code prior to, or during, the provision of the SIS.

If ATC is unable to provide a SIS, you will be advised **'Surveillance not available'**. Requests for emergency assistance should be prefixed by **'Mayday'** (three times) or **'Pan Pan'** (three times) and will receive priority.

If, the radar and/or ADS-B service is terminated, ATC will advise **'Identification terminated'** to indicate that the surveillance service is terminated.

Note: When an ATS surveillance service to a VFR flights is terminated, the pilot should monitor the ATS frequency appropriate to the area of operation.

If you have requested flight following, the SIS will be provided on an ongoing basis, generally limited to within the controller's area of responsibility. However, the SIS may be terminated at any time by the controller, or by your advice.
While receiving an SIS, the pilot must:

- maintain a continuous listening watch with ATC and advise prior to leaving the frequency
- advise ATC prior to any changes to track or level.

Approaching the boundary of the controller's area of responsibility, you will generally be advised **'identification terminated, frequency change approved'**. If a continued service is requested, you must advise **'request hand-off for flight following'** and, subject to the approval of the adjacent ATC unit, you will be instructed to change frequency for continuation of the SIS.

Alerting service (AIP GEN 3.3)

An alerting service will be provided:

- for all aircraft provided with ATC service
- in so far as practicable, to all other aircraft that have filed a flight plan or are otherwise known to the air traffic services.

Civil Aviation Safety Authority

Class E airspace procedures

In Class E airspace, the following traffic services are provided by ATC:

› IFR flights provided with an ATC service are separated from other IFR flights.
› IFR flights receive information about VFR flights as far as practicable.
› VFR flights receive SIS where available on request.
› Hazard alerts will be directed to pilots of known VFR flights.

Traffic information services provided by ATC do not relieve pilots of their responsibilities for continued vigilance to see and avoid other aircraft.

VFR flights in Class E airspace (AIP ENR1.1)

VFR flights entering Class E airspace do not require a clearance. VFR flights entering and operating in Class E airspace should:

› avoid published IFR routes, where possible
› monitor the appropriate Class E frequency and announce if in potential conflict
› take appropriate action to avoid potential conflict
› avoid IFR holding patterns.

Controlled aerodromes and controlled airspace

When operating at a controlled aerodrome (when ATC is active) you must obtain ATC clearance when:

- taxiing on any part of the manoeuvring area
- entering, crossing, or backtracking on, a runway
- taking off
- landing.

When taxiing on the manoeuvring area of a controlled aerodrome, you must stop and hold at all illuminated stop bars. You may only proceed beyond the stop bars when the stop bar lights are switched off.

Exception: *You may proceed beyond a lighted stop bar if ATC advises you that stop bar contingency measures are in effect for the lighted stop bar, and ATC has identified the relevant lighted stop bar to you by reference to the specific holding position and instructs you to cross it.*

Control zones and areas – entry into Class A, C or E airspace (CASR 91 MOS 11.14)

You must not enter a control zone or a control area that is Class A, C or E airspace without ATC clearance. You must not fly under the VFR in Class A airspace unless you hold an approval (CASR 91.285).

Exception: *VFR flights do not require clearance to enter Class E airspace.*

Exception: *A clearance is not required when an ATC service is not in operation for a control zone.*

Control zones and areas – entry into Class D airspace (CASR 91 MOS 11.15)

You must establish communication with the relevant ATC tower, if ATC is active, before you enter Class D airspace.

Control zones and control areas – operating in Class A, C, D or E airspace (CASR 91 MOS 11.16)

When flying in a control zone or a control area, you must fly in accordance with the following procedures and as published in the AIP and take positive action to regain the cleared track as soon as you recognise a deviation.

You must also notify ATC if the aircraft's deviation from track exceeds any of the following tolerances:

- for PBN operations – 1 x the required navigation performance (RNP) value for the route or route segment being flown
- VOR, or non-directional beacon (NDB)-based operations – ± 5° from the specified bearing
- for localiser (LOC)-based operations – full-scale deflection of the course deviation indicator
- for distance measuring equipment (DME)-based operations – ± 2 NM from the required arc
- for operations based on visual navigation – 1 NM from the cleared track.

Relevant procedures and navigational requirements for operations in a control area or control zone are published in the AIP. These publications are available through the Airservices Australia website: **www.airservicesaustralia.com**.

Clearances for entry into a controlled area

All flights operating in Class E or G airspace requesting a clearance to operate in Class C or D airspace must advise position, level, flight conditions if appropriate and receipt of ATIS (code) when making first contact with ATC.

Within VHF radio coverage, pilots must maintain continuous communications with ATC when operating in Class C and D airspace. Further, when in Class E airspace, pilots of VFR flights should monitor the ATS frequency appropriate to their area of operation.

When communication facilities permit, clearances will be passed directly to you by ATC .

When direct communication on the published frequency is not possible you should request a clearance through the ATS unit providing services in the preceding non-controlled airspace.

If proposing to fly into a control area from an aerodrome located so close to the entry point that making a full position report before entry is not practicable, you should request a clearance:

› prior to entering the runway, where direct communication is available

› after take-off, provided that the aircraft does not enter a control area until cleared, or

› prior to landing, when intending to depart for controlled airspace shortly after landing.

Clearance amendments

An air traffic clearance provided by ATC does not relieve you from responsibility for the ultimate safety of the aircraft. If considered necessary, you should request a different clearance from that issued.

In an emergency, you may act without a clearance and where possible you must advise ATC.

A pilot must advise ATC if issued a clearance which requires the use of navigation aids not available to the aircraft, or that the pilot is not qualified to use.

ATC is responsible for issuing clearances that will enable an aircraft to remain within controlled airspace if the pilot has planned to do so. If a pilot is in doubt that the clearance will keep the aircraft in controlled airspace, ATC should be advised, and an alternative clearance may be requested.

For operations within Class C, D or E airspace, maintaining 500 ft above the lower limit of the CTA steps will provide a vertical buffer with aircraft operating in the adjoining airspace.

A control instruction issued after a clearance is obtained amends the appropriate item in the clearance. When there is any change in the clearance limit and/or route specified in the initial clearance, a completely new clearance will be issued.

Whenever a clearance restriction has been imposed, and a further restriction is subsequently issued, the subsequent instruction will cancel all previous clearance restrictions.

At a controlled aerodrome, clearance for operation in an adjoining control area is given before departure.

If proposing to fly into a control area from an aerodrome located so close to the entry point that making a full position report before entry is not practicable, a clearance should be requested:

› at a convenient time before entering the runway for take-off at an aerodrome where communication can readily be established before take-off, or

› after take-off, if not available or obtainable before take-off, provided that the aircraft does not enter the control area until cleared.

If landing at an aerodrome with the intention of departing for a control area shortly after landing, any revision of notified details relevant to the clearance, including estimated off-blocks time (EOBT), should be advised to ATC, and a clearance requested before landing.

Pilots should submit details required for flight in controlled airspace at least 30 minutes before the expected time of entry. Flight details submitted with less than 30 minutes notification will be processed on a 'controller workload permitting' basis and may be subject to delay.

Within a Class D CTR, a clearance to take off is a clearance to operate within the CTR.

Separation in controlled airspace (AIP ENR 1.4)

In Class C airspace, ATC provides separation as follows:

› between IFR flights

› between IFR and VFR flights

› between IFR and special VFR flights

› between special VFR flights when the visibility is less than VMC.

Additionally, in Class C and Class D airspace:

› appropriate runway separation is applied to all aircraft at controlled aerodromes

› ATC provides VFR flights with traffic information on other VFR flights.

Furthermore, when requested, and as far as is practicable, ATC will provide VFR flights in Class C airspace with a suggested course of action to avoid other VFR flights.

Special provisions (AIP ENR 1.4)

The separation of aircraft taxiing on the manoeuvring area (which does not include apron and parking areas) is a joint pilot and controller responsibility. The pilot must maintain separation while complying with clearances and instructions.

In the traffic circuit, pilots must position their aircraft so that, while complying with clearances and instructions from ATC, they maintain the necessary separation from other traffic.

Separation is not normally provided within a training area in controlled airspace.

Under certain conditions, the pilot of one aircraft may be given responsibility for separation with other aircraft. In this circumstance:

- The pilot is also responsible for the provision of wake turbulence separation.
- The pilot must advise ATC when they are unable to maintain, or have lost, sight of other aircraft.
- Where an aircraft has been instructed to maintain separation from, an IFR aircraft, ATC will issue traffic information to the pilot of the IFR aircraft, including advice that responsibility for separation has been assigned to the other aircraft.
- Aircraft flying in formation will not be provided with separation in respect to other aircraft of the same formation, including for take-off and landing.
- Aircraft flying as part of an in-company flight will not be provided with separation in respect to other aircraft of the same in-company flight while airborne. Runway separation will continue to be provided.

Traffic information in controlled airspace (AIP GEN 3.3)

In controlled airspace when a separation standard does not exist, ATC will provide traffic information to the aircraft concerned when, in the opinion of the air traffic controller, the proximity of the aircraft warrants this information.

The traffic information provided will contain as much information as is known and is necessary to assist the pilot in identifying the other aircraft. For example:

- type
- altitude
- position, either by:
  - clock reference
  - bearing and distance
  - relation to a geographical point, or
  - reported position and estimate, and
- intentions or direction of flight.

ATC provides relevant traffic information to aerodrome traffic to enable pilots, while complying with ATC instructions, to maintain separation from other aircraft.

At military aerodromes traffic conditions may preclude the transmission of a complete traffic information service to individual aircraft.

Civil Aviation Safety Authority

Engine start and taxi (AIP ENR 1.1)

You must request approval to start engines when the requirement is notified by:

› ATIS
› NOTAM
› AIP Supplement
› ATC, or
› ERSA.

Taxi clearance

Where ATIS is in operation at a controlled aerodrome, you must obtain the ATIS prior to taxiing, and advise ATC of the ATIS code when requesting taxi clearance.

Pilots of civil VFR training flights should advise 'dual' or 'solo' as appropriate when requesting clearance.

You must obtain a taxi clearance before moving on the manoeuvring area.

The taxi clearance regulates movement on the manoeuvring area. The separation of aircraft taxiing on the manoeuvring area is a joint responsibility between you and the controller. Taxi clearances will contain concise instructions and adequate information so you can:

› follow the correct taxi routes
› avoid collision with other aircraft and objects, and
› minimise the potential for the aircraft inadvertently entering a runway.

When vacating a holding bay, you are to give way to aircraft on the taxiway.

Avoidance of collision on apron areas is a joint responsibility between you and any assisting company ground personnel. Information about other aircraft moving on the same apron area will be provided by the ATC (where it exists as a discrete service).

A taxi instruction which contains a taxi limit beyond a runway must include a **'cross runway (number)'** instruction to cross that runway. When an aircraft is required to hold short of a runway intersecting the taxi route, ATC will issue a taxi instruction limit of the holding point associated with the intersecting runway.

An aircraft which has been issued with a taxi instruction limit of the holding point of a runway intersecting the taxi route, or which has been issued with an instruction to '**hold short'** of that runway must subsequently be issued with an instruction to **'cross runway (number)'**.

Aircraft required to hold short of a runway must hold at the appropriate runway holding position or the runway strip edge at the intersection of a crossing runway.

You must stop and hold at all illuminated stop bars. You may only proceed beyond the stop bars when the stop bar lights are switched off.

However, you may proceed beyond a lighted stop bar if ATC advises you that stop bar contingency measures are in effect for the lighted stop bar, and ATC has identified the relevant lighted stop bar to you by reference to the specific holding position and instructs you to cross it (Part 91 MOS 11.13).

If you wish to use less than the full length of the runway available, you should nominate the intention when requesting your taxi clearance.

ATC may offer an intersection departure and will advise the remaining runway length, if required.

If you are unfamiliar with the aerodrome, you should **'request detailed taxi instructions'**.

VFR aircraft wishing to depart without submitting flight notification must provide the following information on first contact with ATC:

- aircraft callsign and 'details' (wait for a response from ATC)
- destination and first tracking point
- preferred level
- identification of ATIS code received.

Provision of operational information

ATC will supply the following information for take-off:

- runway or direction
- wind direction and speed, QNH and, if required, temperature and/or dew point
- a time check to the nearest half-minute, upon commencing taxi from the apron before take-off
- the crosswind component on the runway to be used, if this equals or exceeds 8 kt for single-engine aircraft or 12 kt for multi-engine aircraft
- the tailwind component
- aerodrome surface conditions significant to the operation
- known weather information
- birds that may be a hazard to the operation
- maintenance work within 23 m of the runway side-stripe marking.

Nomination of runways

ATC will nominate the runway, preferred runway or take-off direction. Where noise abatement procedures are prescribed and ATC traffic management permits, the provisions of DAP noise abatement procedures (NAP) will be applied. ATC shall not nominate a particular runway for use if an alternate runway is available, when:

- the alternate runway would be preferable due to low cloud, thunderstorms and/or poor visibility
- for runways that are completely dry:
  - the crosswind component, including gusts, exceeds 20 kt, or
  - the downwind component, including gusts, exceeds 5 kt, and
- for runways that are not completely dry:
  - the crosswind component, including gusts, exceeds 20 kt, or
  - there is a downwind component.

Take-off (AIP ENR 1.1)

Selection of take-off direction

You must ensure that the runway is suitable for your operation. If not suitable, you must advise ATC before taxiing or when requesting an airways clearance by using the phrase **'Require runway (number)'**.

Such a request will not result in a loss of priority, provided it is made on first contact with clearance delivery or before taxiing. The decision to take off rests solely with you as the pilot in command.

Selection of circuit direction

Circuit directions and turns will be specified or authorised by ATC. You must notify ATC if a particular turn or circuit is essential to the safe operation of your aircraft by use of the word **'Require'**.

Departure instructions

Departure instructions may contain the following, as required:

› aircraft identification
› direction of turn and heading instructions*
› altitude restrictions
› tracking points, and
› any other instructions.

*For an assigned heading (including runway heading) you must not compensate for wind effect.

When a heading is assigned as a departure instruction, you must read back the heading and the direction of the turn.

Change to tower frequency

Domestic aircraft should change to tower frequency:

› close to, or at, the holding point of the nominated runway, when ready for take-off, or
› in the holding bay if directed.

At Class D aerodromes at which parallel runway operations are in progress, you must identify the departure runway when reporting ready, for example: **'(Callsign) ready, runway right'**.

For operations wholly within a Class D CTR you must report ready with intentions, for example: circuits, training area north, etc. Additionally, for aircraft not in receipt of airways clearance that will depart the Class D CTR, advise tracking details, for example: **'Departing via (location) for (location), departure procedure, etc.'**

Runway entry

You must not enter an active runway unless you have received a specific clearance to:

› take-off
› line up, or
› backtrack, or
› cross; or
› a clearance to enter for other purposes has been received from ATC and the stop bar lights, where fitted, have been switched off.

An ATC clearance to line up does not authorise you to backtrack on the runway. When a backtrack on the runway for take-off is required, you must indicate your intention to ATC and obtain a clearance to backtrack prior to entering the runway. When a backtrack on the runway will involve crossing an intersecting runway, the backtrack instruction must include either a **'Cross runway (number)'** instruction or an instruction to **'Hold short'** of that runway.

Aircraft required to hold short of a runway must hold at the appropriate holding point, or the runway strip edge at the intersection of a crossing runway.

An aircraft which has been issued with an instruction to **'Hold short'** of an intersecting runway must subsequently be issued with an instruction to **'Cross runway (number)'**.

Holding on the runway

You must not hold on the runway in use unless permission to do so has been obtained from ATC.

Clearance required

You must not take off unless the specific clearance **'Cleared for take-off'** has been received.

A clearance for immediate take-off may be issued to an aircraft before it enters the runway. On acceptance of such clearance the aircraft should taxi out to the runway and take off in one continuous movement.

After take-off

Airborne report – Class C control zones (AIP ENR 1.1)

In Class C and Class D control zones where an ATS surveillance service is provided, on your first contact with centre, approach or departures, you must report:

- if assigned an initial heading – the direction of turn and assigned heading
- the altitude passing, to the nearest 100 ft
- the last assigned level.

Frequency change

When frequency change instructions are issued immediately preceding the take-off clearance, you must change frequency automatically from the tower frequency as soon as practicable after take-off, preferably within one nautical mile of becoming airborne.

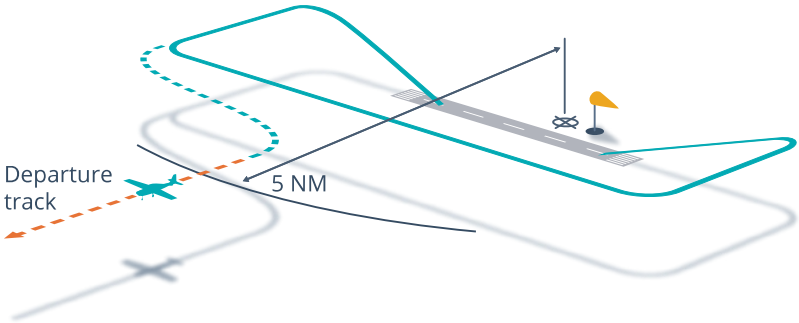
In all other situations, when departing you must remain on tower frequency until specific frequency change instructions are issued. You can generally expect an instruction to contact departures control before reaching 2,000 ft and should, when advised, effect the change as soon as possible.

When contacting area control, you must advise the last assigned level and, if not maintaining the assigned level, the level you are maintaining or the last vacated level.

Note: The 'last vacated level' may be omitted by identified aircraft squawking pressure altitude derived level information.

Establishment on track

Unless otherwise instructed by ATC, you must remain within 5 NM of the departure aerodrome to establish flight on the departure track as soon as practicable after take-off.



Deviations from route or track

In controlled airspace, any deviation from route or track requires prior clearance from ATC, except in an emergency. The values given in previous paragraphs must not be interpreted as tolerances within which deviations from route or track without clearance are permitted.

Deviations due to weather

In controlled airspace, any diversion from route or track due to weather requires prior clearance from ATC. If unable to obtain a clearance (for example, due to being out of radio contact) and you consider that the deviation is necessary (see AIP ENR 2.2), a PAN call specifying details of the deviation must be broadcast on the appropriate frequencies.

> **'Pan Pan, Pan Pan, Pan Pan, Zulu Foxtrot Romeo, 15 nautical miles south of Normanton, 8500, is descending immediately to 500 feet to avoid cloud'.**

You must be aware that the declaration of an emergency does not guarantee the aircraft safe passage, especially if the deviation is into an active restricted area.

Completed deviations from cleared route

When clearance has been issued to deviate from a cleared route, you must advise ATC when the weather deviation is no longer required, or when the weather deviation has been completed and the aircraft has returned to its cleared route. Further deviations from route will require a new clearance.

Change of level in controlled airspace (AIP ENR 1.7)

You must commence a change of level as soon as possible, but no later than one minute after receiving that instruction from ATC, unless that instruction specifies a later time or place. ATC may require that an assigned level must be reached by a specific time, distance or place. If you doubt that the requirement can be met, advise ATC immediately.

A requirement to report at a time or place given in the same clearance as a descent/climb instruction does not require the new level to be reached by the specified time or place.

When operating in controlled airspace you must report:

- when the aircraft has left a level at which level flight has been conducted in the course of a climb, cruise or descent
- when the aircraft leaves a level for which ATC has requested a report.

ATC may provide vertical separation between two climbing aircraft, not otherwise separated, by means of a step-climb. Pilots, who are subjected to a step-climb, must adopt the following procedure:

› The pilot of the lower aircraft must report approaching each assigned level in the sequence.

and

› The pilot of the higher aircraft, on hearing the lower aircraft report approaching each assigned level, must report the last vacated level.

Step-descents are the reverse of the above paragraphs. ATC may specify a rate of climb or descent. Other considerations are as follows:

› The phrase 'STANDARD RATE' when included in a clearance, specifies a rate of climb or descent of not less than 500 ft per minute, except that the last 1,000 ft to an assigned level must be made at 500 ft per minute.
› In the case of a step-climb or descent, the specified rate will be applicable to all level clearances issued during the step-climb or descent. If unable to comply with the prescribed rate, the pilot in command must advise ATC.

Block levels (AIP ENR 1.7)

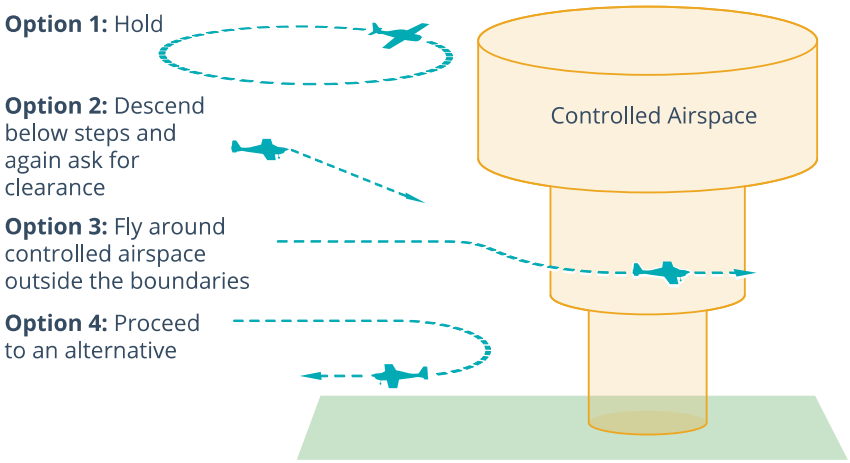
At the pilot's request, a flight may be cleared to operate within controlled airspace within a block level—provided that other aircraft are not denied the use of airspace within that block. A glider or balloon cleared to operate in controlled airspace will be assigned block levels.

The pilot has complete freedom to change levels within the block, provided that the upper and lower levels are not exceeded. However, a clearance to operate within a block level will be cancelled or amended if another aircraft requests the use of a level within the block.

When cancelling or amending a block level clearance, the aircraft operating in a block level will be instructed to climb or descend to an appropriate level or block level to provide vertical separation from other aircraft requesting one of the levels. Aircraft at standard flight levels will be afforded priority over aircraft using non-standard flight levels.

Holding (AIP ENR 1.5)

Pilots awaiting clearance to enter controlled airspace may choose one of the options below.



When instructed to hold in accordance with an ATC clearance, ATC will normally assign aircraft estimated to arrive first over a holding fix, or first able to commence an approach, the lowest available level for assignment.

Where a delay of six minutes or more is expected, ATC will advise an expected approach time or expected landing time.

When operationally necessary, if you are holding you must advise ATC of the latest divert time.

When you are holding because weather conditions are worse than the prescribed landing minima, ATC will nominate scheduled reporting times, normally at 15-minute intervals.

At the time or position advised, you must depart from the hold. You should leave the holding fix on time, or up to one minute ahead of time, and unless identified, report leaving the holding fix.

Arrival (AIP ENR 1.1)

VFR flights entering Class C airspace

Before reaching the boundary of Class C airspace, you must establish two-way communications with ATC on the frequency notified on the chart, in ERSA, or AIP Supplement or NOTAM, and obtain a clearance.

When advance notification has not been provided, you must advise, before the point of entry, the following to ATC:

- '(Aircraft callsign) inbound/transit details' – wait for ATC to respond with your callsign, and then advise:
  - flight rules and aircraft type
  - position
  - route and next estimate
  - preferred level.

If landing at an ATIS-provided aerodrome, you should obtain the ATIS before the first contact on the approach frequency. On first contact, advise ATIS received.

The clearance to enter will specify the altitude, track and any holding instructions. Some of these items may be combined with the clearance **'Cleared for visual approach'**.

Visual approach (AIP ENR 1.1)

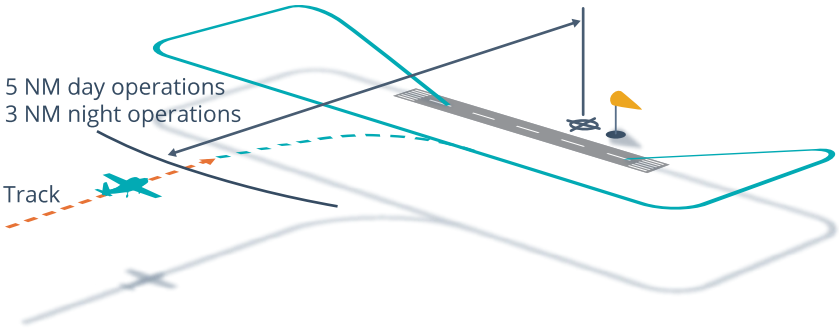
ATC authorisation

For a VFR flight by day or night ATC may give you a visual approach when you are within 30 NM of the aerodrome.

Tracking requirements

Tracking requirements for a visual approach include the following:

- you must maintain track/heading on the route progressively authorised by ATC until:
  - by day – within 5 NM of the aerodrome, or
  - by night – for a VFR flight, within 3 NM of the aerodrome and the aerodrome is in sight
- from this position you must join the circuit as directed by ATC for an approach to the nominated runway.



Minimum altitude requirements (CASR 91.265 and 91.277)

For VFR flights during a visual approach, you must descend as necessary to:

- by day – not operate below the lowest altitude permissible for VFR flight (CASR 91.265)
- by night – maintain not less than the lowest altitude permissible for VFR flight (CASR 91.277) until the aircraft is within 3 NM of the aerodrome and the aerodrome is in sight.

When you are making a visual approach, you must not climb above an altitude reported to ATC as having been reached or left, unless authorised to do so.

You may be assigned the responsibility to follow another arriving aircraft which you have reported sighting. You must maintain separation from and not overtake that aircraft. In this circumstance, you are also responsible for providing your own wake turbulence separation. You must advise ATC immediately, if you lose sight of the other arriving aircraft.

Landing (AIP ENR 1.1)

Provision of operational information

ATC will supply the following information for landing operations:

- runway or direction
- wind direction and speed, QNH and, if required, temperature and/or dew point
- known significant weather information, including low cloud and visibility or runway visual range (RVR)
- a time check (to the nearest half minute), whenever a time to commence final is specified by ATC
- the crosswind component on the runway to be used, if this equals or exceeds 8 kt for single-engine aircraft or 12 kt for multi-engine aircraft
- the tailwind component
- aerodrome surface conditions significant to the operation, including maintenance work within 23 m of the runway sidestrip marking
- birds and other hazards to aircraft, and
- cautionary advice of wake turbulence.

Selection of landing direction

You must ensure that the nominated runway or direction is operationally suitable. If it is not suitable, you must advise ATC using the phrase **'Require runway (number)'**. Such a request will not result in of loss of priority provided that it is made:

- before reaching 80 NM (120 NM for jets) from a capital city aerodrome (including Essendon) or 30 NM from other controlled aerodromes, for arriving aircraft wholly within controlled airspace, or
- on first contact with ATC for arriving aircraft entering controlled airspace within the distance specified above or a control area step or a control zone.

The decision to land rests solely with you as the pilot in command.

Selection of circuit direction

You must notify ATC if a particular turn or circuit is essential to the safe operation of the aircraft. The word **'require'** must be used to enable ATC to identify the safety requirement.

Unless otherwise instructed by ATC, if you are arriving or circuit training you must report **'downwind'** when starting or entering the downwind leg of the traffic circuit. If frequency congestion prevents the call being made when starting the downwind leg, you must report **'mid-downwind'** or **'late-downwind'** as appropriate.

Landing clearances

You must not land unless you receive specific clearance **'Cleared to land'**.

Go-around procedure in VMC

Except as specified in ERSA for specific aerodromes, if an aircraft is required to go around from a visual approach in VMC, the aircraft must initially climb on the runway track, remain visual and await ATC instructions. If the aircraft cannot clear obstacles on runway track, the aircraft may turn.

At Class D aerodromes with parallel runways where contra-rotating circuit operations are in progress, if ATC instructs, or you initiate a go-around, you must:

- commence climbing to circuit altitude
- position the aircraft on the active side and parallel to the nominated duty runway, while maintaining separation from other aircraft
- follow ATC instructions or re-enter the circuit from upwind.

Taxiing after landing

You must not hold on the runway in use unless ATC has cleared you to do so.

After landing, unless specified otherwise by ATC, you must comply with the following requirements:

- promptly vacate the runway without backtracking
- change from the aerodrome frequency to the surface movement control (SMC) frequency (where established) when vacating the runway strip and obtain an ATC taxi instruction
- not cross any runway that intersects the taxi route unless in receipt of a taxi instruction and a 'Cross runway (number)' instruction from ATC
- taxi to the destination via the most direct taxiway(s) available, and
- where an apron service is provided on a discrete frequency (see ERSA), change to that frequency on entering the apron.

A taxi instruction which contains a taxi limit beyond a runway must include a **'Cross runway (number)'** instruction to cross that runway. When an aircraft is required to hold short of a runway intersecting the taxi route, ATC will issue a taxi instruction limit of the holding point associated with the intersecting runway.

When you have been issued with a taxi instruction limit of the holding point of a runway intersecting the taxi route or have been issued with an instruction to 'Hold short' of that runway, you must subsequently be issued with an instruction to **'Cross runway (number)'**.

When you are required to hold short of a runway you must hold at the appropriate holding point for that runway, or the runway strip edge at the intersection of a crossing runway.

When separate frequencies for aerodrome control and surface movement control are in use, on landing, you must change from the aerodrome control frequency to the SMC frequency on vacating the runway strip, and then transmit the aircraft callsign and, if applicable, parking bay number. You may **'Request detailed taxi instructions to (location)'**.

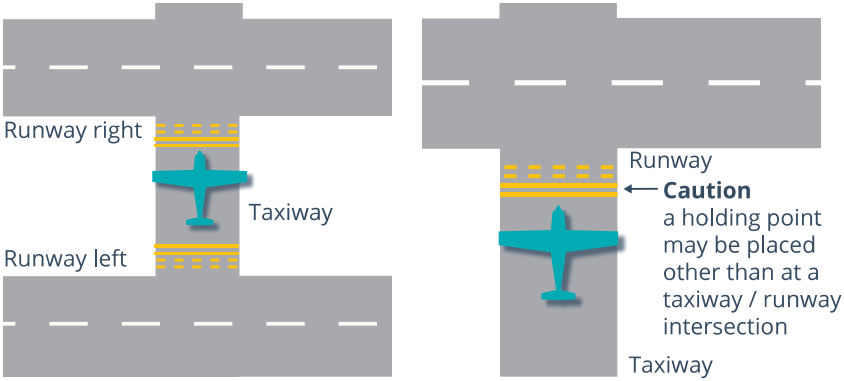
The taxi clearance regulates movement on the manoeuvring area.

The separation of aircraft taxiing on the manoeuvring area is a joint responsibility between you and the controller. A taxi clearance shall contain concise instructions and adequate information to assist you to follow the correct taxi routes, to avoid collision with other aircraft and objects and to minimise the potential for the aircraft inadvertently entering a runway.

A taxi clearance will not relate to movement on the apron areas. However, available essential information referring to other aircraft entering or leaving the same apron area will be provided.

Radio watch must be maintained on the SMC or tower frequency (where no SMC frequency is provided) until parked.

Figure: Taxiing aircraft holding short



Class D operations (AIP ENR 1.1)

Class D airspace is controlled airspace where an air traffic control service is provided to aerodrome traffic. The service is procedure-based.

You should read the procedures outlined in this chapter in conjunction with the controlled airspace procedures. There are some minor differences to procedures in Class D airspace.

An air traffic control service will be provided.

Except in an emergency, a clearance is required for all flights in Class D airspace.

When Class C and D airspace adjoin laterally, flights at the common boundary will be given services applicable to Class D airspace.

Consult ERSA, NOTAM and CASA's interactive guide to operations in controlled airspace – OnTrack, for procedures specific to a Class D aerodrome.

Class D aerodromes have a high traffic density that includes a wide variety of aircraft types and performance capabilities. Typical users of these aerodromes include private, aerial work and air transport aircraft, with a mix of circuit training as well as arrivals and departures. You should ensure you maintain a good lookout while flying in, and before reaching, Class D airspace. You should also maintain a good listening watch on the relevant radio frequency to ensure you receive aircraft and ATC communications, to maintain situational awareness of other traffic.

For entry into Class D airspace, establishment of two-way communications between the aircraft and ATC constitutes a clearance for you to enter Class D airspace (AIP ENR 1.1).

- You should plan your entry to the aerodrome in Class D airspace via the VFR reporting point identified on the visual terminal chart (VTC).
- When flying from an aerodrome in Class D airspace delays might be incurred because clearances must be coordinated between different ATC sectors.

Class D airspace requirement

Map depiction

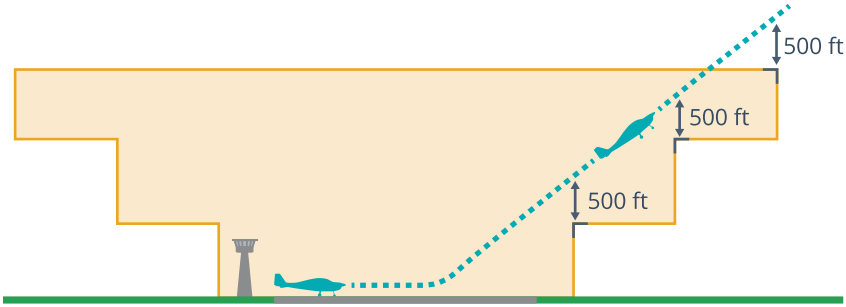
The lateral limits of Class D control area steps are depicted with blue lines and a blue tint. The vertical limits of Class D are shown with blue labels (AIP GEN 3.2). Control zones have defined dimensions, and associated control area steps, with an upper limit of 4,500 ft (AIP ENR 1.4 (Class D)).

Radio requirements (CASR 91 MOS 21.05)

You must maintain two-way communications with the relevant ATC control tower whenever operating in Class D airspace (AIP ENR 1.4) (MOS 21.05). For entry into Class D airspace, establishing two-way communications between the aircraft and ATC constitutes a clearance for you to enter the Class D airspace (AIP ENR 1.1).

Control area protection

For operations within Class C or D airspace, maintaining 500 ft above the lower limit of the CTA steps will provide a vertical buffer with aircraft operating in the adjoining airspace (AIP ENR 1.1).



Operating requirements for transponders

If your aircraft is fitted with a serviceable Mode 3A or Mode S transponder you must always have the transponder on Code 3000 or any assigned discrete code during flight in Class D airspace. If the transponder is Mode C capable, that mode must also be operated continuously (AIP ENR 1.6).

Traffic information in controlled airspace (AIP GEN 3.3)

In controlled airspace, when a separation standard does not exist, ATC will provide traffic information to the aircraft concerned when, in the opinion of the air traffic controller, the information is warranted by the proximity of the aircraft.

The traffic information provided will contain as much information as is known and necessary to assist the pilot in identifying another aircraft, for example:

- type
- altitude
- position, either by:
  - clock reference
  - bearing and distance

  - » relation to a geographical point, or
  - » reported position and estimate, and
- › intentions or direction of flight.

Separation (AIP ENR 1.4)

In Class D airspace

- › IFR flights are separated from other IFR and special VFR flights.
- › IFR flights receive traffic information in respect of VFR flights.
- › VFR flights receive traffic information in respect of all other flights.
- › Special VFR flights are separated from other special VFR flights when visibility is less than VMC.

Speed limitations

Aircraft operating in Class D airspace are not to exceed:

- › 200 kt at or below 2,500 ft above aerodrome level (AAL) within 4 NM of the primary Class D aerodrome
- › 250 kt when operating in other parts of Class D airspace.

Taxiing and manoeuvring

The separation of aircraft taxiing on the manoeuvring area is the joint responsibility of you and the controller. A taxi clearance from ATC is required before operating on the manoeuvring area (taxiways and runways of any controlled aerodrome). When ATC issues a taxi instruction, which includes a holding point, pilots must read back the words 'Holding point [holding point designator]'. Specific clearance is required to taxi, enter, cross or backtrack on a runway.

VFR flights wishing to depart without submitting flight notification must provide the following information on first contact with ATC:

- › aircraft callsign and 'DETAILS' and (wait for a response from ATC)
- › destination and first tracking point
- › preferred level
- › identification of ATIS code received.

These details may be given with the request for taxi clearance.

Within a Class D CTR, a clearance to take off is a clearance to operate within the CTR.

Change to tower frequency

Aircraft should change to tower frequency:

› in the holding bay, or

› close to, or at, the holding point of the nominated runway, when ready for take-off.

At Class D aerodromes at which parallel runway operations are in progress, you must identify the departure runway when reporting ready. For example: **'(Callsign) ready runway right'**.

You must not hold on the runway in use unless ATC has cleared you to do so.

Departure report

At certain Class D aerodromes where the tower also provides a procedural approach control service (see ERSA), you must report on the tower frequency after take-off:

› track information, and

› the last assigned altitude.

However, this report is not required:

› for VFR aircraft departing the control zone directly into Class G airspace, or

› for aircraft that have been instructed to contact Centre, Approach or Departures once airborne—in which case an airborne report will be made on the relevant frequency.

The departure time must be calculated as follows:

› current time minus an adjustment for the distance from the aerodrome, or

› when over or abeam the aerodrome.

En route (AIP ENR 1.1)

All levels flown in Class D airspace must be assigned by ATC, except when identified, position reports are required for all aircraft in Class D airspace.

Lanes of entry (AIP ENR 1.4)

Lanes of entry are established to permit passage to and from specified Class D CTRs without entering an adjacent civil or military control zone. The vertical limits provide separation from overlying control or restricted areas.

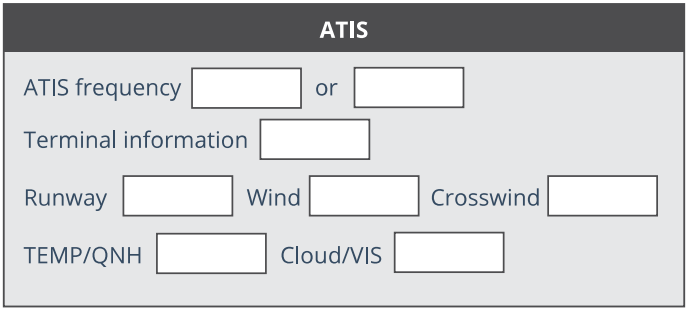
When using these lanes, pilots must:

- operate under VFR
- conform with the general flight rules regarding terrain clearance, flight over populous areas, and low-level restricted areas
- operate not higher than the altitude specified as the upper limit in the section being flown
- keep to the right.

Aeronautical ground lights may indicate visual lanes of entry at some Class D aerodromes. If present, these lights are identified on VTCs (AIP ENR 4.5).

Automatic Terminal Information Service (ATIS) (AIP ENR1.1)

If landing or taking off at an aerodrome where ATIS is provided, the pilot should obtain the ATIS before first contact on the tower frequency. On first contact, advise ATIS received, for example: **'Received information echo'**.



Inbound (AIP ENR 1.1)

Entry

Before entering Class D airspace, you must establish two-way radio communication with the tower on the frequency notified on the chart, in ERSA, or AIP Supplement or NOTAM. Thereafter, you must maintain those communications while in the Class D airspace.

All flights operating in Class E and G airspace requesting a clearance to operate in Class D airspace must advise position, level and tracking details when making first contact with ATC.

In establishing two-way communications, ATC may issue you with specific instructions that differ from the altitude and intentions you have already advised. You must comply with any such instructions issued by ATC.

You may be assigned the responsibility to follow another arriving aircraft which you have reported seeing. When assigned this responsibility, you must maintain separation from and not overtake that aircraft. In this circumstance, you are also responsible for providing your own wake turbulence separation. Advise ATC immediately if you lose sight of the other aircraft.

Initiating two-way communications

In initiating two-way communications, you must advise current position, altitude, intention, and any request(s).

Notes: Radio contact should be initiated far enough from the Class D airspace boundary to preclude entering the Class D airspace before two-way radio communications are established.

If the controller responds to a radio call with, '(Aircraft callsign) [(instructions)]' radio communications have been established and you may enter the Class D airspace.

If workload or traffic conditions prevent immediate entry to Class D airspace, the controller will tell you to remain outside the Class D airspace until conditions permit entry. For example: '(Aircraft callsign) remain outside Class D airspace'.

It is important to understand that if the controller responds to the initial radio call without using the aircraft callsign, radio communications have not been established and you may not enter the Class D airspace. For example, you may receive: 'Aircraft calling Archer tower, standby', or 'Aircraft calling Rocky tower, say again'.

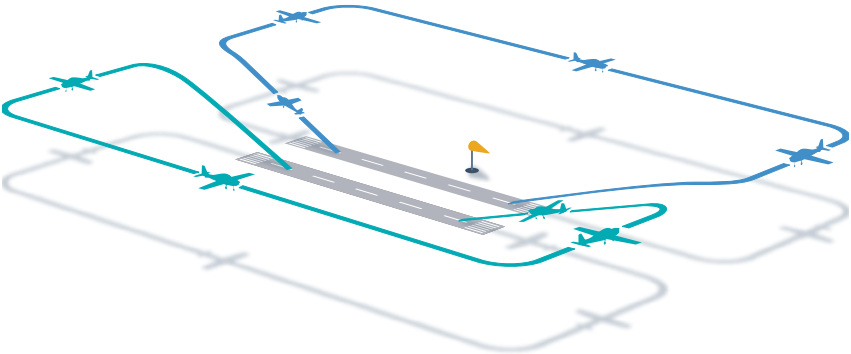
Track deviations

You must not deviate from the track, level and intentions stated during the establishment of two-way communications or the instructions issued by ATC (if these instructions modify the stated track, level and intentions), unless authorised by ATC (AIP ENR 1.1).

Unless ATC specifically instructs otherwise, establishing two-way communications permits you, when intending to land at an aerodrome within Class D airspace, to descend as necessary to join the aerodrome traffic circuit.

Parallel runway operations

Where a Class D aerodrome is equipped with parallel runways, ATC may sequence aircraft for simultaneous contra-circuits and may conduct these operations using separate tower frequencies for each runway. Operations will be regulated independently in each circuit, with an ATC clearance required to enter the opposite circuit or airspace (AIP ENR 1.1).



Clearances

You must not land unless the specific clearance **'Cleared to land'** (or **'Cleared touch and go'** or **'Cleared for the [option]'**) has been received (AIP ENR 1.1).

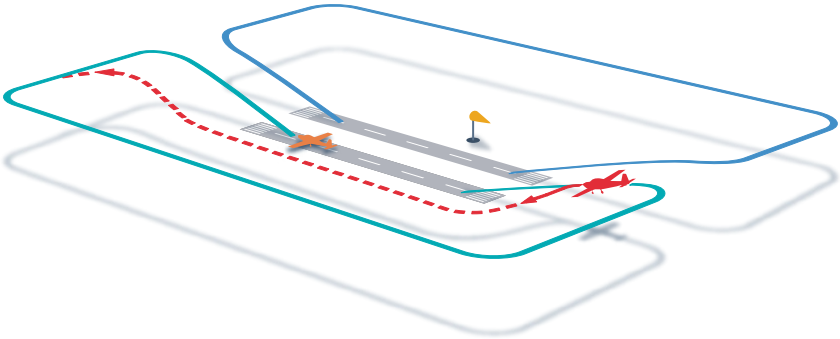
Note: ATC approval must be obtained if asymmetric training is to be carried out within 5 NM of a controlled aerodrome.

Go-around

At Class D aerodromes with parallel runways where contra-circuit operations are in progress, if ATC instructs, or you initiate a go-around, you must (AIP ENR 1.1):

- commence climbing to circuit altitude
- position the aircraft on the active side and parallel to the nominated duty runway, while maintaining separation from other aircraft
- follow ATC instructions or re-enter the circuit from upwind.

Figure: Go-around procedure for parallel runways



After landing

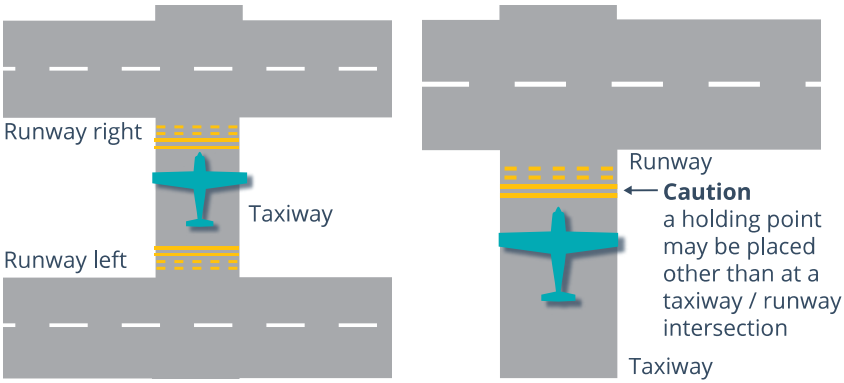
After landing, unless specified otherwise by ATC, you must comply with the following (AIP ENR 1.1):

- promptly vacate the runway without backtracking
- change from the aerodrome frequency to the SMC frequency (where established) when vacating the runway strip, and obtain an ATC taxi instruction
- not cross any runway that intersects the taxi route unless in receipt of a taxi instruction and a 'Cross runway (number)' instruction from ATC
- taxi to the destination via the most direct taxiway(s) available, and
- where an apron service is provided on a discrete frequency (see ERSA), change to that frequency on entering the apron.

A taxi instruction which contains a taxi limit beyond a runway must include a **'Cross runway (number)'** instruction to cross that runway. When an aircraft is required to hold short of a runway intersecting the taxi route, ATC will issue a taxi instruction limit of the holding point associated with the intersecting runway.

An aircraft which has been issued with a taxi instruction limit of the holding point of a runway intersecting the taxi route, or which has been issued with an instruction to **'Hold short'** of that runway, must subsequently be issued with an instruction to **'Cross runway (number)'**.

Figure: Taxiing aircraft holding short



Aircraft required to hold short of a runway must hold at the appropriate holding point for that runway, or the runway strip edge at the intersection of a crossing runway.

When separate frequencies for aerodrome control and surface movement control are in use, on landing, you must change from the aerodrome control frequency to the ground frequency on vacating the runway strip, and then transmit the aircraft callsign and, if applicable, parking bay number. You may **'Request detailed taxi instructions to (location)'**.

Radio watch must be maintained on the SMC or tower frequency (where no SMC frequency is provided) until parked.

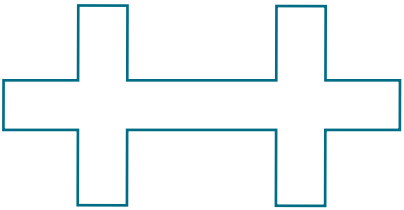
Sport and recreational aviation

Gliding operations (AIP ENR 5.5)

For rules relating to gliding operations refer to CASR Part 103 and the Part 103 MOS.

You should take extra care when operating at an aerodrome where gliding operations are in progress. Gliding operations are indicated by the gliding operations in progress ground signal displayed next to the primary wind direction indicator. You should also establish whether the gliders are being launched by wire or aero-tow, or both.

Figure: Gliding operations in progress ground signal



Where aero-towing is in progress, you should remain well clear of gliders under tow. If wire launching is used, you should establish the locations of either the winch or tow car and the cable and remain well clear. Overflying the active runway below 2,000 ft AGL is not advised, nor is landing without first ascertaining that the cable is on the ground and not across the landing path. Aero tow and winch launching are possible up to 4,000 ft AGL but launches to 1,500 ft or 2,000 ft AGL are normal.

In class G airspace gliding operations may be conducted without a radio, on Area very high frequency (VHF) or on frequencies 122.5 MHz, 122.7 MHz or 122.9 MHz, which have been allocated for use by gliders. Radio equipped gliders at non-controlled aerodromes make broadcast when in the vicinity of the aerodrome.

Gliding operations at certified aerodromes

Gliding operations at certified aerodromes may be carried out on:

- a glider runway strip within the runway strip (single runway), using a common circuit direction
- a glider runway strip adjacent to the existing runway strip (dual runways), using a common circuit direction
- a separate glider runway strip parallel to and spaced away from the existing runway strip (parallel runways), using contra-circuit procedures.

Details of the gliding operation are published in the ERSA entry for the aerodrome. When procedures are changed for intensive short-term gliding activity, a NOTAM will be issued.

Where dual or parallel runways are established, the glider runway strip will conform to normal movement area standards but will be marked by conspicuous markers of a colour other than white. Glider runway strips must not be used except by gliders, tug aircraft and other authorised aircraft.

Where a single runway is established and gliders operate within the runway strip, the runway strip markers may be moved outwards to incorporate the glider runway strip. Glider movement and parking areas are established outside the runway strips. When the glider runway strip is occupied by a tug aircraft or glider, the runway is deemed to be occupied. Aircraft using the runway may, however, commence their take-off run from a position ahead of a stationary glider or tug aircraft.

Except for gliders approaching to land, powered aircraft have priority in the use of runways, taxiways and aprons where a single runway or dual runway operation is established.

At the locations where parallel runways exist and contra-circuit procedures apply, operations on the two parallel runways by aircraft below 5,700 kg MTOW may be conducted independently in VMC by day. Aircraft must not operate within the opposing circuit area below 1,500 ft AGL. You should ascertain the runway direction in use as early as possible and conform to that circuit. A crossing runway should only be used when operationally necessary, and traffic using the crossing runway should avoid conflicting with the established circuit, for example, by using a long final, or not turning after take-off until well clear.

At aerodromes without prescribed contra-circuits, gliders must generally conform to the established circuit direction. However, unforeseen circumstances may occasionally compel a glider to execute a non- standard pattern, including use of the opposite circuit direction in extreme cases.

At non-controlled aerodromes a listening watch on the appropriate frequency is maintained during aero-tow launching by the tug pilot, and during wire launching by the winch or tow-vehicle driver. The tug pilot or winch/car driver may be able to advise glider traffic information to inbound or taxiing aircraft.

Where wire launching is used launching will cease, and the wire will be retracted or moved off the strip when another aircraft joins the circuit or taxis, or a radio call is received indicating this. A white strobe light is displayed by a winch, or a yellow rotating beacon by a tow-car or associated vehicle, whenever the cable is deployed.

Parachuting operations

For rules relating to parachuting operations refer to CASR Part 105.

Conflicting traffic

ATC will provide separation between parachuting and non-parachuting aircraft in Class A, C and D airspace, and provide traffic information to pilots of aircraft engaged in parachuting operations on known or observed traffic in Class E and Class G airspace.

Additional requirements in controlled airspace

ATC will base separation on the assumption that the parachutists will be dropped within one nautical mile of the target. If an extension of this area is necessary, the pilot must advise ATC of the direction and distance required.

Additional requirements for operations above 10,000 ft AMSL

Pilots should refer to sections 26.43 to 26.47 of the Part 91 MOS for the requirements relating to oxygen.

Ballooning

Types of operation

Manned hot air balloons (Part 131 aircraft) are permitted to operate in sport and recreational activities, commercial balloon flying training activities, balloon transport operations and specialised balloon operations. Balloon transport operations that carry paying passengers and commercial balloon flying training activities are conducted under an air operator's certificate (AOC). A specialised balloon operation may be commercial or non-commercial and must be operated under a CASR 131.035 approval. Sport and recreational activity and private pilot authorisations are administered by CASA.

The rules that apply to Part 131 aircraft are set out in CASR Part 91 and Part 131 regulations and the MOS. Not all the Part 91 regulations are applicable to Part 131 aircraft, some because they are not relevant and some because Part 131 contains an equivalent rule.

Hot air balloons are by far the most common type of Part 131 aircraft flown in Australia, but hot air airships have occasionally made an appearance in Australian skies.

See **Guide for balloons and hot air airships** for further information.

Operations in controlled airspace and in the vicinity of non-controlled aerodromes

A balloon pilot who holds a Commercial Pilot (Balloon) Licence (CP(B)L), a Civil Aviation Regulations 1988 (CAR) Part 5 certificate of validation, or a suitably endorsed PPC may operate:

› in controlled airspace subject to ATC clearance

› below 2,000 ft AGL within 3 NM of a non-controlled aerodrome.

The pilot of a balloon which is taking off within 3 NM of a non-controlled aerodrome must give way to aircraft which are landing or on final approach to land, by delaying their take-off or, if airborne, by climbing or descending to remain clear of the other aircraft's flight path.

Despite the general aircraft give-way rules, the pilot of a balloon must also give way to other traffic operating in the traffic pattern of the aerodrome when operating within 3 NM of the aerodrome.

Carriage and use of radio

Pilots of balloons who have been permitted to operate in controlled airspace and below 2,000 ft AGL within 3 NM of a non-controlled aerodrome must carry and use VHF radio for communication, as necessary, with other aircraft and with ATS.

Where several balloons are permitted to operate together in the vicinity of a non-controlled aerodrome at which the carriage and use of radio is mandatory, one balloon in each group may maintain radio communication for the group.

All pilots of balloons must carry radio and use it in accordance with the procedures described in the AIP and the Part 131 MOS while they are operating:

› within the vicinity of a non-controlled aerodrome where carriage of a radio and its use are required

› at or above 5,000 ft above mean sea level

› within 10 NM of an aerodrome with a published instrument approach procedure, or

› at night.

Minimum height rules

Balloons may take-off from, and land at, adequate open spaces within populous areas. The minimum overflight height for a balloon over a populous area is 1,000 ft AGL unless taking off or manoeuvring for a landing.

Outside of a populous area balloon pilots do not need to maintain a minimum height AGL. However, this does not absolve pilots from any responsibility not to cause a hazard to landholders, stock, persons or property. Local balloon operators may maintain a register of sensitive areas where landholders have requested that pilots either do not land, or alternatively, observe a minimum overfly height.

Meteorological conditions for balloons

Part 131 aircraft must operate under VFR and the VMC criteria.

Civil Aviation Safety Authority

Night VFR

Checklist

To fly in command

1 In the last 6 months:
Completed one take-off and landing?
No ▶ **Do one take-off and landing dual**
CASR 61.965
Yes ▼

2 In the last 24 months:
Completed a flight review, test or proficiency check for a Night Visual Flight Rules (NVFR) rating or endorsement?
No ▶ **This must be completed**
CASR 61.970
Yes ▼

3 In the last 90 days, to carry passsengers:
(a) Completed three take-offs and landings dual or solo; or
(b) Completed a flight test or a relevant check, review for a NVFR rating, endorsement, or a flight including night operations as appropriate?
No ▶ **Complete (a) or (b)**
CASR 61.395
Yes ▼

LSALT

4 Published LSALT?
No ▶ **Calculate LSALT by:**
(a) 10 NM either side of track
(b) Inaccurate navigation or NAVAID failure ±5 NM radius plus ±20% air distance travelled from last fix
(c) From AID ±10.3° to a max of 50 NM either side of track plus ±5 NM
(d) Dead Reckoning (DR): ±15° to a max of 50 NM either side of track plus ±5 NM
AIP GEN 3.3
Yes ▼

Weather and NOTAMs

5 Pilot briefing from NAIPS obtained?
No ▶ **Obtain**
Yes ▼

6 GAR indicates:
Cloud > SCT below LSALT plus 1,000 ft?
Yes ▶ **Don't fly**
Due to inability to maintain VMC
No ▼

Note: methods of determining cloud amounts (AIP ENR 1.1)

Go to **7**

7 TAF indicating the presence, PROB30 or PROB40 of:

(a) Cloud > SCT below 1,500 ft
(b) Visibility < 8 km
(c) Crosswind > max for aircraft?

Yes ▶ **Plan for alternate**

AIP ENR 1.1

No ▼

8 NAVAID:

Aerodrome served by NAVAID + aircraft equipped with NAVAID?

No ▶ **Plan for alternate**

Within 1 hr that has NAVAID

Yes ▼

9 Lighting:

(a) Pilot Activated Lighting (PAL) system + standby power supply + responsible person
(b) Portable with responsible person?

No ▶ **Plan for alternate**

Alternates with PAL do not need a responsible person if dual VHF equipped or 1 x VHF + HF + 30 min holding

Yes ▼

Aircraft equipment

10 Aircraft instruments:

(a) Airspeed indicator
(b) Altimeter
(c) Compass
(d) Clock
(e) AI
(f) DG
(g) Turn and slip
(h) Suction gauge
(i) VSI

No ▶ **Don't fly**

Yes ▼

11 Aircraft lighting:

(a) Instrument lights with variable illumination
(b) One landing light for private, two landing lights for commercial

No ▶ **Don't fly**

Yes ▼

12 Aircraft radio equipment:

(a) 1 x VHF radio
(b) 1 x NAVAID (NDB, VOR or certified GNSS)
(c) SSR transponder if operating in CTA/RADAR?

No ▶ **Don't fly**

Yes ▼

13 SARTIME or Flight note:

Submitted 30 mins before EOBT if travelling:
(a) Further than 120 NM
(b) Through a designated remote area or
(c) Over water

No ▶ **Submit one**

Yes ▶ **Enjoy your flight**

General flight operations

VFR flights at night (CASR 91.277) (MOS12.03)

You must not fly VFR at night along a route or route segment below:

- any published LSALT for the route or route segment
- any minimum sector altitude published in the AIP
- the LSALT for the route
- the lowest altitude for the route calculated in accordance with the method prescribed in MOS 12.03 (currently RESERVED)
- 1,000 ft above the highest obstacle on the ground or water within 10 NM ahead of, and to either side of, the aircraft at that point on the route or route segment.

Exception: *You are permitted to fly below the minimum height when:*

- *taking off or landing*
- *within 3 NM of the aerodrome when taking off or landing*
- *flying in accordance with an air traffic control clearance.*

Specific requirements are prescribed for operations under Part 121 (121.780); Part 131 (131.315); Part 133 (133.167; Part 135 (135.235) and Part 138 (138.275).

Training operations at night – aeroplane and rotorcraft

Refer to Chapter 1 – Training flight limitations regarding in-flight:

- engine shutdown
- simulated engine failure
- simulated failure of flight instruments
- simulated IMC.

For multi-engine aircraft, simulating engine failures in IMC or at night, the circling area is either:

- a prescribed IFR circling area for the aerodrome associated with an authorised instrument approach procedure, or
- if there is no prescribed IFR circling area of this kind for the aerodrome, an area within 3 NM of the aerodrome reference point, but only for an aeroplane with MTOW less than or equal to 5,700 kg.

Note: The information provided by spot heights on instrument approach and landing (IAL) charts must be treated with caution, as they do not necessarily indicate the highest terrain or all obstacles in the circling area. Pilots of flights involving simulated engine failures should risk-assess their intended flight path options against the aircraft performance capability in this situation.

Rating and endorsements

Authorisation of a night VFR rating (CASR 61.955 and 61.375)

The holder of a pilot licence and a night VFR rating is authorised to pilot an aircraft at night under the VFR, except if the operation is one of the following, for which an additional rating is required (see CASR Subpart 61.P and Subpart 61.Q):

- an operation using a night vision imaging system, or
- a night aerial application operation below 500 ft AGL.

The grant of a night VFR rating (CASR 61.975)

An applicant for a night VFR rating must:

- hold a private pilot licence, commercial pilot licence or air transport pilot licence
- meet the requirements for the grant of at least one endorsement listed in the table below
- have at least 10 hours of aeronautical experience at night in an aircraft or an approved flight simulation training device for the purpose, including at least five hours of dual cross-country flight time at night under VFR in an aircraft
- have passed the flight test mentioned in CASR 61 MOS for the night VFR rating.

The grant of a night VFR endorsement (CASR 61.990)

An applicant for an endorsement shown in the following table must hold a night VFR rating and have:

- completed flight training for the endorsement
- met the aeronautical experience requirements in the following table
- passed the flight test mentioned in Part 61 MOS for the endorsement.

Table: Night VFR endorsements

	Endorsement	Activities authorised	Requirements
1	Single-engine aeroplane night VFR endorsement	Pilot an aeroplane of the single-engine aeroplane class at night under the VFR	At least five hours of aeronautical experience at night as pilot of an aeroplane (or an approved flight simulation training device for the purpose), including at least one hour of dual flight and one hour of solo night circuits At least three hours of dual instrument time
2	Multi-engine aeroplane night VFR endorsement	Pilot an aeroplane at night under the VFR	At least five hours of aeronautical experience at night as pilot of a multi-engine aeroplane (or an approved flight simulation training device for the purpose), including at least one hour of dual flight and one hour of solo night circuits At least three hours of dual instrument time
3	Helicopter night VFR endorsement	Pilot a helicopter at night under the VFR	At least 10 hours of aeronautical experience at night as pilot of a helicopter (or an approved flight simulation training device for the purpose), including at least three hours of dual flight and one hour of solo night circuits At least three hours of dual instrument time in a helicopter (or approved flight simulation training device for the purpose)
4	Powered lift aircraft night VFR endorsement	Pilot a powered lift aircraft at night under the VFR	At least five hours of aeronautical experience at night as pilot of a helicopter or powered lift aircraft (or an approved flight simulation training device for the purpose), including at least three hours of dual flight and one hour of solo night circuits At least three hours of dual instrument time

	Endorsement	Activities authorised	Requirements
5	Gyroplane night VFR endorsement	Pilot a gyroplane at night under the VFR	At least five hours of aeronautical experience at night as pilot of a helicopter (or gyroplane or an approved flight simulation training device for the purpose), including at least three hours of dual flight and one hour of solo night circuits At least three hours of dual instrument time
6	Airship night VFR endorsement	Pilot an airship at night under the VFR	At least five hours of aeronautical experience at night as pilot of an airship (or an approved flight simulation training device for the purpose), including at least three hours of dual flight and one hour of solo night circuits

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Recent experience requirement

For night VFR flight (CASR 61.965)

The holder of a night VFR rating is authorised to exercise the privileges of the rating in an aircraft of a particular category only if the holder has, within the previous six months:

- carried out the following in an aircraft of that category while controlling the aircraft:
  - at least one night take-off, and
  - at least one night landing, or
- been assessed as competent to fly at night in an aircraft of that category by a flight instructor who holds a night VFR training endorsement.

To carry passengers at night (CASR 61.395)

The holder of a pilot licence is authorised to pilot, during take-off or landing, an aircraft of a particular category carrying a passenger at night only if the holder has, within the previous 90 days, in an aircraft of that category (or an approved flight simulator for the purpose), carried out, at night, while controlling the aircraft or flight simulator:

- at least three take-offs, and
- at least three landings.

However, the holder is taken to meet the requirement above if:

- within the previous 90 days, in an aircraft of that category or an approved flight simulator for the purpose, the holder has achieved the following where at least one take-off, and at least one landing at night was included:
  - successfully completed a relevant check or review, or
  - passed a flight test for a pilot licence or a rating on a pilot licence.

Note: A 'relevant check or review' includes either:

- an instrument proficiency check; a night vision imaging system proficiency check; an instructor proficiency check; an operator proficiency check or
- a flight review.

Flight review (CASR 61.970)

The flight review requirements in the paragraph below are applicable to either one of the following categories of aircraft, as appropriate:

- aeroplane
- helicopter
- powered-lift aircraft
- gyroplane, or
- airship.

The holder of a night VFR rating is authorised to pilot an aircraft other than a multi-engine aeroplane at night under VFR only if, within the previous 24 months, the holder:

- has successfully completed a flight review for the rating in an aircraft of the same category (or an approved flight simulator) for the flight review
- has passed a flight test for the rating in an aircraft of the same category (or an approved flight simulator) for the flight test
- has passed a flight test for the grant of a night VFR endorsement in an aircraft of the same category (or an approved flight simulator) for the flight test, but more than six months after passing the flight test for the rating
- has successfully completed an operator proficiency check that covers night VFR operations in an aircraft of the same category, or
- has successfully participated in an operator's approved cyclic training and proficiency program that covers night VFR operations in an aircraft of the same category.

The holder of a night VFR rating is authorised to pilot an aircraft that is a multi-engine aeroplane only if the relevant events mentioned in the paragraph above are completed, passed, or participated in, using a multi-engine aeroplane.

Aircraft equipment for night VFR

Radio communication systems (CASR 91.400 & 91.635 MOS 21.07)

Class	Night VFR
Airspace	Classes A, C, D, E, G
Communication requirements	VHF
Remarks	VHF communications systems must be capable of communication on all VHF frequencies required by 91.400, 91.635 and 91 MOS 21.04 21.07 and 26.18. **Note:** these requirements can also be found in AIP ENR 1.1

Radio navigation systems (CASR 91MOS 26.07 & 26.11)

Type of operation	Night VFR
System number	1
System type	Automatic direction finder (ADF), VOR or GNSS
Conditions	In this table GNSS refers to equipment certified to (E) technical standing order (TSO)- C129 (E) TSO- C145, (E) TSO- C146, (E) TSO- C196a, as determined by CASA.

Equipment listed in this section is for a Part 91 flight. Pilots operating under CASR Part 135 Air transport or CASR Part 138 Aerial work should consult the applicable MOS, and the company exposition or operations manual for additional requirements that may apply.

Cockpit and cabin lighting requirement (CASR 91 MOS 26.21)

Night

An aircraft flying at night must be fitted with, or carry:

- a cockpit lighting system that:
  - illuminates each item of equipment including checklists and flight documents a flight crew member (FCM) may use
  - is compatible with each item of equipment a pilot may use
  - is arranged in a way that each pilot from their normal sitting position can read all placards and instrument markings and their eyes are shielded from direct and reflected light
  - is adjustable, so that the intensity of the lighting for the light conditions can be varied
- a cabin lighting system that enables each occupant of the aircraft to see and use:
  - their seatbelt and oxygen facilities (if any)
  - the normal and emergency exit
- for each FCM, an independent portable light accessible to the FCM from their normal sitting position
- for each other crew member (if any), an independent portable light accessible to the crew member at their crew station.

Day

Cockpit lighting and cabin lighting is also required if, by day, natural light does not adequately illuminate the items of equipment and documents mentioned above.

An independent portable light is most commonly a flashlight or torch which is serviceable and can produce sufficient light to properly illuminate any switch control or display that the pilot may be required to use or view in normal abnormal and emergency situations.

Landing lights (CASR 91 MOS 26.23)

An aircraft operating by night must be fitted with at least 1 landing light.

Note: for operations under other CASR Parts there may be further requirements.

See Chapter 1 for requirements for anti-collision lights.

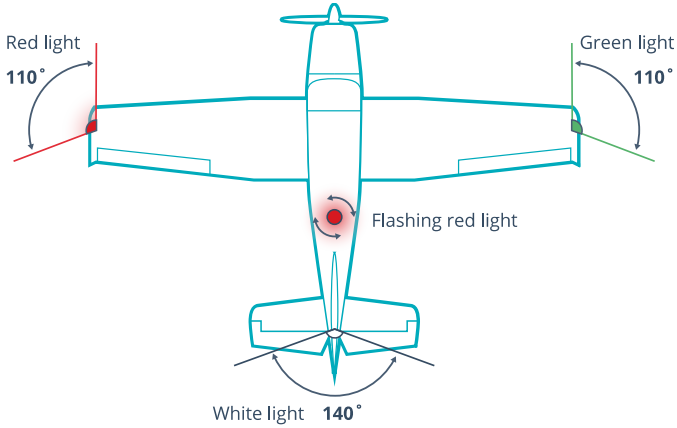
Navigation lights (CASR 91 MOS 26.24)

An aircraft operating by night or in poor visibility must be fitted with navigation lights.

Navigation lights, where required to be fitted, must be displayed on the aerodrome movement area.

Exception: *Navigation lights do not need to be displayed if permitted by another MOS provision such as section 12.09 of the Part 138 MOS: Display of exterior lighting in an NVIS operation that is an aerial work operation. See also section 3.08 of the Part 91 MOS.*

Figure: Aircraft navigation lights



Aeroplane instruments (CASR 91 MOS 26.07)

An aeroplane for VFR flight at night must be fitted with:

› an approved GNSS, or

› automatic direction finding (ADF) equipment or VOR.

If an approved GNSS has automatic barometric aiding options as specified in the standards below, they must be connected:

- (E)TSO-C129a
- (E)TSO-C145a
- (E)TSO-C146a
- (E)TSO-C196a.

An aeroplane flying under night VFR must have equipment for measuring and displaying the flight information, as shown in the following Table.

For light sport aircraft see CASR 91 MOS 26.13; for experimental aircraft see MOS 26.14; for certain registered aircraft see MOS 26.16.

Table: Requirements for equipment – aeroplane VFR flight by night

Flight information	Requirements
Indicated airspeed	The equipment must be capable of being connected to: › an alternate source of static pressure that: » a pilot can select » includes a selector that can open or block the aeroplane's static source and alternative static source simultaneously, or › a balanced pair of flush static ports.
Mach number	Only for an aeroplane with operating limitations expressed as a Mach number
Pressure altitude	The equipment must: › have an adjustable datum scale calibrated in millibars or hPa, and › be calibrated in ft except » if a flight is conducted in a foreign country which measures FLs or altitudes in metres, it must be calibrated in metres or fitted with a conversion placard or device › be capable of being connected to an alternate source of static pressure that a pilot can select, or » a balanced pair of flush static ports.

Flight information	Requirements
Magnetic heading	› a direct reading magnetic compass, or › both a remote indicating compass and a standby direct reading magnetic compass
Time	The equipment must display accurate time in hours, minutes and seconds, and be either: › fitted to the aircraft, or › worn by, or immediately accessible to, the pilot for the duration of the flight.
Turn and slip	The equipment must display turn-and-slip information, except when a second independent source of attitude information is available, in which case only the display of slip information is required.
Attitude	No additional requirements
Vertical speed	The equipment must be capable of being connected to: › an alternate source of static pressure that a pilot can select, or › a balanced pair of flush static ports.
Stabilised heading	The equipment must indicate whether the power supply to the gyroscopic instruments is working satisfactorily. **Note:** A gyro-magnetic type of remote indicating compass meets this requirement if it has a primary and an alternate power supply.
Outside air temperature	No additional requirements

Note: For gyroscopic instruments (if any), equipment that indicates whether the power supply is adequate must be fitted.

Equipment listed in this section is for a Part 91 flight. Pilots operating under CASR Part 135 Air transport or CASR Part 138 Aerial work should consult the applicable MOS, and the company exposition or operations manual for additional requirements that may apply.

Emergency equipment (CASR 91 MOS 26.03)

Emergency equipment that is required, to be fitted to, or carried on, an aircraft must be easily accessible for immediate use in the event of an emergency. (MOS 26.03).

Lowest safe altitude

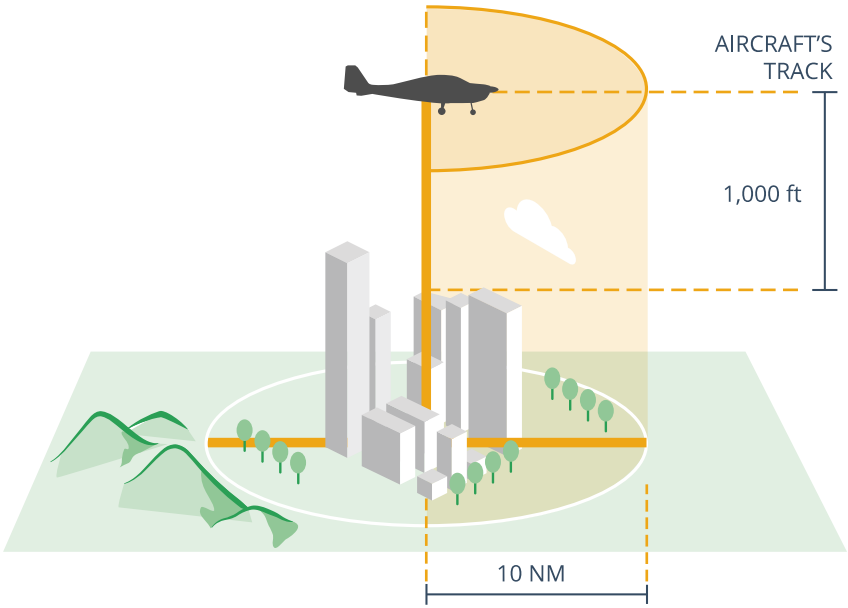
Operational requirements (CASR 91.277) (MOS 12.03)

You must not fly VFR at night along a route or route segment below one of the following:

- any published LSALT for the route or route segment
- any minimum sector altitude published in the AIP
- any calculated LSALT for the route or the route segment prescribed in the MOS (Note: MOS 12.03 is RESERVED)
- 1,000 ft above the highest obstacle on the ground or water within 10 NM ahead of, and to either side of, the aircraft at that point on the route or route segment

Exception: *You are permitted to fly below the minimum height when:*

- *taking off or landing*
- *within 3 NM of the aerodrome when taking off or landing*
- *flying in accordance with an air traffic control clearance.*



Lowest safe altitude (LSALT) published on aeronautical charts (AIP GEN 3.3)

Grid LSALTs have been determined for en route charts (ERCs) and terminal area charts (TACs). On ERC-H (high), the grid for each LSALT is a square with the dimensions of four degrees of latitude by four degrees of longitude. On ERC-L (low) and TAC, the grid squares comprise one degree of latitude by one degree of longitude. The grid LSALT is normally displayed in the centre of the grid square.

If you use grid LSALT for obstacle clearance you are responsible for determining the allowance for navigation error that should be applied, considering the limitations of the navigation aids or method of navigation being used for position fixing. This navigation error allowance must be applied to the proposed track. The highest grid LSALT falling within the area covered by the determined navigation error must be used.

LSALT details for RNAV routes are shown in each grid square formed by the parallels and meridians.

On IFR charts, some LSALTs on one-way air routes have an associated direction arrow. This arrow indicates that the LSALT is only applicable in the direction of the one-way route, and an LSALT has not been calculated for the opposite direction.

An LSALT without a direction arrow on any air route indicates that the LSALT is the same in both directions. However, one-way routes should only be flown, in controlled airspace, in the direction indicated by the route designator box.

On ERCs, the LSALT figure is always attached adjacent to the distance 'bubble' of the route to which the LSALT applies. In areas of chart clutter, these LSALT figures may sometimes cross adjacent route tracks.

LSALT not published on aeronautical charts (AIP GEN 3.3)

The LSALT specified for a route segment is that for IFR procedures. Where an NDB or VOR mark the segment, the tolerances applicable to the NDB are used. Unreported obstacles up to 360 ft may exist in navigation tolerance areas. Unpublished LSALTs must be calculated using the following method:

- where the highest obstacle is more than 360 ft above the height determined for terrain, the LSALT must be 1,000 ft above the highest obstacle or
- where the highest obstacle is less than 360 ft above the terrain, or there is no charted obstacle, the LSALT must be 1,360 ft above the elevation determined for terrain, except
- where the elevation of the highest terrain or obstacle in the tolerance area is not above 500 ft, the LSALT must not be less than 1,500 ft.

If the navigation of the aircraft is inaccurate, or the aircraft is deliberately flown off track, or whenever there is failure of any radio navigation aid normally available, the pilot in command must ensure that the aircraft is flown not lower than 1,000 ft above the highest terrain or obstacle within a circle, centred on the DR position, with a radius of 5 NM plus 20% of the air distance flown from the last positive fix.

For routes defined by radio navigation aids or to be navigated by DR:

- the area to be considered must be within an area of 5 NM surrounding and including an area defined by lines drawn from the departure point or en route radio aid, 10.3 degrees each side of the nominated track (where the track `guidance is provided by a radio navigation aid), or
- 15 degrees each side of the nominal track (where no track guidance is provided) to a limit of 50 NM each side of the track, and thence paralleling track to abeam the destination and then converging by a semicircle of 50 NM radius centred on the destination.

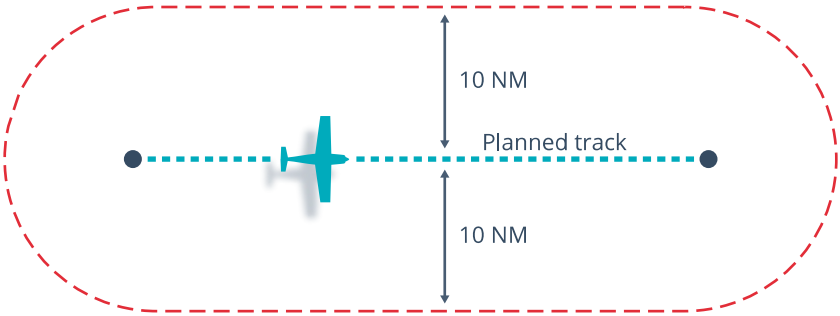
On shorter routes, where these lines are displaced by less than 50 NM abeam the destination, they shall converge by a radius based on the lesser distance. Where the lines thus drawn at any time come within the coverage of an en route or destination radio aid the aircraft is equipped to use, they will converge by straight lines to that aid. The minimum angle of convergence which must be used in this case is 10.3 degrees each side of track (AIP GEN 3.3).

Rated coverage (AIP GEN 1.5)

The following ranges are quoted for planning purposes. Actual ranges obtained may sometimes be less than these due to facility and site variations (see ERSA FAC for individual stations). The localiser ranges are for those installations that have been nominated for position fixing at ranges beyond 25 NM.

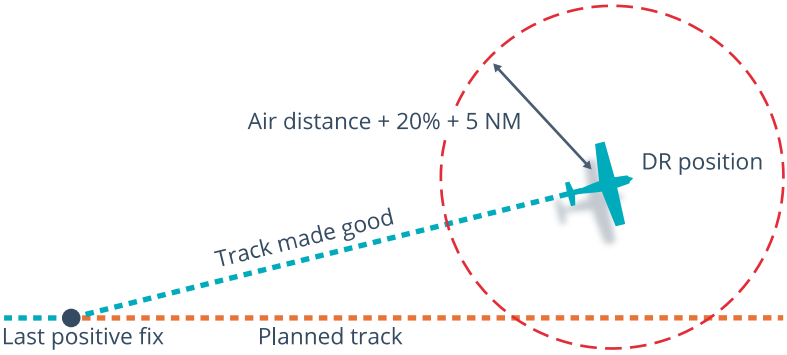
Aircraft altitude	Range
Using a NDB (published in ERSA FAC) or VOR and DME	
Below 5,000 ft	60 NM
5,000 ft to below 10,000 ft	90 NM
10,000 ft to below 15,000 ft	120 NM
15,000 ft to below 20,000 ft	150 NM
20,000 ft and above	180 NM
Using a localiser	
At 2,000 ft AGL within ±10° of course line	25 NM
Below 5,000 ft	30 NM
5,000 ft and above	50 NM

Area to be considered for LSALT calculation

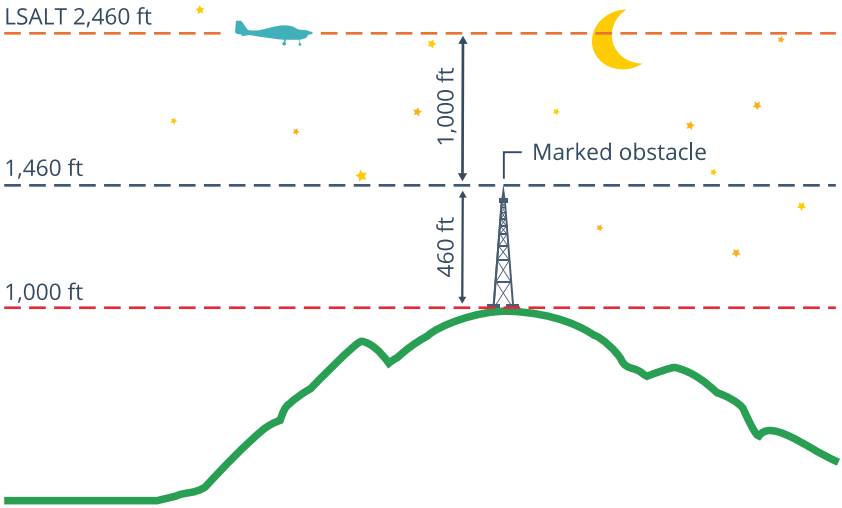


Note: refer to AIP Gen 3.3-7 for routes being operated to required navigation performance (RNP) 2 or other area navigation specifications.

Area to be considered for off-track LSALT calculation

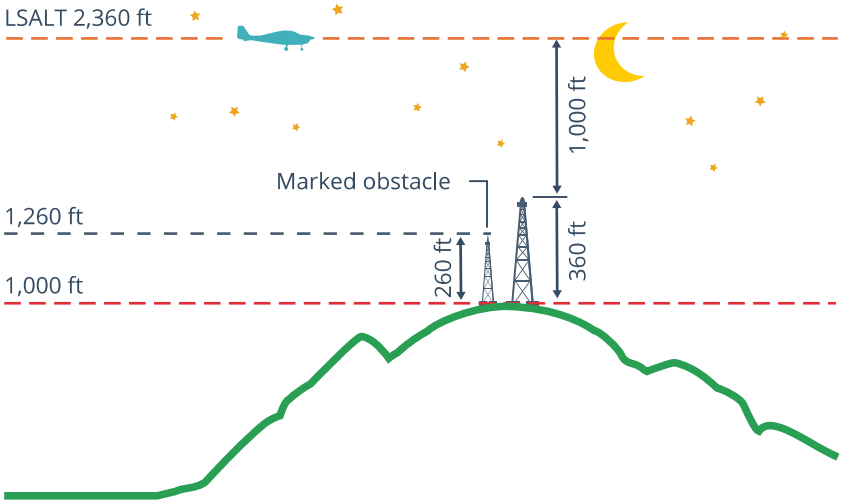


How to calculate LSALT at night



460 ft + 1,000 ft = 1460 ft + 1,000 ft = LSALT 2,460 ft

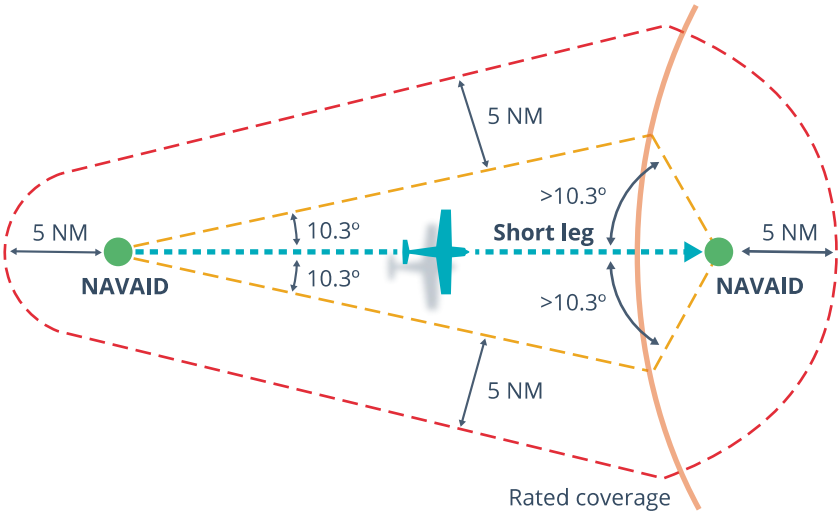
How to calculate LSALT at night – with additional unmarked obstacle



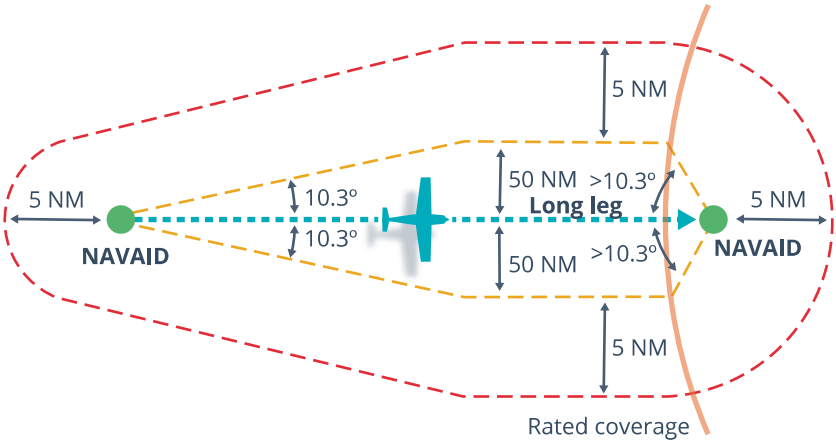
Assuming an obstacle is 360 ft beside marked obstacle

360 ft + 1,000 ft = 1,360 ft + 1,000 ft = LSALT 2,360 ft

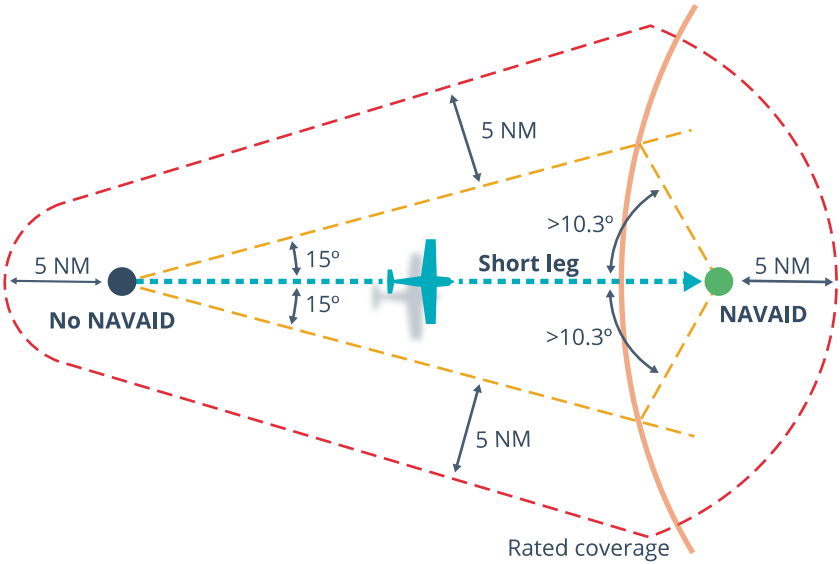
How to calculate LSALT with short leg between NAVAID and NAVAID



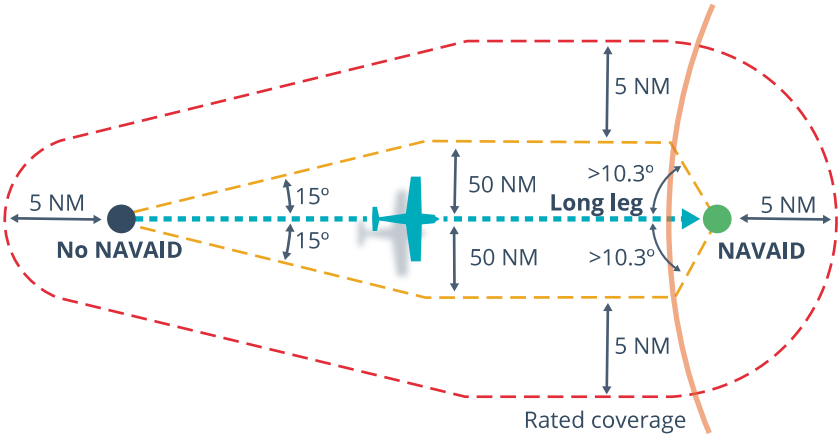
How to calculate LSALT with long leg between NAVAID and NAVAID



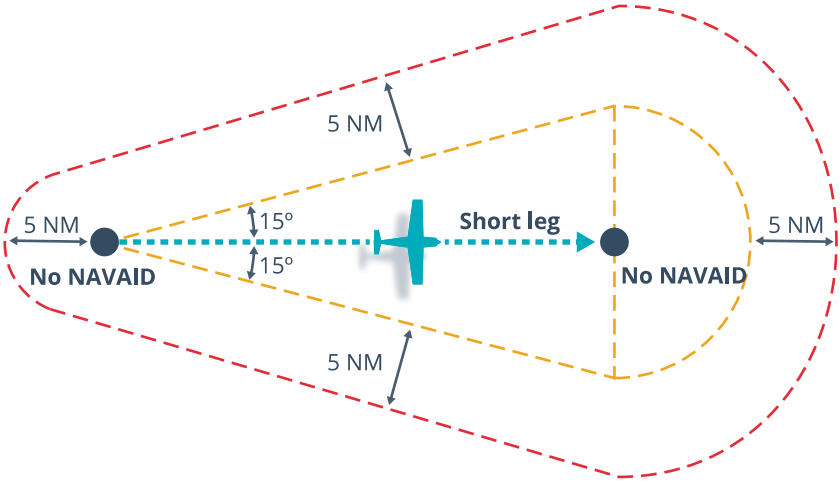
How to calculate LSALT with short leg between No NAVAID and NAVAID



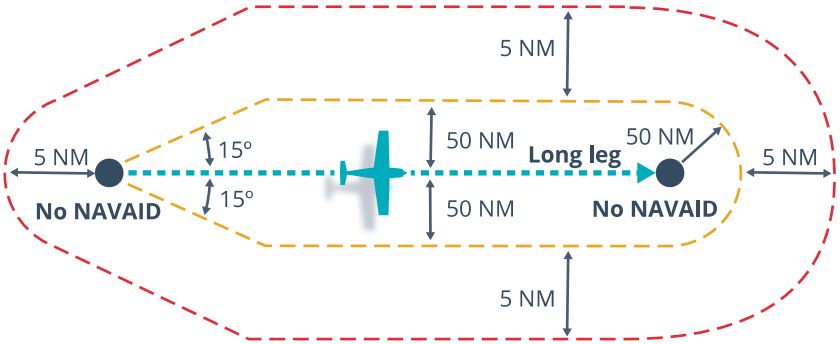
How to calculate LSALT with long leg between No NAVAID and NAVAID



How to calculate LSALT with short leg between No NAVAID and No NAVAID



How to calculate LSALT with long leg between No NAVAID and No NAVAID



Alternate aerodromes

General (CASR 91 MOS 8.07)

You must make provision for flight to an alternate aerodrome in accordance with the following paragraphs.

When a flight is required to provide for an alternate aerodrome, any aerodrome may be so nominated for that flight provided that:

- it is suitable as a destination for that flight
- it is not an aerodrome for which an alternate would also be required
- it is not a helideck.

Weather (CASR 91 MOS 8.04)

You must provide for a suitable alternate aerodrome when arrival at the destination will be during the currency of, or up to, 30 minutes before the forecast commencement of meteorological conditions falling below VFR alternate minima:

- For aeroplanes by day or night, or for helicopters by night only:
  - cloud base ceiling of 1,500 ft AGL
  - visibility of 8 km.

When an aerodrome forecast is not available, then you must make provision for a suitable alternate that has an available forecast.

Radio navigation aids (CASR 91 MOS 8.05)

For a VFR flight by night, you must nominate a destination alternate aerodrome that is within one hour's flight time of the planned destination aerodrome unless:

- the destination is served by a ground-based radio navigation aid and the appropriate radio navigation system is fitted to the aircraft and you are competent to use the aid, or
- the aircraft is fitted with an approved GNSS, and you are competent to use the GNSS.

If aircraft navigation is to be conducted using a GNSS certified only to TSO C-129, navigation to a destination alternate aerodrome must be planned to use a navigation system other than GNSS.

Destination alternate aerodromes – aerodrome lighting (CASR 91 MOS 8.06)

For this section, a qualified and responsible person means a person who is instructed in, and is competent to display, the standard runway lighting with portable lights.

If a flight is planned to land at night at an aerodrome that only has portable runway lighting, you must nominate a destination alternate aerodrome unless:

- reliable arrangements have been made for a qualified and responsible person to:
  - attend the aerodrome during the period from at least 30 minutes before the ETA to completion of landing and taxiing, and
  - display the portable lighting.

If a flight is planned to land at night at an aerodrome with electric runway lighting, but without standby power, you must nominate a destination alternate aerodrome unless:

- portable runway lights are available, and
- reliable arrangements have been made for a qualified and responsible person to:
  - attend the aerodrome during the period from at least 30 minutes before the ETA to completion of landing and taxiing, and
  - display the portable lighting.

Runway lighting (CASR 91 MOS 8.06)

Portable lighting

When a flight is planned to land at night at an aerodrome where the runway lighting is portable, an alternate is required unless arrangements are made for a qualified and responsible person to be in attendance during the arrival and departure times as specified in aerodrome lighting – times of activation, to ensure that the runway lights are switched on.

Standby power

When a flight is planned to land at night at an aerodrome with electric runway lighting, whether pilot activated or otherwise, but without standby power, an alternate is required unless portable runway lights are available and arrangements have been made for a qualified and responsible person to be in attendance during the arrival and departure times specified in aerodrome lighting – times of activation, to display the portable lights in the event of a failure of the primary lighting.

This alternate need not have standby power or standby portable runway lighting.

Pilot activated lighting (PAL)

When a flight is planned to land at night at an aerodrome with PAL and standby power, an alternate is required unless a qualified and responsible person is in attendance to switch on the aerodrome lighting manually.

This alternate need not have standby power or standby portable runway lighting. However, the alternate must meet the following conditions.

Requirements for alternate aerodrome when using PAL

An aerodrome may be nominated as an alternate provided that, if the aircraft is fitted with a single VHF communication, the alternate aerodrome must be one which is:

- served by a lighting system which is not pilot activated, or
- served by PAL, with a qualified and responsible person in attendance to manually switch on the aerodrome lighting.

Where the alternate aerodrome is served by PAL, there is no need for a responsible person on the ground to be in attendance, but the aircraft must be equipped with:

- HF radio and carry 30 minutes holding fuel to allow for the alerting of ground staff in the event of a failure of the aircraft's VHF communication.

Aerodrome lighting – times of activation (CASR 91 MOS 8.06)

If a flight is planned to land at night at an aerodrome that only has portable runway lighting, you must nominate a destination alternate aerodrome unless:

- reliable arrangements have been made for a qualified and responsible person to:
  - attend the aerodrome during the period from at least 30 minutes before the ETA, to completion of landing and taxiing, and
  - display the portable lighting.

Qualified and responsible person (CASR 91 MOS 8.06)

A responsible person referred to above in relation to portable lights, means a person who is instructed in, and is competent to display, runway lighting with portable lights.

Lighting alternate not required (first light provision)
(CASR 91 MOS 8.06)

The alternate requirements above need not be applied if the aircraft carries holding fuel for first light plus 10 minutes at the destination.

Controlled aerodrome lighting (AIP ENR 1.1)

Aerodrome lighting at an aerodrome where a control tower is operating will be activated by ATC as necessary. If you require aerodrome lighting outside the control tower's published hours you should use PAL, if available, or make appropriate arrangements with ATC. If ATC has already ceased duty, requests should be directed to the local aerodrome operator. Confirmation should be obtained that requests for lighting will be satisfied.

If you have made arrangements with ATC for night lighting you must notify any change in requirements.

Non-controlled aerodrome lighting (AIP ENR 1.1)

Aerodrome lighting at non-controlled aerodromes should be arranged directly with the aerodrome operator, or by using PAL facilities, if available.

ERSA identifies locations where selected runway lighting is routinely left switched on during the hours of darkness.

A comprehensive advisory circular (AC 61-05) on Night VFR rating can be viewed at **casa.gov.au/download/night-vfr-rating**

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Air defence identification zone (ADIZ)

Air defence identification zone flights (CASR 91.263)

If you fly an aircraft in an air defence identification zone (ADIZ) you must comply with the procedures in the AIP for that zone.

Exception: *For a Part 131 aircraft, if you enter an ADIZ and you are unable to comply with the ADIZ procedures, no offence is committed if you land as soon as practicable and inform the controlling authority.*

Procedures for aircraft operating in an air defence identification zone (AIP ENR 1.12)

The following general rules and procedures apply to enable identification of air traffic entering any designated air defence identification zone under Australian control.

An ADIZ is airspace of defined dimensions within which identification of all aircraft is required. When you are intending to operate within an ADIZ, you must:

- lodge a flight notification covering flight within the ADIZ with the appropriate ATS unit at least 60 minutes before entry into the ADIZ
- report the position to ATS when passing each position reporting point within the ADIZ
- report the position to ATS at the ADIZ boundary with a geographical reference (for example: 15 NM east of (location)) or, if the departure point is within 100 NM of the ADIZ boundary, report departure
- report departure if departing from a point in the ADIZ
- maintain a continuous listening watch on the communications frequency of the appropriate ATS unit or on another frequency as directed until the flight is through the ADIZ
- not deliberately deviate from tracks and altitudes filed in the flight plan unless prior ATC clearance is obtained, or, outside controlled airspace, notification is given to the appropriate ATS unit
- activate the aircraft transponder when within 100 NM of the ADIZ and when operating within the ADIZ.

The following flights over Australia and its territorial waters are exempt from compliance with the requirements above:

- a flight originating within an ADIZ which maintains a steady outbound track
- a flight which remains within 10 NM of the point of departure
- aircraft performing published approach, holding or recovery procedures
- a flight conducted in accordance with special procedures arranged with the Regional Air Defence Commander.

Where flight plans have to be lodged, they must include details of:

- tracks and altitudes to be flown while operating in the ADIZ
- estimated elapsed times for each route segment in the ADIZ, including the segment in which the ADIZ boundary is crossed
- position reporting points, departure and landing points
- estimated time at the commencing point of the first route segment.

Reporting points published in aeronautical charts must be used in addition to those required by the Regional Air Defence Commander.

Pilots must immediately notify ATS of any deviation from flight plan beyond the following tolerances:

ATS notification for flight plan deviations	
Estimated time of commencing the ADIZ route segments	± 5 minutes
Over land area	±10 NM from track
Over oceanic areas	± 20 NM from track

Note: The five-minute limit will be used in considering an appropriate response, but you must report predicted deviations of greater than two minutes.

In the event of failure of two-way radio communication, you must proceed in accordance with the normal radio failure procedures.

Special requirements

Special requirements may be published relative to a particular ADIZ. Flights will not be exempted from the special requirements unless so specified.

Non-compliance

Significant deviations from the requirements for flight in an ADIZ must be reported immediately to ATS, and details and reasons for the deviation must be reported at the first point of landing, for transmission to the Regional Air Defence Commander.

Diversion of aircraft for defence operations

The regional Air Defence Commander may, through ATS, direct the flight of aircraft in the interests of national security. Messages initiating such requirements will be prefaced by **'military operations require…'**

Interception of civil aircraft

The following procedures and visual signals apply over the territory and the territorial waters of Australia in the event of interception of an aircraft.

Action by intercepted aircraft

An aircraft which is intercepted by another aircraft must immediately:

- follow the instructions given by the intercepting aircraft, interpreting and responding to visual signals in accordance with the visual signals below
- notify, if possible, the appropriate ATS unit
- attempt to establish radio communication with the intercepting aircraft, or with the appropriate intercept control unit, by making a general call on the emergency VHF frequency 121.5 MHz and repeating this call on the emergency UHF frequency 243.0 MHz, if practicable, giving the identity and position of the aircraft and nature of the flight
- if equipped with SSR transponder, select code 7700, unless otherwise instructed by the appropriate ATS unit
- if equipped with ADS-B or automatic dependent surveillance-contract (ADS-C), select the appropriate emergency functionality, if available, unless otherwise instructed by the appropriate ATS unit.

If any instructions by radio from any sources conflict with those given by the intercepting aircraft by visual or radio signals, the intercepted aircraft must request immediate clarification while continuing to comply with instructions given by the intercepting aircraft.

Visual signals for use in the event of interception

Series	Intercepting aircraft signals	Meaning	Intercepted aircraft response	Meaning
Initiated by intercepting aircraft				
1	**Day or night** – Rocking aircraft and flashing navigational lights at irregular intervals (and landing lights in the case of a helicopter) from a position slightly above and ahead of, and normally to the left of, the intercepted aircraft (or to the right if the intercepted aircraft is a helicopter) and, after acknowledgement, a slow level turn, normally to the left (or to the right in the case of a helicopter) on the desired heading (see notes below)	You have been intercepted, follow me	**Day or night** – Rocking aircraft, flashing navigational lights at irregular intervals and following.	Understood, will comply
2	**Day or night** – An abrupt breakaway manoeuvre from the intercepted aircraft consisting of a climbing turn of 90° or more without crossing the line of flight of the intercepted aircraft.	You may proceed	**Day or night** – Rocking the aircraft.	Understood, will comply
3	**Day or night** – Lowering landing gear (if fitted), showing steady landing lights and overflying runway in use (or, if the intercepted aircraft is a helicopter, overflying the helicopter landing area). In the case of helicopters, the intercepting helicopter makes a landing approach, coming to hover near to the landing area.	Land at this aerodrome	**Day or night** – Lowering landing gear (if fitted), showing steady landing lights and following the intercepting aircraft and, if after overflying the runway in use or helicopter landing area landing is considered safe, proceeding to land.	Understood, will comply

Series	Intercepting aircraft signals	Meaning	Intercepted aircraft response	Meaning
4	**Day or night** – Raising landing gear (if fitted) and flashing landing lights while passing over runway in use or helicopter landing area at a height exceeding 300 m (1,000 ft) but not exceeding 600 m (2,000 ft)(or, in the case of a helicopter, at a height exceeding 50 m (170 ft) but not exceeding 100 m (330 ft)) above the aerodrome level and continuing to circle runway in use or helicopter landing area. If unable to flash landing lights, flash any other lights available.	The aerodrome you have designated is inadequate	**Day or night** – If it is desired that the intercepted aircraft follow the intercepting aircraft to an alternate aerodrome, the intercepting aircraft raises its landing gear (if fitted) and uses the Series 1 signals prescribed for intercepting aircraft.	Understood, follow me
			If it is decided to release the intercepted aircraft, the intercepting aircraft uses the Series 2 signals prescribed for intercepting aircraft.	Understood, you may proceed
5	**Day or night** – Regular switching on and off of all available lights but in such a manner as to be distinct from flashing lights.	Cannot comply	**Day or night** – Use Series 2 signals prescribed for intercepting aircraft.	Understood
6	**Day or night** – Irregular flashing of all available lights.	In distress	**Day or night** – Use Series 2 signals prescribed for intercepting aircraft.	Understood

Notes:

1. Meteorological conditions or terrain may require the intercepting aircraft to reverse the positions and direction of turn given above in Series 1.
2. If the intercepted aircraft is not able to keep pace with the intercepting aircraft, the latter is expected to fly a series of race-track patterns and to rock the aircraft each time it passes the intercepted aircraft.

Radio communications during interception

If radio contact is established during interception but communication in common language is not possible, attempts must be made to convey instruction, acknowledgement of instructions and essential information by using the following phrases and pronunciations and transmitting each phrase twice.

Phrases to be used by INTERCEPTED aircraft

Phrase	Pronunciation	Meaning
Callsign[1]	KOL SA-in (callsign)[1]	My callsign is (callsign)
Wilco	VILL-CO	Understood will comply
Can not	KANN -NOTT	Unable to comply
Repeat	REE -PEET	Repeat your instruction
Am lost	AM LOSST	Position unknown
Mayday	MAYDAY	I am in distress
Hijack	HI -JACK	I have been hijacked. Circumstances may not always permit, nor may it be desirable to use the phrase HIJACK
Land (place name)	LAAND	I request to land at (place name)
Descend	DEE-SEND	I require descent

Phrases to be used by INTERCEPTING aircraft

Phrase	Pronunciation	Meaning
Callsign	**KOL** SA-IN	What is your callsign
Follow	**FOL**-LO	Follow me
Descend	DEE-**SEND**	Descend for landing
You land	YOU LAAND	Land at this aerodrome
Proceed	PRO-**SEED**	You may proceed

[1] The callsign required to be given is that used in radiotelephony communications with ATS units and corresponding to the aircraft identification in the flight notification.