

Operating at and around aerodromes is often the most critical phase of a flight. Given the proximity to other aircraft, having a clear knowledge of how to fly around an aerodrome and how to follow the correct procedures on the ground will be very helpful. The information in this chapter is of obvious practical importance and will be well-practiced as flight training is conducted.

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AERODROMES

What are the limitations in using somewhere as an aerodrome or a heliport?

Operating Rules – Use of Aerodromes: CAR Part 91 Subpart 91.127

The rules regarding the use of a place as an aerodrome are fairly obvious but are stipulated within the CAR. They include:

- It is suitable for taking off or landing aircraft being used.
- The pilot complies with any limitations or operational conditions on the use of the aerodrome.
- The aerodrome or heliport has appropriate and operable lighting when used at night and it is activated.
- · Aircraft are kept clear of unsafe manoeuvring areas and obstructions.
- The runway or heliports is clear of animals, vehicles or other obstructions.
- Aircraft operating within the aerodrome circuit do not interfere with other traffic or instrument approaches to other aerodromes.
- For a heliport in a congested area, operations can only be conducted if the physical characteristics, obstacle limitation surfaces, and visual aids are sufficient for the helicopters operating at that heliport.
- For a heliport in a non-congested area, additionally there needs to be a clear area to hover, a surface suitable for touchdown/lift off, and such an approach/take off path is possible so that autorotation landing can be conducted without causing hazard to any person or property.

How are runway numbers designated?

The runway designator is a **two-digit number** based on the whole number of one tenth of the **magnetic bearing** down the centreline of the runway in the direction of the approach. For

example, a runway which is orientated with a magnetic bearing of 082° will be designated Runway 08. When this runway is approached from the opposite direction (magnetic bearing 262°) the runway is designated as Runway 26. The surface of the runway can also be included in the runway designator as there can be parallel runways, e.g., Grass Runway 08.

What do the movement areas of an aerodrome include?

The movement areas of an aerodrome (*Figure 24*) include the apron (parking area), taxiways and landing area (runways):

- Apron the area where an aircraft can park, refuel and load/unload passengers.
- Taxiway the path designated for taxiing an aircraft from one part of the aerodrome to another.
- Landing area the runways which are used for take-off and landings.
- Manoeuvring area the landing area and taxiways (where aircraft movement principally occurs).

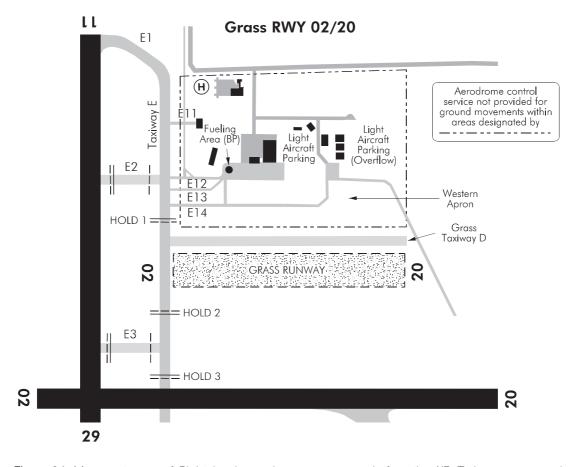


Figure 24. Movement areas of Christchurch aerodrome as an example from the AIP. Taxiways, apron and holding points are clearly marked. © Civil Aviation Authority of New Zealand, supplied by Aeropath Limited.

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APPROACHING AN AERODROME

What are the rules about operating around an aerodrome?

General Flight Rules – Operating on and in the vicinity of an aerodrome: CAR Part 91 Subpart C 91.223

The CARs dictate procedures that need to be followed when operating around an aerodrome. This includes:

- Observe other aerodrome traffic for the purpose of avoiding a collision.
- Maintain a listening watch on the aerodrome frequency when within 10nm and below 3000 ft. AGL (above ground/aerodrome level).
- Unless otherwise authorised or instructed by ATC, conform with or avoid the aerodrome traffic circuit formed by other aircraft.
- Perform a left-hand circuit when approaching for a landing at and after take-off from an
 aerodrome that is published in the AIP. This is unless authorized otherwise by ATC at a
 controlled aerodrome or a right-hand circuit is specified in the AIP.
- Unless otherwise authorised or instructed by ATC, comply with any special aerodrome traffic rules for the aerodrome.

The above does not apply to the pilot in command of an aircraft operating at an aviation event (where the aerodrome is closed to other traffic).

It is never permitted to turn against circuit direction, unless specifically authorized to at a controlled aerodrome.

What is the standard overhead circuit joining procedure for landing at an aerodrome?

Aerodrome Procedures: AIP Vol 1 AD 1.5 – 1

This procedure is used at unattended aerodromes so that all aircraft fly a common pattern to aid collision avoidance. The standard overhead join procedure is published within the AIP. It should be used at unattended aerodromes (no ATC), when the pilot is unfamiliar with the aerodrome or uncertain of aerodrome traffic. The aim of the procedure is to assess

aerodrome wind, traffic and signals in order to determine the runway in use and sequence with the aerodrome traffic.

The Approach

An aircraft must approach the aerodrome at 500 ft. above circuit height. The standard circuit height is 1000 ft. above aerodrome elevation (the height of aerodrome above mean sea level i.e. what the altimeter will read when on the runway). Therefore, the standard approach is at 1500 ft above circuit height. If a circuit height other than 1000 ft. is being used at the aerodrome, it will be published in the AIP.

The approach can be from any direction. During the approach, the aerodrome plate should be read and wind assessment started. Pre-landing checks can be carried out as well as keeping a listening watch for traffic.

The Overhead and Descent

Once overhead, pass with the aerodrome on your left at 500 ft. above circuit height. This should be done close enough to the threshold so that circuit traffic can pass beneath safely. The aim is to view the windsocks to assess wind direction, observe the aerodrome traffic and note any aerodrome signals.

During the overhead if the runway in use can be determined and traffic sequencing permits, all turns should be made in the direction of the circuit. The pilot should then descend on the non-traffic side of the circuit, aiming to cross over the upwind threshold at circuit height. If the aircraft the approach is made from the traffic side of the circuit (*Figure 25*) descent can begin once on the non-traffic side of the circuit.

If an approach is from the non-traffic side of the circuit, an overhead orbit needs to be made at 500 ft. above circuit height. Again, keeping the aerodrome on the left and keeping close to the downwind threshold, an orbit is conducted to remain at 500 ft. above circuit height on the traffic side of the orbit to then begin descent on the non-traffic side, when passing close by the upwind threshold. The orbit continues whilst descending in order to cross over the upwind threshold at circuit height (*Figure 26*).

If during the first overhead pass the pilot cannot ascertain the runway, aerodrome traffic or note ground signals then the aircraft should proceed straight ahead with wings level. The aircraft should continue to a point which is beyond the circuit area (approximately 2 nm) and perform a left turn (*Figure 27*). The aircraft should return to the aerodrome and repeat the assessment until the pilot can ascertain the information required.

Non-Traffic Side

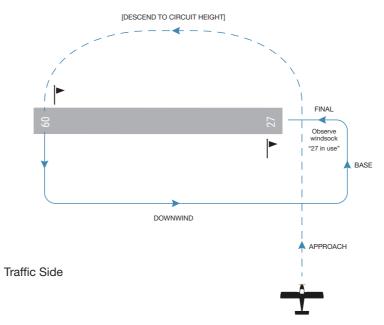


Figure 25. Diagram to show the standard overhead circuit joining procedure approaching from the traffic side of the circuit. The dotted line represents flying at 500 ft. above circuit height and descending to circuit height. The solid lines represent flying at circuit height and descending on final.

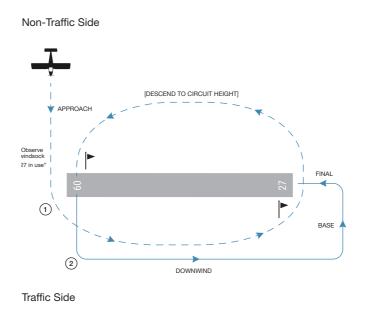


Figure 26. Diagram to show the standard overhead circuit joining procedure approaching from the non-traffic side of the circuit. The dotted line represents flying at 500 ft. above circuit height and descending to circuit height (when returning to the non-traffic side of the circuit). The solid lines represent flying at circuit height and descending on final.

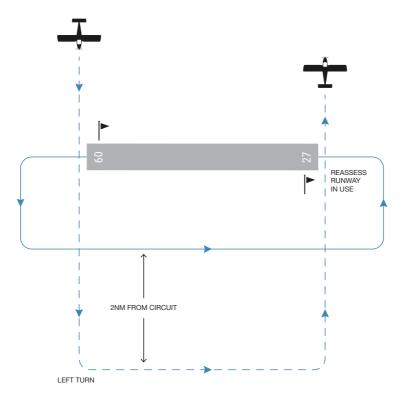


Figure 27. Diagram to represent procedure when unable to assess runway conditions when performing a standard overhead circuit joining procedure. The dotted line represents flying at 500 ft. above circuit height. The procedure shows tracking out 2nm and performing a left turn. The circuit is also shown with Runway 27 in use.

What are the direct circuit joining procedures?

An aircraft may join directly into the circuit at an unattended aerodrome if:

- · The pilot is familiar with the aerodrome
- Intentions are broadcast to the aerodrome traffic
- · The aerodrome traffic and runway in use has been properly assessed
- Traffic sequencing is possible to avoid conflict and retain priority to aircraft already in the circuit
- · Once in the circuit, all turns are made in the direction of the circuit

Any leg of the circuit can be joined (*Figure 28*) but must be joined in the correct direction (e.g. for a left hand circuit, an must join a left hand downwind). If an aircraft is joining final leg, it must be a "long" final from approximately 4 to 8 nm out for a straight in approach.

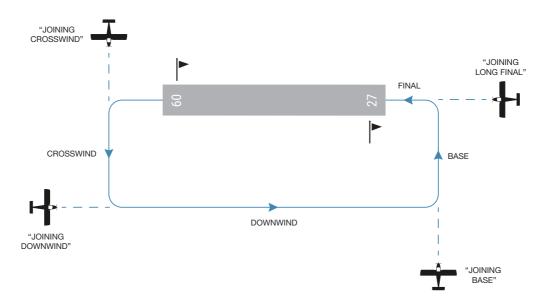


Figure 28. Diagram showing the direct circuit joining options.

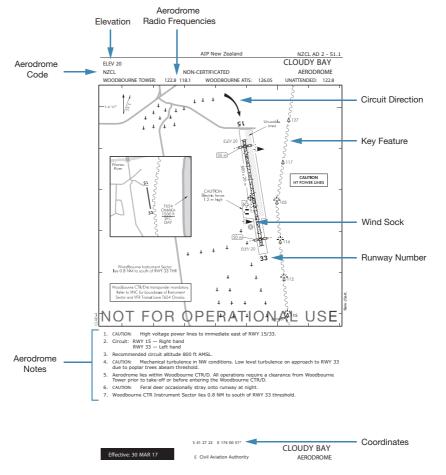


Figure 29. Chart example from AIP of Cloudy Bay Aerodrome with labelling of some of the key information that can be obtained. © Civil Aviation Authority of New Zealand, supplied by Aeropath Limited.

What information is presented in an aerodrome/heliport chart?

Aerodrome Chart Symbols: Vol 1 GEN 2.3 – 1 and Aerodrome Operations: Vol 1 AD 1.5 -1

A large amount of information can be obtained from the aerodrome plates and having working knowledge of this is vital in preparation for flight (*Figure 29*).

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AERODROME MARKINGS

What are the common aerodrome and taxiway markings?

The markings described below generally refer to the markings on larger aerodromes with sealed runways. Grass runways and taxiways are usually marked with boards.

- Runway designations painted in white letters at the threshold of the runway
- Runway centre line painted in white
- Thresholds marked with white stripes ("piano keys") 6 m from the end of the runway end (Figure 30). Thresholds can be permanently or temporarily displaced along the runway to ensure clearance of obstacles during the approach.
- Taxiways marked with yellow paint down the centre line.
- Touchdown zones mainly on runways with IFR approaches (*Figure 31*). These provide a visual reference point.
- Holding positions an intermediate holding position is a single dashed yellow line
 across the runway, whereas an intermediate holding position is a single (usually at
 domestic aerodromes) or double (international) solid yellow line next to a parallel
 dashed yellow line (or two). Note the runway side of the holding point will be from the
 dashed line side (Figure 32).
- Closed runway a closed runway is marked with white crosses, usually two at each end (*Figure 33*).

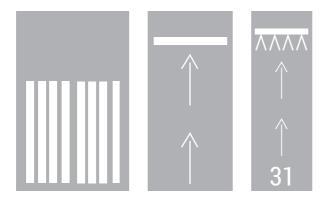


Figure 30. Runway Threshold Markings. The "piano keys" represent the runway threshold (left). If a threshold needs to be displaced, arrows will point towards a thick transverse white line (middle). A temporary displacement will be indicated by winged bars or cones (right).



Figure 31. Touchdown point markings. Rectangular white blocks in parallel to the centreline indicate a touch down point.

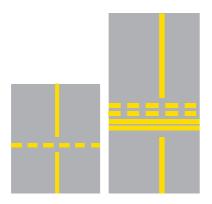


Figure 32. Holding point markings.

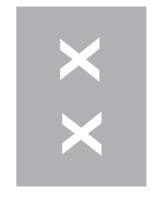


Figure 33. Closed runway markings.

What do the runway lights signify?

The different types of lighting seen on a runway (Figure 34) are:

- Runway Edge Lighting (REDL) identify the edges of runways used at night or for precision approaches. These are normally white.
- Runway Threshold Lighting (RTHL) these are provided if runway edge lighting is present and are usually green and uni-directional.
- Runway End Lighting (RENL) lights which identify runway end and are provided for runways that are used at night or for precision approach runways. They are usually red and unidirectional and signify the maximal manoeuvring area.
- Runway Centre Line Lights (RCLL) these are provided if it is a precision approach
 runway category for major airports and when the runway is intended to be used for
 take-off with a visual range less than 400 m. They are usually white for most of the
 usable runway, change to alternate white/red lights towards the end, and are all red for
 the last portion of the usable runway.

• Runway End Indicator Lighting (REIL) – lights which identify the start of the threshold. They flash white once per second.

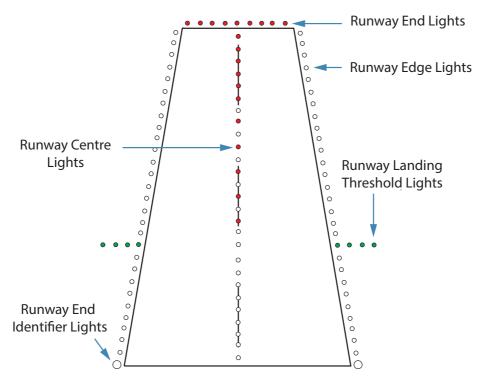


Figure 34. Diagram shows the common runway lights used at larger aerodromes.

What approach lighting systems are available?

Circling Guidance Lighting

Lights which are used to guide aircraft towards the downwind or base leg of a circuit and are usually amber.

Runway Lead in lighting system

Infrequently encountered lighting system which helps guide an approach path.

Pilot Activated Lighting

Pilot Activated Lighting: AD 1.8 – 1

To use an aerodrome at night, unattended aerodromes need the lights switched on. This can be done from the aircraft using a pilot activated lighting system that utilises the radio. A radio frequency will be published in the AIP that usually requires several short transmissions

to switch on the lights. Each aerodrome will have its own instructions and can be found in the AIP. Alternatively, Christchurch Information (National Briefing Office) can switch lights upon request.

Aerodrome Beacons

Beacons may be placed at a high feature of an aerodrome to help with its sighting in poor visibility conditions or at night. Aerodromes with these beacons and their description will be featured in the AIP NZ and usually are white, flash between 12 to 30 times per minute and can be viewed from all angles.