

OFFICIAL



Australian Government
Civil Aviation Safety Authority

**ADVISORY CIRCULAR
AC 91-10 v1.4**

**Operations in the vicinity of non-
controlled aerodromes**

File ref: D25/33971

May 2025

OFFICIAL



Acknowledgement of Country

The Civil Aviation Safety Authority (CASA) respectfully acknowledges the Traditional Custodians of the lands on which our offices are located and their continuing connection to land, water and community, and pays respect to Elders past, present and emerging.

Artwork: James Baban.

Advisory circulars are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.

Advisory circulars should always be read in conjunction with the relevant regulations.

Audience

This advisory circular (AC) applies to operators and pilots who operate at, or in the vicinity of, non-controlled aerodromes in all types of aircraft.

Purpose

This AC provides guidance on procedures that, when followed, will improve situational awareness and safety for all pilots when flying at, or in the vicinity of, non-controlled aerodromes.

This AC should be read in conjunction with [AC 91-14 - Pilots' responsibility for collision avoidance in the vicinity of non-controlled aerodromes using 'see-and-avoid'](#).

For further information

For further information or to provide feedback on this AC, visit CASA's [contact us](#) page.

Unless specified otherwise, all subregulations, regulations, Divisions, Subparts and Parts referenced in this AC are references to the *Civil Aviation Safety Regulations 1998 (CASR)*.

Status

This version of the AC is approved by the National Manager, Flight Standards Branch.

Note: Changes made in the current version are annotated with change bars.

Table 1: Status

Version	Date	Details
v1.4	May 2025	Amended acronyms and definitions. Added new subheadings to Chapters 2 and 4. Updated introduction to reinforce see and avoid principles, and effective communication use. Removal of the word 'active' when associated with a runway being used by an aircraft. Replaced with 'preferred' in most instances. Minor table numbering amendments.
v1.3	January 2025	Addition of advice regarding new technology associated with Garmin Emergency Auto Land (EAL) to section 6.4.7.
v1.2	August 2024	Chapter 3: <ul style="list-style-type: none">content related to radio reports and broadcasts moved to Chapter 8content about radio unserviceability and circumstances where no radio is carried moved from Chapter 8 to Chapter 3. Chapter 7: <ul style="list-style-type: none">moved content related to maximum speed within Chapter 7added content about overtaking in the circuit. Chapter 8: <ul style="list-style-type: none">Added 2 new tables to section 8.1 that list the mandatory radio reports and broadcasts from sections 21.06, 21.07 and 21.09 of the Part 91 MOS, as these requirements often apply to operations at or near non-controlled aerodromes.Emphasised the criticality of position and tracking information in uncontrolled airspace radio calls being accurate.Re-ordered content to be easier to read and comprehend.
v1.1	November 2021	Paragraphs 6.3.3 and 6.3.4 have been amended to correctly reflect the provisions of regulation 91.370 of CASR.
v1.0	October 2021	This AC replaces CAAP 166-01 (v4.1).

Contents

1	Reference material	7
1.1	Acronyms	7
1.2	Definitions	8
1.3	References	10
2	Introduction	12
2.1	Scope	12
2.2	Variety of aircraft	12
2.3	Radio usage key message	12
2.4	Variety of potential runways in use	12
3	Radio carriage requirements at non-controlled aerodromes	13
3.1	Guidance on the rules	13
3.2	Possible radio carriage requirements from aerodrome operators	14
3.3	Flight with an unserviceable radio	15
3.4	Non radio-qualified pilot or non-radio equipped aircraft	16
4	Recommended safety actions (other than radio)	17
4.1	General recommendations	17
4.2	Aircraft equipment recommendations	17
5	The traffic mix	18
5.1	Larger passenger transport aircraft operations	18
5.2	Glider operations	18
5.3	Parachuting operations	18
5.4	Rotorcraft operations	19
5.5	Basic ultralight aircraft operations	19
5.6	Fixed-wing and rotary-wing aerial application (agricultural) aircraft operations	20
5.7	Balloons and hot-air airships	20
5.8	Training operations	20
5.9	Military operations	21
5.10	Aerodrome works	21
5.11	Uncharted aerodromes and ALAs	21
6	Other hazards	22
6.1	Aircraft size and performance	22
6.2	Downwind take-offs and landings	22
6.3	Safety during take-off and landing	22
6.4	Avoiding collision in the traffic circuit	24
6.5	IFR and VFR aircraft operating simultaneously at, or in the vicinity of, the same non-controlled aerodrome	24
6.6	Practice instrument approaches	25
6.7	Wake turbulence and windshear	25
7	Standard traffic circuit procedures	27
7.1	Familiarisation with weather conditions	27

7.2	Traffic circuit direction	27
7.3	Circuit heights	27
7.4	Arrival procedures	28
7.5	Maximum speed	30
7.6	Overtaking in the circuit	30
7.7	Joining on base leg	30
7.8	Final approach	31
7.9	Straight-in approaches	31
7.10	Go-arounds	31
7.11	Departing the circuit area	33
7.12	Transiting and overflying en-route	33
7.13	Night circuits	33
8	Radio calls and usage (reports and broadcasts)	34

8.1	Fundamentals of correct radio calls	34
8.2	Radio calls and collision avoidance	34
8.3	Radio frequency to use for broadcasts	35
8.4	Radio frequency congestion advice	36
8.5	Mandatory broadcasts	36
8.6	Recommended broadcasts in the vicinity of a non-controlled aerodrome	39

1 Reference material

1.1 Acronyms

The acronyms and abbreviations used in this AC are listed in the table below.

Table 2: Acronyms

Acronym	Description
AA	Airservices Australia
AFM	aircraft flight manual
AFRU	aerodrome frequency response unit
AIP	aeronautical information publication
ALA	aeroplane landing area
ATS	air traffic services
AvSEF	aviation state engagement form
CA/GRS	certified air/ground radio service
CAAP	Civil Aviation Advisory Publication
CASA	Civil Aviation Safety Authority
CASR	<i>Civil Aviation Safety Regulations 1998</i>
CTAF	common traffic advisory frequency
ERSA	En Route Supplement Australia
GPS	global positioning system
IAS	indicated airspeed
IFR	instrument flight rules
NOTAM	Notice to Airmen
SAR	search and rescue
SFC	surface (level)
UNICOM	universal communications
VFR	visual flight rules
VHF	very high frequency
VMC	visual meteorological conditions

1.2 Definitions

Terms that have specific meaning within this AC are defined in the table below. Where definitions from the civil aviation legislation have been reproduced for ease of reference, these are identified by 'grey shading'. Should there be a discrepancy between a definition given in this AC and the civil aviation legislation, the definition in the legislation prevails.

Table 3: Definitions

Term	Definition
aerodrome control service	Has the same meaning as in Annex 11 to the Chicago Convention. Aerodrome control service. Air traffic control service for aerodrome traffic.
aerodrome elevation	The elevation of the highest point of the landing area.
aerodrome traffic	All traffic on the manoeuvring area of an aerodrome and all aircraft flying in the vicinity of an aerodrome. Note: An aircraft is in the vicinity of an aerodrome when it is in, entering or leaving an aerodrome traffic circuit.
aeronautical chart	Aeronautical charts include the ERC-H, ERC-L, VNC, VTC, TAC, PCA and WAC. Note: All aerodromes in the Airservices Australia database will be published on the VNCs and VTCs with WACs being progressively updated.
airmanship	The consistent use of good judgement and well-developed knowledge, skills and attitudes to achieve flight objectives.
airprox event	A situation in which, in the opinion of a pilot or air traffic services personnel, the distance between aircraft as well as their relative positions and speed have been such that the safety of the aircraft involved may have been compromised.
air traffic control service	has the same meaning as in Annex 11 to the Chicago Convention. Air traffic control service. A service provided for the purpose of: 1. preventing collisions: a. between aircraft, and b. on the manoeuvring area between aircraft and obstructions; and c. expediting and maintaining an orderly flow of air traffic.
air traffic service	A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service). Note: A certified air/ground radio service (within the meaning of regulation 139.390) is not an air traffic service.
Air Traffic Services	Any of the following, in its capacity as a provider of an air traffic service: • AA; • the Defence Force; • an ATS provider.
mandatory broadcast area	A defined airspace volume in Class G airspace within which certain mandatory radio broadcasts are required on a common frequency, and within which all operations must be monitoring the published common frequency.

Term	Definition
	Note: Charts are annotated: "For operations in this area SFC - (altitude) use CTAF (frequency)".
certified air/ground radio service	<p>An aerodrome-based radio information service, which may operate at non-controlled aerodromes and which is not an air traffic service provided by Airservices Australia or the Royal Australian Air Force.</p> <p>Note: The service is operated by or for the aerodrome operator to published hours on the CTAF assigned to a particular aerodrome. The service is a safety enhancement facility which provides pilots with operational information relevant to the aerodrome.</p>
certified aerodrome	An aerodrome in respect of which an aerodrome certificate is in force.
common traffic advisory frequency	<p>A designated frequency on which pilots make positional broadcasts when operating in the vicinity of a non-controlled aerodrome.</p> <p>Note: Although not included in the formal definition in the Part 91 MOS, the designated frequency for a Mandatory Broadcast Area (MBA) may also be colloquially referred to as a CTAF.</p>
in the vicinity of a non-controlled aerodrome:	<p>An aircraft is in the vicinity of a non-controlled aerodrome if it is:</p> <ol style="list-style-type: none"> 1. in uncontrolled airspace; and 2. within 10 nautical miles of the aerodrome; and 3. at a height above the aerodrome that could result in conflict with operations at the aerodrome.
military aerodrome	An aerodrome controlled by a part of the Defence Force.
non-controlled aerodrome	<p>An aerodrome at which an aerodrome control service is not operating.</p> <p>Note: A non-controlled aerodrome might be any of the following:</p> <ul style="list-style-type: none"> - an aerodrome that is always in Class G airspace; - an aerodrome that would normally have an aerodrome control service, but such services are temporarily unavailable.
NOTAM	A notice containing information concerning the establishment, condition or change in a facility, service, procedure or hazard, which is essential to flight operations personnel.
preferred runway	<p>The runway available and suitable to be used by an aircraft that is:</p> <ol style="list-style-type: none"> a. most closely aligned into the prevailing wind <p>or</p> <ol style="list-style-type: none"> b. in nil wind or predominantly all crosswind conditions, the runway already in use by other aircraft. <p>Note: This definition does not, in any way, seek to prohibit a pilot in command from deciding to utilise another runway for safety or rule compliance reasons. For example, for compliance with regulatory aircraft performance requirements.</p>
runway strip	<p>means a defined area at an aerodrome, including the runway and stopway (if any) to which it relates, that is intended to:</p> <ol style="list-style-type: none"> a. reduce the risk of damage to aircraft running off the runway; and b. protect aircraft flying over the area during take-off, landing or a missed approach.

Term	Definition
UNICOM	A non-ATS communication service provided by an aerodrome operator or user to enhance the value of information normally available about a non-controlled aerodrome.

1.3 References

Legislation

Legislation is available on the Federal Register of Legislation website <https://www.legislation.gov.au/>

Table 4: Legislation references

Document	Title
Part 91 of CASR	General operating and flight rules
Part 91 MOS Chapter 25	Use of radio - broadcasts and reports
Subdivision 91.D.4.6	Avoiding collisions at or in the vicinity of aerodromes
Regulation 91.325	Basic rule
Regulation 91.330	Right of way rules
Regulation 91.335	Additional right of way rules
Regulation 91.340	Right of way rules for take-off and landing
Regulation 91.360	Meaning of <i>in the vicinity of a non-controlled aerodrome</i>
Regulation 91.370	Take-off or landing at non-controlled aerodrome - all aircraft
Regulation 91.375	Operating on manoeuvring area, or in the vicinity, of a non-controlled aerodrome - general requirements
Regulation 91.380	Operating on manoeuvring area, or in the vicinity, of a non-controlled aerodrome - landing and taking off into wind
Regulation 91.385	Operating on manoeuvring area, or in the vicinity, of a non-controlled aerodrome - requirements that apply after joining the circuit pattern
Regulation 91.390	Operating on manoeuvring area, or in the vicinity, of non-controlled aerodrome - requirements relating to maintaining the same track after take-off
Regulation 91.395	Straight-in approaches at non-controlled aerodromes
Regulation 91.400	Communicating at certified, registered, military or designated non-controlled aerodromes
Regulation 91.640	Use of radio outside of controlled airspaces - listening watch of radio transmissions

Advisory material

CASA's advisory materials are available at <https://www.casa.gov.au/publications-and-resources/guidance-materials>

Table 5: Advisory material references

Document	Title
AC 91-02	Guidelines for smaller aeroplanes - suitable places to take-off and land
AC 91-14	Pilots' responsibility for collision avoidance in the vicinity of non-controlled aerodromes using 'see and avoid'
AC 91-23	ADS-B for enhancing situational awareness
AC 91-29	Guidelines for helicopters - suitable places to take-off and land
Resource booklet 8 threat and error management	Safety behaviours and human factors for pilots resource kit Note: Available from https://www.casa.gov.au/safety-management/human-factors .

2 Introduction

2.1 Scope

- 2.1.1 This AC provides guidance on procedures that, when followed, will improve situational awareness and safety for all pilots when flying at, or in the vicinity of, non-controlled aerodromes.
- 2.1.2 This AC should be read in conjunction with [AC 91-14 - Pilots' responsibility for collision avoidance in the vicinity of non-controlled aerodromes using 'see-and-avoid'](#).
- 2.1.3 It is strongly recommended that pilots of radio-equipped aircraft use the 'standard' traffic circuit and radio broadcast procedures outlined in sections 7 and 8 at all non-controlled aerodromes.

2.2 Variety of aircraft

- 2.2.1 Non-controlled aerodromes can cater for flights conducted under both the instrument flight rules (IFR) and the visual flight rules (VFR) by a mix of aircraft, including:
- larger turboprop, jet and powered lift aircraft
 - smaller aircraft operated both commercially and privately
 - agricultural aircraft
 - military aircraft
 - various sport and recreational aircraft.
- 2.2.2 This can present many challenges to pilots who operate into, out of, or in the vicinity of these aerodromes. In addition to being aware of the potential aircraft and operational mix at a non-controlled aerodrome, pilots must be cognisant of general operational safety matters, such as right of way rules, collision avoidance and wake turbulence.

2.3 Radio usage key message

- 2.3.1 See and avoid principles are, at all times, critical to the safe operation of aircraft. However, to effectively monitor for potential hazards, using see and avoid is further enhanced when combined with effective radio communication.
- 2.3.2 Pilots also need to consider radio communication limitations, for example unserviceability or over-transmission when operating within the vicinity of non-controlled aerodromes.

2.4 Variety of potential runways in use

- 2.4.1 Pilots and operators are reminded a runway that is serviceable should be considered available for use, and potentially in use, at any time by other aircraft.
- 2.4.2 Non-controlled aerodromes have a wide variety of different runway surfaces, lengths and other characteristics that may be preferred by other pilots in command for multiple reasons.

3 Radio carriage requirements at non-controlled aerodromes

Note: Information on the mandatory and recommended radio calls in various circumstances is contained in Chapter 8 of this AC.

3.1 Guidance on the rules

3.1.1 Regulation 91.400 contains rules related to the carriage of an operative radio in the vicinity of, or on the manoeuvring area of, certified, military and certain designated non-controlled aerodromes.

3.1.2 In summary, if an aircraft is not carrying an operative radio in these circumstances, then the radio must have either:

- become inoperative during the flight, noting that there are additional conditions in the regulation for this circumstance
- or
- the aircraft must be flying in company with another aircraft that has an operative radio, noting that there are also additional conditions for this circumstance in the regulation.

Note: The specific aerodromes that are *designated non-controlled aerodromes* are listed in Chapter 17 of the Part 91 MOS. At the time of publishing v1.4 of this AC, there were no aerodromes listed as designated non-controlled aerodromes.

3.1.3 For Part 91 operations in Class G airspace, the main requirement for the carriage of radio communication equipment is based on altitude and weather conditions expected to be encountered during a flight. These rules are contained in section 26.18 of the Part 91 MOS.

3.1.4 The radio carriage requirements prescribed by the Part 91 MOS do not apply to aircraft conducting an air transport operation under Parts 121, 133 or 135. The radio carriage requirements for an aircraft conducting a Part 121, Part 133 or Part 135 operation are contained in section 11.08 of the Part 121, Part 133 and Part 135 MOS.

Note: When required to be fitted, a radio communication system must allow the pilot to meet reporting, broadcast and listening watch requirements, to conduct 2-way voice communications and communicate on the aeronautical emergency frequency 121.5 Mhz.

3.1.5 A summary of the radio carriage requirements of section 26.18 of the Part 91 MOS is shown below/in Table 6:

Table 6: Summary of radio carriage requirements from section 26.18 of the Part 91 MOS

Flight rules	Altitude	Weather conditions	Carriage of radio required?
All	Above 5 000 ft AMSL	All	Yes

Flight rules	Altitude	Weather conditions	Carriage of radio required?
IFR, Night VFR	Below 5 000 ft AMSL	All	Yes
Day VFR	Below 5 000 ft AMSL	Able to maintain 1000 ft vertical and 1500 m horizontal clearance from cloud	No
Day VFR	Below 3 000 ft AMSL or 1 000 ft AGL	Only able to remain clear of cloud – see paragraph 3.1.7 below)	Yes

3.1.6 The carriage of radio equipment is intended to be a mitigator to some of the risks associated with operations close to cloud and at low altitudes. Therefore, aircraft operating closer to cloud and at lower altitudes must be fitted with a radio communication system.

3.1.7 Table 7 and the following points clarify these concepts.

- The VMC criteria prescribed by the Part 91 MOS differentiates between operations below 10 000 ft AMSL and operations at or below 3 000 ft AMSL/1000 ft AGL as shown in Table 7.
- The VMC criteria for operations at or below 3 000 ft AMSL/1000 ft AGL are intended to be an alleviation to the below 10 000 ft AMSL criteria that otherwise can be quite restrictive when operating at lower altitudes.
- The use of these alleviating criteria, being clear of cloud and at or below 3 000 ft AMSL/1000 ft AGL, requires the use of radio equipment. .

Table 7: Excerpt from VMC criteria - Division 2.4 of the Part 91 MOS

Type of aircraft	Class of airspace	Height	Flight visibility	Distance from cloud
All	A, B, C, E or G	Below 10 000 ft AMSL	5 000 m	1 500 m horizontal 1 000 ft vertical
Aircraft	G	At or below whichever is the higher of: (a) 3 000 ft AMSL; (b) 1 000 ft AGL.	5 000 m	Clear of cloud

3.1.8 While aircraft operating in better weather are not required to carry radiocommunication equipment, by not doing so a pilot is limiting the operations available – not being able to operate in the vicinity of a certified, military or other prescribed aerodrome being just one such limitation.

3.2 Possible radio carriage requirements from aerodrome operators

3.2.1 Despite the relevant civil aviation legislation not requiring the carriage of radio equipment when operating at an uncertified aerodrome, an aerodrome operator may require it as a condition of use for operations on the ground at an aerodrome.

3.2.2 This is consistent with the authority of an aerodrome operator to require prior permission for its use. It is recommended that a standard entry is included in the ERSA FAC under Local Traffic Regulations that 'Carriage and use of radio is required by AD OPR'. See the example in Figure 1.


WATTS BRIDGE **ELEV 300**

FULL NOTAM SERVICE NOT AVBL

QLD
270544S
AD OPR Watts Bridge Memorial Airfield Association, PO Box 98, Toogoolawah,
QLD, 4313. Email: info@wattsbridge.com.au. PH 0427 699 239.
Website: www.wattsbridge.com.au.

1522735E
UTC +10
VAR 11 DEG E

YWSG
UNCR



REMARKS

1. PPR for all commercial OPS, including flight training.
2. Commercial training operations, charges and/or conditions apply. Operators contact info@wattsbridge.com.au.

HANDLING SERVICES AND FACILITIES
AVGAS available - self serve swipe card - MC and VISA card only.

PHYSICAL CHARACTERISTICS
DTHR exists on both RWY 21 and RWY 12R.

ATS COMMUNICATIONS FACILITIES
FIA BRISBANE CENTRE 129.0 Circuit Area

LOCAL TRAFFIC REGULATIONS

1. Carriage and use of radio is required by AD OPR.
2. Access to RWY 12L and 30R at RWY ends only.
3. Drainage ditches flank each TWY. Taxi on mown SFC and exit TWY to parking areas by marked access points only.

Figure 1: Uncertified aerodrome as depicted in the ERSA (highlights added)

3.3 Flight with an unserviceable radio

- 3.3.1 At non-controlled aerodromes where the carriage of radio is required, regulation 91.400 allows for continuation of a 'no radio' arrival or departure if a radio failure occurs during the flight, or the sole purpose of the flight is to relocate the aircraft for repairs to the radio, provided the:
- aircraft's landing lights, anti-collision lights and transponder are turned on if fitted to the aircraft
 - pilot joins the circuit on the cross wind or downwind leg of the circuit.
- 3.3.2 Joining the circuit at a standard point affords other traffic in the circuit the best chance of making visual contact. Pilots should be mindful that other circuit users simply might not expect an unannounced aircraft to be in the circuit.
- 3.3.3 When a radio failure seems to have occurred, continuing to make standard broadcasts is suggested. Not being able to receive broadcasts might indicate a radio failure, however, the system might still be broadcasting.
- 3.3.4 A pilot should avoid planning to arrive at, or depart from, an aerodrome for radio repairs during scheduled air transport operations. For aerodromes where there is a UNICOM or CA/GRS, pilots should, where possible, advise their intentions by non-radio means before take-off or landing.

3.4 Non radio-qualified pilot or non-radio equipped aircraft

- 3.4.1 At non-controlled aerodromes where the carriage of radio is required, regulation 91.400 makes provision for flight to be conducted where the aircraft is not carrying an operative radio to operate in the vicinity of these non-controlled aerodromes.
- 3.4.2 The 'non-radio' aircraft must only be operated:
- in VMC during the day
 - to arrive or depart under the escort of another aircraft (what the regulation calls 'conducted in company with the other aircraft') that is radio-equipped and flown by a radio-qualified pilot.
- 3.4.3 Radio calls that are required to be made under regulation 91.630 and Chapter 21 of the Part 91 MOS can be made by the pilot of the escort aircraft on behalf of both aircraft.

Note: There is a published acceptable means of compliance related to an operative radio aircraft accompanying a non-radio aircraft in these circumstances: see AMC 1 in the AMC 91.055 entry in the Part 91 AMC/GM document.

- 3.4.4 Pilots in these situations, or with an unserviceable radio, may also notify ATS of their intentions so that information of their operation can be passed to other aerodrome traffic.

4 Recommended safety actions (other than radio)

4.1 General recommendations

- 4.1.1 Subdivision D.4.6 of CASR Part 91 prescribes the requirements for avoiding collisions when operating in the vicinity of a non-controlled aerodrome.
- 4.1.2 Prior to flight, pilots should consult the current ERSA and NOTAMs to ascertain whether carriage of radio is required, special circuit procedures apply or, in the case of NOTAMs, whether the information contained within the ERSA has been modified.
- 4.1.3 Prior to operating at any non-controlled aerodrome, pilots should satisfy themselves that it is suitable for their operation by reference to ERSA, other commercial aerodrome guides, the company operations manual or by contacting the aerodrome operator. Also refer to [AC 91-02 - Guidelines for aeroplanes with MTOW not exceeding 5 700 kg - suitable places to take off and land](#) and [AC 91-29 - Guidelines for helicopters - suitable places to take-off and land](#) for information on being satisfied the aerodrome is a suitable place to take-off or land.

4.2 Aircraft equipment recommendations

- 4.2.1 At night, and when operating on the movement area of an aerodrome, aircraft must display navigation lights. At other times and during other operations, the ability to see and avoid aircraft is enhanced using external navigation lights so their display is recommended. These lights should be kept on until the aircraft has landed and is clear of all runways.
- 4.2.2 Transponders can be detected by other aircraft equipped with an Airborne Collision Avoidance System (ACAS), allowing them to 'see' other aircraft and take action to avoid conflict or collision. Pilots of transponder-equipped aircraft should, when airborne, ensure their transponder is selected to ON/ALT (Mode C).

5 The traffic mix

5.1 Larger passenger transport aircraft operations

- 5.1.1 At certain non-controlled aerodromes, air transport operators and corporate operators may be operating turboprop, jet, or powered lift aircraft. These aircraft are likely to have different operating parameters/criteria to many smaller aircraft. They typically operate under the IFR and are generally operated in accordance with company Standard Operating Procedures. Because of the high nose angle associated with flying a large aircraft at slow speeds, flight crew may find it difficult to see other, smaller aircraft below their flight path, particularly on approach. It is important that pilots of smaller aircraft not simply assume that flight crew of larger aircraft are aware of their position.
- 5.1.2 Pilots should be aware that, in certain circumstances, passenger transport aircraft may not be able to use the preferred runway. Passenger transport aircraft are required to 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 preferred runway. Similarly, landing into wind may not always be possible when relevant performance limitations are taken into account.
- 5.1.3 Pilots flying recreational, sport or general aircraft should consider giving way to commercial aircraft if this can be done safely and without undue inconvenience to their own operation. Operators of commercial aircraft should never expect a 'give way' offer to be assumed or automatic. Any offer to give way must be explicit and its acceptance acknowledged.

5.2 Glider operations

- 5.2.1 Glider operations can be conducted from a runway, a glider strip parallel to a runway, or a glider strip located away from a runway. 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.
- 5.2.2 A double white cross displayed at the end of a strip indicates that the strip is not only used in for glider operations, but also shorter than the adjacent runway. Aeronautical charts also use the double cross to indicate areas where glider operations take place. Some gliders operating adjacent to the CTAF area may be operating on a frequency different frequency to the CTAF or Area VHF; the gliding frequencies are 122.5, 122.7 and 122.9 MHz.
- 5.2.3 Winch operations may occur at any aerodrome and launch gliders up to heights in excess of 2 000 ft AGL. Pilots should be aware of winch wires up to these levels, particularly when overflying the aerodrome, and check the ERSA for operational information.
- 5.2.4 Gliders landing on the preferred runway may not be able to give way to other aircraft.
- 5.2.5 Pilots should be aware that gliders may not necessarily follow a standard traffic pattern.

5.3 Parachuting operations

- 5.3.1 Aeronautical charts depict parachute symbols at aerodromes where known parachute operations occur. The ERSA also details the aerodromes where parachute operations are conducted. Where operations are conducted at certified or military aerodromes, pilots should also consult the latest NOTAMs for any additional information.
- 5.3.2 In certain circumstances, parachute descents through cloud are permitted in Australia. 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 VHF and the CTAF.

- 5.3.3 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 aircraft is essential to avoid flying into a drop zone area.

5.4 Rotorcraft operations

- 5.4.1 When operating in the vicinity of an aerodrome, in the circumstances listed below, helicopter pilots can choose to fly a circuit pattern similar to a fixed-wing aircraft but on the other side of the runway from the active circuit pattern. This pattern is typically conducted at a circuit height of 500 ft AGL and closer (compared to most fixed wing aircraft) to the runway. The circumstances are:

- the associated helicopter landing site is outside the runway strip in use
- the non-standard circuit pattern does not cross the extended centreline of the runway in use
- pilots broadcast their intentions.

Note: Pilots are advised to check the relevant ERSA entry for any noise abatement procedures.

- 5.4.2 Helicopters may turn onto their departure heading at any height after take-off, provided it is safe to do so¹.
- 5.4.3 When approaching to land at a marked helipad or suitable clear area, helicopter pilots should avoid the flow of fixed-wing aircraft.
- 5.4.4 For aerodromes with both glider and helicopter operations, helicopter pilots should follow the standard traffic patterns to avoid gliders that may be flying modified circuit patterns.
- 5.4.5 Pilots flying aircraft other than helicopters should be aware that helicopter operations are not restricted to helipads. Some rotorcraft, particularly when operating at a high take-off weight, require the use of a runway to accelerate to take-off speeds in a similar way to aeroplanes.
- 5.4.6 Helicopters and gyroplanes can fly slower 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.
- 5.4.7 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 where applicable.

5.5 Basic ultralight aircraft operations

- 5.5.1 The term *basic ultralight* is used to describe privately built, single-place aircraft with a maximum take-off weight of up to 355 kg (depending on its type and configuration). They are either gyroplanes or aeroplanes and will typically have slow operation speeds (stall speeds might be as low as 35 kts. Pilots of ultralight aircraft should conduct their standard circuit at 500 ft above aerodrome elevation.
- 5.5.2 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 spacing from higher and faster traffic.
- 5.5.3 Ultralight aircraft pilots who choose to use the overfly procedure above the circuit height should be aware that:
- ultralight aircraft are difficult to sight, particularly for faster, larger aircraft

¹ See regulation 91.390 of CASR.

- faster, larger aircraft create significant wake turbulence that may 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 – prior to 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.

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

Notes:

1. Helicopters may also be operating in the circuit at 500 ft above aerodrome elevation.
2. Part 103 prescribes operational requirements for sport and recreation aircraft.

5.6 Fixed-wing and rotary-wing aerial application (agricultural) aircraft operations

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

5.6.2 Aerial application operations frequently involve low-level manoeuvring after take-off and prior to landing. These low-level manoeuvres are not required to conform to the standard traffic circuit. However, pilots of other aircraft can expect aerial application (agricultural) aircraft to:

- maintain a listening watch and broadcast their intentions on the CTAF
- give priority to other traffic.

5.7 Balloons and hot-air airships

5.7.1 Aerodromes at which balloons and hot-air airships operate are marked on charts with the balloon symbol. Powered aircraft must give way to balloons. Depending on their qualifications, when overflying a non-controlled aerodrome pilots of balloons and hot-air airships are permitted to operate as low as 1 500 ft above aerodrome elevation. They are required to broadcast their position and intentions on the CTAF.

5.7.2 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.

5.8 Training operations

5.8.1 Many aerodromes are used for training purposes in all kinds of aircraft. Pilots using these aerodromes should be conscious of the potential for non-standard operations by training aircraft in the vicinity, some of which may be piloted by low-hour and student pilots. Where possible, pilots should try to become familiar with the call-signs of training aircraft and take extra care to avoid any conflict by repeating broadcasts or asking for confirmation from the other aircraft when unsure of its intentions.

5.9 Military operations

- 5.9.1 Military aircraft may operate at any aerodrome, sometimes using non-standard civil procedures, such as 'initial and pitch' (refer to AIP-ENR for information on the military initial and pitch circuit procedures). Both large military aircraft and fast military aircraft may be operating levels lower than civil aircraft.

5.10 Aerodrome works

- 5.10.1 Pilots departing or approaching an aerodrome should be aware that aerodrome works may be in progress. The aerodrome operator is not required to issue a NOTAM for minor maintenance or repairs if the runway can be vacated and returned to serviceability in 10 minutes. Otherwise, the works will be notified by NOTAM.
- 5.10.2 If at any time pilots are unsure about their right to land at an aerodrome, they should contact the aerodrome operator for permission and get up-to-date information on the manoeuvring area and facilities. Where conditions on the use of the aerodrome are published in the ERSA, pilots are obliged to operate to those conditions.

5.11 Uncharted aerodromes and ALAs

- 5.11.1 Publishing aerodromes or ALAs on an aeronautical chart gives non-local pilots the necessary awareness to plan and take appropriate action when operating in the vicinity. If an aerodrome or ALA is not published on aeronautical charts, non-local pilots may not be aware that flying activities are taking place at that location. The situation is exacerbated if local operations use a frequency other than Area VHF.
- 5.11.2 To ensure common awareness and consistent local practice, CASA recommends that those locations at which multiple aircraft operations take place are published on aeronautical charts. The default CTAF for published locations is 126.7 MHz. This not only provides a common frequency for pilots to monitor and make broadcasts when operating locally, but also assists non-local pilots to be 'alerted' about potentially conflicting traffic.
- 5.11.3 CASA is taking steps to publish as many known aerodromes and ALAs as possible on aeronautical charts i.e., those in Airservices Australia's database. Owners of uncharted aerodromes and ALAs used by multiple aircraft are encouraged to submit details for publication.

6 Other hazards

6.1 Aircraft size and performance

- 6.1.1 Pilots should be aware that contemporary jet and large turbo-prop aircraft are increasingly capable of using short runways of varying surfaces. More typically, however, runways of 1 400 m or more in length can accommodate jet or large turboprop aircraft operations. Runway lengths are published in the ERSA.
- 6.1.2 Pilots of air transport operations and other professional operations should be aware that, at many of the aerodromes they operate into, other general aviation aircraft, gliders and ultralight aircraft may also be operating.

6.2 Downwind take-offs and landings

- 6.2.1 Take-off or landing must be conducted into wind to the extent practicable (regulation 91.380). Most aircraft operating at an aerodrome will be taking off and landing on the runway most closely aligned into wind; therefore taking off and landing downwind is not recommended. However, it should be noted that aircraft operating procedures might require the use of a runway not aligned with the prevailing wind.
- 6.2.2 Where it is not practicable to land or take-off into wind, pilots must operate within the limitations prescribed in the aircraft flight manual instructions (regulation 91.095) and be satisfied that traffic conditions at the aerodrome will allow such a take-off or landing can be conducted safely.
- 6.2.3 Pilots should consider the following hazards if planning to take-off or land downwind:
- the wind strength just above ground level may be significantly stronger than indicated by the windsock
 - windshear on take-off can result in the following outcomes:
 - 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 on landing can result in the following outcomes:
 - higher groundspeed at touchdown
 - a longer landing distance required.

6.3 Safety during take-off and landing

- 6.3.1 The right-of-way rules for take-off and landing at a non-controlled aerodrome are prescribed by regulations 91.330 and 91.340. The rules that explicitly apply to take-off and landing are as follows:
- Any aircraft must give way to an aircraft that is compelled to land because of an emergency.
 - Any aircraft (whether in flight or operating on the ground or water) must give way to an aircraft that is in the final stages of landing.
 - When two heavier-than-air aircraft are conducting an approach to land at an aerodrome:

- the higher aircraft must give way to the lower aircraft
- however, if the higher aircraft is in the final stages of an approach to land, the lower aircraft must not take advantage of the higher aircraft's need to give way by cutting in front of the higher aircraft
- a power-driven heavier-than-air aircraft must give way to an unpowered glider.

6.3.2 Ultimately, the intent of regulation 91.340 is that pilots exhibit suitable levels of airmanship to ensure they do not create a hazard to another aircraft, a person, a vessel, a vehicle or a structure.

6.3.3 In addition to the general right of way rules, rules for take-off or landing are prescribed by regulation 91.370. The rules for take-off are that a pilot must only commence take-off when:

- another aircraft departing the same runway has crossed the upwind end of the runway or has commenced a turn
- the other aircraft must have become airborne and be at least 1 800 m beyond the proposed point of lift-off of the subject aircraft (only applies if the runway is longer than 1 800 m)
- if the other aircraft and the pilot's aircraft both have a maximum take-off weight below 2 000 kg, the other aircraft is airborne and at least 600 m beyond the proposed point of lift-off of the subject aircraft
- another aircraft landing on the same runway has landed has vacated the runway or
- another aircraft landing on an intersecting runway has crossed or is holding short of the runway.

6.3.4 The rules for landing are that a pilot must only continue an approach past the threshold of the runway when:

- another aircraft departing the same runway has:
 - become airborne and has commenced a turnor
 - passed the point at which the landing aircraft could be expected to complete its landing roll and the landing aircraft is able to safely manoeuvre clear of the aircraft taking off in the event of a missed approach.
- another aircraft landing on the same runway has landed has:
 - vacated the runwayor
 - is taxiing away from the runway.
- another aircraft landing on an intersecting runway has:
 - crossed the runway intersectionor
 - is holding short of the runway intersection.

6.3.5 Pilots should be vigilant when using a runway that is not the preferred runway to ensure that they do not create a hazard to aircraft using the preferred runway.

6.4 Avoiding collision in the traffic circuit

- 6.4.1 The most hazardous area for collisions is within a space bounded by a cylinder of airspace 5NM in diameter and up to 3 000 ft above aerodrome elevation. It is important for all pilots to maintain good situational awareness within this high-risk area.
- 6.4.2 Inbound pilots should minimise distractions within the cockpit. Passengers should be briefed not to distract the pilot unless there is imminent danger.
- 6.4.3 Pilots should be familiar with the aerodrome layout and have radio frequencies set before arrival in the vicinity, 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.
- 6.4.4 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.
- 6.4.5 Good profile and speed control are essential to maintaining adequate spacing during circuit and the approach. If, when on approach, a pilot determines that adequate spacing cannot be maintained and a go-around will be necessary, it should be a go-around should be initiated sooner rather than later.
- 6.4.6 Regulations 91.325, 91.330, 91.335 and 91.340 detail the rules and procedures for establishing right of way and preventing collisions. Pilots should have a sound understanding of these rules if giving way to, approaching head-on to, or overtaking other aircraft.

New Technology: Emergency Auto Land

- 6.4.7 Garmin's emergency auto land (EAL) system is now available for select aircraft. This technology senses if a pilot becomes incapacitated and takes control of the aircraft. Pilots should listen for EAL transmissions, which will provide the aircraft's registration, and its action to land at a named airport. This system does not currently have any see-and-avoid capability. Aircraft in an emergency have right-of-way over all other aircraft. Therefore, if you hear an EAL message, be alert and give way. For more information, refer to the [Garmin Autonomi video](#).

6.5 IFR and VFR aircraft operating simultaneously at, or in the vicinity of, the same non-controlled aerodrome

- 6.5.1 Increased collision risks exist around non-controlled aerodromes if flights are conducted at a time when visibility is reduced, or the cloud base is low but when VMC conditions still exist.
- 6.5.2 In these situations, an increased risk of a pilot flying an instrument approach operation exiting cloud and encountering a VFR aircraft in the circuit exists.
- 6.5.3 Similarly, it is also possible that a pilot conducting an IFR departure from the aerodrome may be climbing out in cloud and suddenly encounter in the vicinity of the aerodrome a VFR aircraft at low level operating clear of cloud.
- 6.5.4 It is expected that VFR pilots, on hearing IFR pilots broadcasting their intention to make an instrument approach or departure, 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. Diligent radio broadcasting and continuous visual scanning are essential to avoid Airprox events.

- 6.5.5 When meteorological conditions are marginal and pilots become aware of an aircraft conducting an instrument approach procedure, the best option might be to land and wait for the pilot to complete the instrument approach procedure.
- 6.5.6 Pilots operating under the VFR should remember their responsibility to remain clear of cloud and maintain in-flight visibility in accordance with the criteria for visual meteorological conditions (VMC).

6.6 Practice instrument approaches

- 6.6.1 Conducting practise instrument approach procedures in VMC adds another piece of complexity for any IFR pilot. In addition to operating the aircraft in the high intensity period of an instrument approach operation, the pilot should also be maintaining a more intensive look out for other traffic.
- 6.6.2 Ideally, a pilot conducting a practise instrument approach operation would have another person with them who is capable of maintaining an effective look out for other traffic in the area.
- 6.6.3 Pilots who wish to conduct practice instrument approaches in VMC should be particularly alert for other aircraft in the circuit to avoid impeding the flow of traffic.
- 6.6.4 Pilots flying IFR should give position reports to be easily understood by VFR pilots, who may have limited knowledge of IFR approach points or procedures. In general, positions should include altitude, distance and direction from the aerodrome. Including 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.
- 6.6.5 When a practise instrument approach operation also includes simulated IMC operations (by the use of a hood or goggles), regulation 91.720 requires a licensed safety pilot to occupy a pilot seat fitted with fully functioning flight controls and to have adequate vision forward and to each side of the aircraft.

6.7 Wake turbulence and windshear

- 6.7.1 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.
- 6.7.2 Wake turbulence tends to sink and move outwards as it dissipates. The turbulence moves outwards at up to 10 kts and, therefore, a crosswind of up to ten knots will result in the wake turbulence staying on the aircraft track as it dissipates.
- 6.7.3 In calm conditions, wake turbulence may not dissipate for up to 3 minutes. On approach, pilots should position their aircraft with sufficient spacing in the traffic circuit to avoid encountering wake turbulence, ideally up to three minutes behind the preceding aircraft and, if practicable, slightly above the profile of the preceding aircraft.
- 6.7.4 Pilots of smaller aircraft departing behind a larger aircraft should note the larger aircraft's rotation point and rotate prior to the larger aircraft's rotation point. The climb performance of many large aircraft is higher than many smaller aircraft so, even after rotating at a point on the runway before the preceding aircraft did, there is a chance of flying through the wake. One option always available to pilots is to wait it out and give the wake time to dissipate.
- 6.7.5 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 aircraft in its vicinity. 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.

- 6.7.6 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 a windshear event should consider an immediate maximum performance climb to fly out of the situation.

7 Standard traffic circuit procedures

7.1 Familiarisation with weather conditions

- 7.1.1 When entering the vicinity of a non-controlled aerodrome, pilots should ensure they familiarise themselves with the weather conditions they can expect. Wind conditions are particularly important because they will affect the runway to be used.
- 7.1.2 There are several ways to determine the wind direction, speed and runway in use:
- contact with one of the following:
 - Aerodrome Weather Information Service.
 - Automatic Aerodrome Information Service.
 - radio contact with an:
 - Aerodrome Flight Information Service.
 - ground-based radio communication service (CA/GRS, UNICOM).
 - company agent.
 - person authorised to provide an authorised weather report
 - aircraft currently operating at the aerodrome.
 - visual indications if the information cannot be determined by one of the above means.
- 7.1.3 Pilots must also assure themselves, by other means, of the aerodrome's serviceability and other hazards which are usually indicated by markings adjacent to the wind indicator.

7.2 Traffic circuit direction

- 7.2.1 The standard aerodrome traffic circuit facilitates the orderly flow. Unless an alternative requirement for an aerodrome is stated in the ERSA or NOTAMs, all turns must be made to the left (regulation 91.385).
- 7.2.2 When arriving at an aerodrome to land, the pilot will normally join the circuit on upwind, crosswind (midfield), or at or before mid-downwind. Landings and take-offs should be made on the preferred runway .
- 7.2.3 If a secondary runway is being used (e.g. for crosswind or low-level circuits), pilots using the secondary runway should not impede the flow of traffic using the preferred runway.
- 7.2.4 Aerodromes that have right-hand circuits are listed in the ERSA.

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.

7.3 Circuit heights

- 7.3.1 By convention, aircraft should fly the standard traffic circuit at the heights shown in Figure 2.

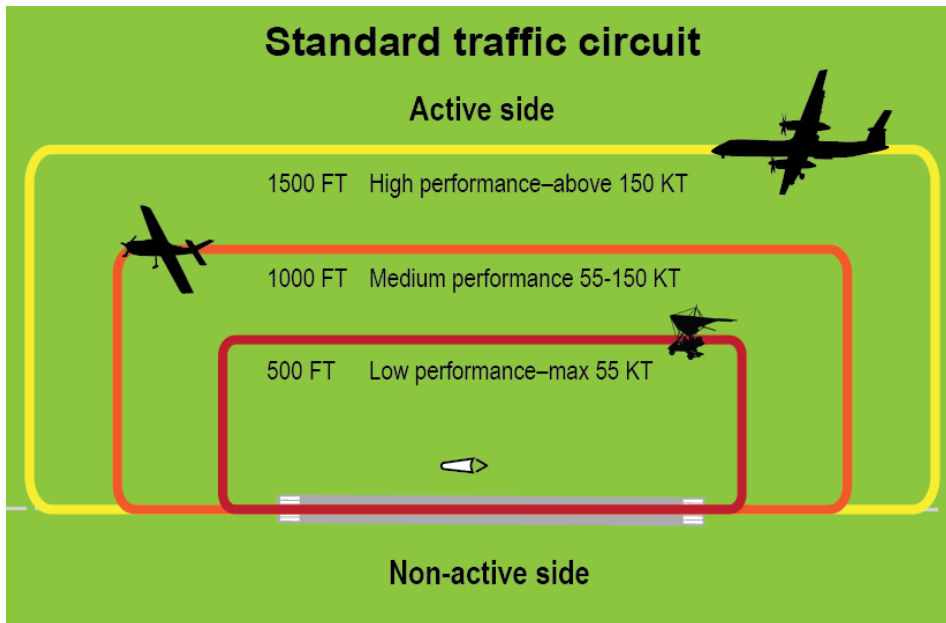


Figure 2: Standard circuit heights

7.3.2 During initial climb-out, the turn onto crosswind should be 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 (regulation 91.390). Pilots may vary the size of the circuit depending on:

- the performance of the aircraft
- AFM/Pilot's Operating Handbook requirements
- company standard operating procedures
- other safety reasons.

7.4 Arrival procedures

7.4.1 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, the overfly procedure should be used. Pilots should consider the location of the windsock when determining how to conduct the overflight of the aerodrome. The pilot should overfly or circle the aerodrome at least 500 ft above the circuit height, usually 2 000 ft or more above aerodrome elevation. When the circuit direction has been determined, the pilot should position the aircraft to a point well clear of the circuit (normally the non-active side of the circuit) before descending to the circuit height applicable to the aircraft's performance (refer to Figure 3).

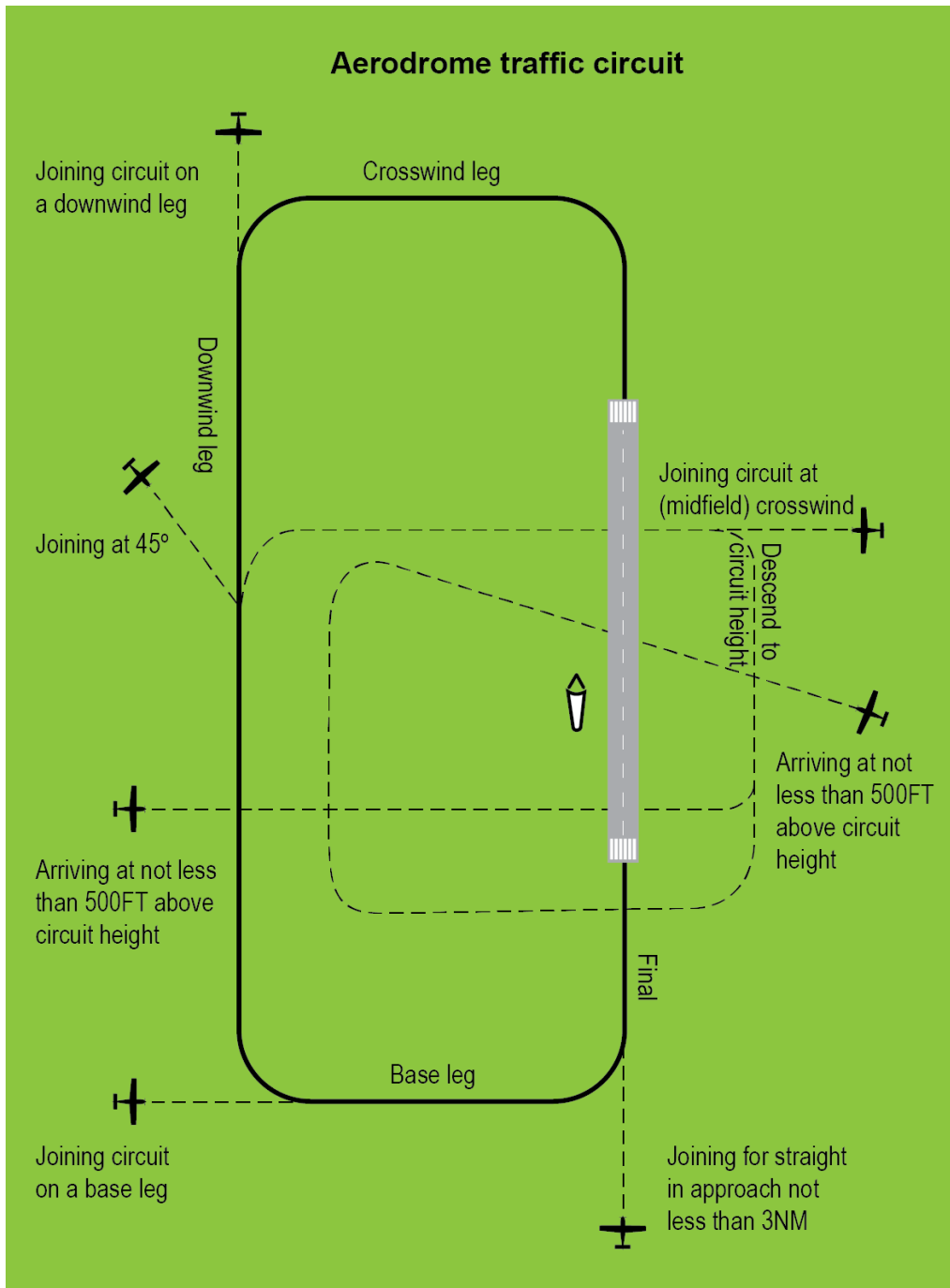


Figure 3: Aerodrome standard traffic circuit, showing arrival and joining procedures

CAUTION

Pilots should 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 (refer to Appendix 1 for a more detailed diagram of the traffic circuit and overfly procedure).

- 7.4.2 For low-performance ultralight aircraft and rotorcraft with a typical circuit speed of approximately 55 kt, it is recommended that the pilot overfly midfield at 500 ft above aerodrome elevation. This will minimise the risk of conflict with higher or faster traffic (also refer to sections 5.4 and 5.5).
- 7.4.3 Pilots arriving overhead of the active side of the circuit, or overflying the active side before turning back to the non-active side (to do something like check the windsock) should delay descent until on the non-active side of the circuit. They should then aim to be established at circuit height by the time they turn to join a mid-field cross wind leg.
- 7.4.4 Aircraft joining on the downwind leg at a midfield position should enter the circuit at approximately 45 degrees to the downwind leg and give way to aircraft already established in the circuit.
- 7.4.5 On the downwind leg, the applicable circuit height should be maintained until commencement of the base leg turn unless this would lead to an unstable approach due to aircraft performance requirements. The base leg turning position is normally where the aircraft is approximately 45 degrees from the runway threshold. Along the base leg, pilots must continue their lookout, particularly for aircraft on or joining final, and maintain traffic separation.
- 7.4.6 When on the final leg, pilots should confirm that the runway is, and remains, clear for landing.

7.5 Maximum speed

- 7.5.1 It is recommended that aircraft not be flown in the circuit above 200 kt IAS.

7.6 Overtaking in the circuit

- 7.6.1 While the intent is to follow any preceding aircraft in a standard traffic pattern, there are occasions when a faster aircraft may need to overtake a slower aircraft.
- 7.6.2 While overtaking is not preferred, it can be accomplished safely by combinations of increased speed and/or varying circuit size.
- 7.6.3 Typically, overtaking can be achieved with mutual agreement from the slower aircraft to extend a circuit leg (typically the downwind leg) and the faster aircraft shortens their flight on the same leg of the circuit. This is referred to as 'turning inside' the preceding aircraft and should only be done with the mutual agreement of the aircraft being overtaken.
- 7.6.4 Pilots are reminded that they have a continual responsibility to operate safely and not cause a hazard for other aircraft (regulations 91.055 and 91.215). Additionally, an overtaking aircraft's pilot has a responsibility to give way to the aircraft being overtaken (regulation 91.330).

7.7 Joining on base leg

- 7.7.1 Pilots should be mindful that the following kinds 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 late final due to other aircraft or vehicles on the runway
 - landing on a closed runway or at a closed aerodrome.
- 7.7.2 Joining on the base leg is not a standard procedure. CASA recommends that pilots join the circuit on either the crosswind (midfield) or downwind leg. However, pilots who choose to join on base leg should only do so if they have familiarised themselves with the weather conditions to be expected and aerodrome serviceability.
- 7.7.3 Pilots should broadcast their intentions and give way to other circuit traffic and ensure the aircraft can safely (i.e., no traffic conflict likely) join the base leg applicable to the circuit direction in use at the standard height.

- 7.7.4 If any uncertainty exists, the pilot should consider joining the circuit using another standard arrival procedure.
- 7.7.5 Although aircraft flying at different speeds will generally be separated by both circuit height and horizontal displacement, pilots joining on base should take extra care not to descend into traffic at lower altitudes, particularly as they approach final. This can occur if parts of the descending aircraft mask the pilot's view of the flight path below their aircraft.

7.8 Final approach

- 7.8.1 The turn onto final approach should be:
- completed by a distance and height that is common to all operations at the aerodrome
 - commensurate with the speed flown in the circuit for all aircraft of the same type.
- 7.8.2 Except for IFR circling operations, the turn onto final approach should be completed at least 500 ft above aerodrome elevation. This should allow sufficient time for the pilot to ensure that the runway is clear for landing. It will also allow sufficient time for the majority of aircraft to fly a stabilised approach and landing.

7.9 Straight-in approaches

- 7.9.1 Pilots who choose to adopt a straight-in approach should only do so when it does not disrupt or conflict with the flow of circuit traffic. Regulation 91.395 requires a pilot conducting a straight-in approach to give way to any other aircraft flying in the circuit pattern. Nonetheless, pilots conforming to the circuit pattern, particularly on the base leg, should continue to check for traffic entering along the final approach path.
- 7.9.2 When conducting a straight-in approach, the aircraft must be established on final approach at not less than 3 NM from the landing runway threshold (regulation 91.395).
- 7.9.3 Pilots should announce their intention to conduct a straight-in approach with their inbound broadcast. A further broadcast of intentions should also be made when not less than 3 NM from the runway threshold.
- 7.9.4 In addition, pilots conducting a straight-in approach should observe the following:
- pilots should not commence a straight-in approach to a runway when the reciprocal runway is being used by aircraft already established in the circuit.
 - only minor corrections to speed and flight path, to maintain a stable approach, should be required within 3 NM on final. The aircraft's transponder should be selected to ON/ALT (Mode C). The aircraft's external lights (where fitted) should be illuminated and remain on until the aircraft has landed and is clear of all runways.
 - 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.

7.10 Go-arounds

- 7.10.1 A pilot who elects to abort a landing should manoeuvre to keep other traffic in sight, maintain a safe distance from other aircraft and re-join the circuit when it is safe to do so. Once immediate actions, such as reconfiguring the aircraft are completed, a pilot should, where possible, manoeuvre to the non-active side of the runway (refer to Figure 4). This may involve manoeuvring to the right, left or maintaining the runway centreline, depending on traffic, the circuit direction and terrain. Pilots of IFR aircraft must also adhere to any missed approach procedures and circling restrictions at the aerodrome.

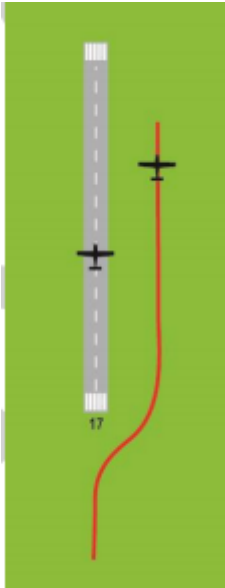


Figure 4: Go-around from runway with left-hand circuits

- 7.10.2 Extra care should be taken operating at an aerodrome with multiple parallel runways. Manoeuvring to the non-active side might not be possible as shown in Figure 5. Pilots should ensure they communicate effectively and be prepared to modify normal procedures if the circumstances require it.

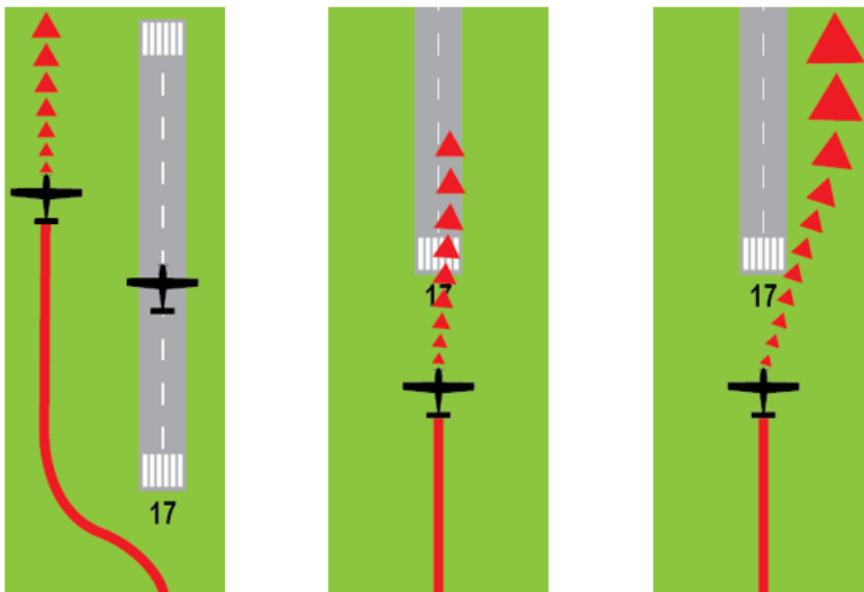


Figure 5: Go-around at an aerodrome with multiple parallel runways

- 7.10.3 A turn onto crosswind can be executed when well clear of the over-taken aircraft, and when preceding aircraft upwind or early downwind are clear. If necessary, a pilot should extend the upwind leg until the turn onto crosswind can be safely conducted.

7.11 Departing the circuit area

- 7.11.1 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 should be 500 ft or more above the circuit height and 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 the circuit area.

CAUTION

Be aware of traffic joining the circuit by the recommended overfly procedure, especially if climbing to depart overhead the aerodrome.

7.12 Transiting and overflying en-route

- 7.12.1 Pilots who prefer to track via non-controlled aerodromes for risk mitigation or other purposes should avoid overflying the aerodrome at an altitude that could conflict with operations in the vicinity of the aerodrome. However, pilots should be conscious that IFR approach procedures may commence at significant heights above the aerodrome.
- 7.12.2 It should not be assumed that overflying an aerodrome en-route relieves a pilot from the need to make suitable broadcasts.

7.13 Night circuits

- 7.13.1 Night circuit operations require increased pilot vigilance as they are generally more demanding than day circuit operations.
- night circuits for training purposes should be conducted at a height not less than 1 000 ft above aerodrome elevation. [AC 61-05](#) includes further guidance applicable to night circuit operations
 - pilots flying Night VFR should refer to [AC 61-05](#)
 - pilots flying IFR should consult AIP-ENR 1.5 for guidance on conducting a non-precision approach and visual circling manoeuvres.

8 Radio calls and usage (reports and broadcasts)

8.1 Fundamentals of correct radio calls

- 8.1.1 Pilots need to take extra care to monitor and broadcast on the correct CTAF, as there continues to be reported incidents in which a pilot claims to have made the appropriate broadcasts but have not been heard by other aircraft.
- 8.1.2 It is fundamental to the concept of effective radio communications that all affected persons can understand and comprehend the information being delivered by the radio transmission. Pilots should speak at a normal pace, as rapid speech can make transmissions difficult to understand.
- 8.1.3 A critical factor in ensuring comprehension is the use of standard aviation phraseology. Radio calls are recommended to be brief and clear, balanced with the imperative to convey the information necessary for other aircraft and, if relevant, the air traffic service.
- 8.1.4 To ensure clarity and to reduce workload, pilots should consider practising the broadcast before making it.
- 8.1.5 Pilots should be careful not to 'clip' the transmission when broadcasting their location, as confusion can arise at aerodromes that are close together and sharing the same CTAF. Delaying slightly after pushing the transmit button will ensure the transmission is not clipped.
- 8.1.6 Ideally, pilots should make circuit broadcasts prior to making a turn because banking aircraft are easier to see. A simple strategy to remember when flying in the circuit is 'Look, Talk and Turn'.
- 8.1.7 The following guidance is specific to aerodromes with an Aerodrome Frequency Response Unit (AFRU) in operation:
- be careful not to momentarily break transmission as the AFRU will automatically over-transmit any subsequent broadcast
 - pilots will receive confirmation that they are broadcasting on the relevant CTAF (this will be either the name of the aerodrome and the word "CTAF" or, if any aircraft transmissions have been received by the AFRU within the last five minutes, a low volume 300 millisecond tone burst). This helps pilots to both confirm they are using the right frequency and makes them aware of potential traffic in the area.
- 8.1.8 Pilots should be aware that a variety of radio call signs are used across the aviation industry. Some examples are:
- passenger transport (e.g. 'Q-link 2719')
 - recreational (e.g. 'Jabiru 5234')
 - military (e.g. 'Stallion 22')
 - law enforcement (e.g. 'Polair 5')
 - foreign-registered (e.g. 'November 1-5 Yankee')
 - VH-ZFR (e.g. 'Zulu Foxtrot Romeo').

8.2 Radio calls and collision avoidance

- 8.2.1 Pilots are reminded that although **correct and informative** radio calls play a critical role in ensuring collision avoidance in uncontrolled airspace, to ensure the safety of their aircraft they **cannot assume** that an absence of other radio calls means there are no nearby or conflicting aircraft.

- 8.2.2 Pilots must continually look out for other aircraft, even when their broadcasts have generated no response.
- 8.2.3 Accidents and incidents have occurred where pilots incorrectly assessed the threat posed by another aircraft, either due to the pilot incorrectly assessing the relative aircraft flight paths, or inaccurate information being provided by other pilots.
- 8.2.4 It is essential to aviation safety that radio calls contain information regarding aircraft current position, altitude and tracking, and where necessary future altitude and tracking, that is accurate and meaningful to other aircraft.

Example - departure radio call

When making the departure radio call at an uncontrolled aerodrome, to ensure accurate information is available and clear to other pilots, the radio call needs to differentiate whether the aircraft is already established on the outbound track, or is being manoeuvred to intercept the outbound track.

Without the tracking of the aircraft being accurately conveyed in the radio call, other pilots can incorrectly assess that the departing aircraft poses no threat, thereby influencing their decision whether to start communicating to ensure self-separation.

- 8.2.5 It is essential that, once contact with another aircraft is established, pilots ensure that they and the other aircraft adhere to mutually agreed flight paths to maintain adequate spacing.
- 8.2.6 It is strongly recommended that:
- pilots avoid using local terminology in position reports; for example, use 'Bundaberg' instead of 'Bundy'
 - a broadcast includes the:
 - name of the aerodrome
 - aircraft's type and call sign
 - position of the aircraft and the pilot's intentions.
- 8.2.7 AC 91-14 *Pilots' responsibility for collision avoidance* contains further information on collision avoidance techniques.

8.3 Radio frequency to use for broadcasts

- 8.3.1 When departing or arriving at non-controlled aerodromes, pilots should use the one of the following frequencies:
- when in the vicinity of an aerodrome published on aeronautical charts, listen and broadcast as necessary on the CTAF (126.7 MHz or other published discrete frequency)
 - when aerodromes are located within a Mandatory Broadcast Area, listen and broadcast as necessary on the frequency for the Mandatory Broadcast Area
 - in all other cases, it is recommended to listen and broadcast as necessary on the Area VHF.
- 8.3.2 The underlying safety intent is that broadcasts are made on a frequency that other aircraft in the vicinity will be monitoring.
- 8.3.3 There are additional risks associated with operations at aerodromes or ALAs that are not published on an aeronautical chart.
- 8.3.4 Under limited circumstances, such as multiple aircraft using the same uncharted ALA outside a CTAF or Mandatory Broadcast Area, it may be appropriate for the pilots involved to monitor and broadcast on a frequency other than Area VHF (such as the CTAF or 126.7 MHz). However, pilots undertaking these operations should be aware that overflying traffic will be on Area VHF

and are likely to be unaware of the uncharted aerodrome/ALA. Hence, the safety benefits of 'alerted' 'see-and-avoid' may not be achieved. It is recommended that pilots at uncharted aerodromes using a frequency other than Area VHF also monitor Area VHF.

- 8.3.5 Pilots should study all authorised aeronautical charts relevant to their flight route and category. This is because some details may be omitted from charts of different scales even though they cover the same area (usually to avoid clutter).²

8.4 Radio frequency congestion advice

- 8.4.1 Pilots and operators who regularly experience radio traffic congestion at aerodromes that are not assigned a discrete frequency should contact the local Aviation State Engagement Forum (AvSEF) to submit a request to change or assign a discrete CTAF to help improve safety. Details of the local AvSEF can be found on the [website www.avsef.gov.au](http://www.avsef.gov.au).

8.5 Mandatory broadcasts

- 8.5.1 Regulation 91.630 and Chapter 21 of the Part 91 MOS specify the mandatory situations that require a radio broadcast or report to be made. Regulation 91.055, which contains a broad rule requiring pilots to avoid creating hazards, might also necessitate pilots making a broadcast or report even in a situation not specifically mentioned in regulation 91.630 or Chapter 21 of the Part 91 MOS.
- 8.5.2 For non-controlled aerodromes not located in a Mandatory Broadcast Area, the pilot is required to make a broadcast whenever it is reasonably necessary to do so to avoid a collision, or the risk of a collision, with another aircraft. Pilots who intentionally avoid broadcasting – for whatever reason – must keep in mind that such action may increase the risk of a collision, with the potential for serious consequences.

Note: There have been a number of incidences of ostensible radio unserviceability where subsequent analysis of the aircraft's radio systems found no fault with the equipment.

- 8.5.3 Certain volumes of Class G airspace are legally designated as Mandatory Broadcast Areas. Special rules for these areas are contained in Chapter 11 of the Part 91 MOS and the required radio broadcasts and reports for Mandatory Broadcast Areas are contained in Chapter 21 of the Part 91 MOS. The horizontal and vertical boundaries of Mandatory Broadcast Areas are defined in the Designated Airspace Handbook (DAH) and on aeronautical charts. The vertical boundary of a Mandatory Broadcast Area can be one of the following:
- surface to 5 000 ft above mean sea level
 - surface to the base of controlled airspace if 8 500 ft or less
 - surface to a designated level.
- 8.5.4 There is usually more than one aerodrome within a Mandatory Broadcast Area, and pilots operating within the area must be monitoring the published CTAF for the Mandatory Broadcast Area and make the required broadcasts and reports.
- 8.5.5 Table 8 contains the mandatory reports by IFR aircraft in Class G airspace, and for VFR aircraft in Classes E and G airspace. The specific phraseology for each of these radio calls is contained in a table in AIP GEN 3.4.

² Chart errors and omissions should be notified to Airservices Australia <https://www.airservicesaustralia.com/industry-info/aeronautical-information-management/>

- 8.5.6 Pilots are strongly recommended to pay particular attention to making accurate departure radio calls at non-controlled aerodromes. See item 2 of Table 8 below for more information.
- 8.5.7 Table 9 contains the mandatory broadcasts and reports by all aircraft flying within a Mandatory Broadcast Area.

Note: These requirements are from sections 21.06 and 21.07 of the Part 91 MOS.

Table 8: Mandatory reports by IFR in Class G airspace and VFR aircraft in Classes E and G airspace

Item	Situation	Report
IFR aircraft (Class G) Part 91 MOS Table 21.06(1)		
1	Taxiing. Note: An exception from establishing positive contact with ATS applies where the operator of a flight is an AOC holder, aerial work certificate holder or Part 141 certificate holder - see section 21.06 of the Part 91 MOS.	Report the situation.
2	Departure Note: An exception from establishing positive contact with ATS applies where the operator of a flight is an AOC holder, aerial work certificate holder or Part 141 certificate holder - see section 21.06 of the Part 91 MOS.	Report the situation. Notes: <ol style="list-style-type: none"> 1. This radio call is particularly critical to ensuring safe separation between aircraft in the vicinity of the aerodrome. 2. This radio call provides essential information regarding the current location of the departing aircraft and, where applicable, its immediate future intentions regarding tracking and altitude. 3. Pilots of departing aircraft should ensure they accurately describe whether they are already established on a specific outbound track outbound from the aerodrome navigation aid or reference point, or they are still manoeuvring to intercept an outbound track.
3	Reaching cruising level.	Report the situation.
4	Position report when required by the ATC service or by the route reporting requirements of the authorised aeronautical information.	Report the situation.
5	Previously reported position estimate is more than 2 minutes in error. Note: An exception applies in relation to the use of ADS-C - see section 21.06 of the Part 91 MOS.	Report the situation.
6	Before changing level.	Report the situation.

Item	Situation	Report
7	Before changing frequency.	Report the situation.
8	Requiring clearance into controlled airspace.	Report the situation.
9	Before changing to CTAF and not monitoring ATS frequency on second COM system.	Report the situation.
10	After landing.	Report the situation.
VFR aircraft (Class E or G) Part 91 MOS Table 21.07(1)		
1	Requiring clearance into controlled airspace.	Report the situation.
2	Before, and on completion of, over-water stage.	Report in accordance with SAR reporting schedules if arranged before the over-water stage.

Note: These requirements are from section 21.09 of the Part 91 MOS.

Table 9: Mandatory broadcasts and reports by all aircraft in Mandatory Broadcast Areas

Item	Situation	Report
All aircraft Part 91 MOS Table 21.09(1)		
1	Before or immediately after entering an MBA.	Broadcast the pilot's intended use of the MBA.
2	Joining a circuit.	Broadcast the situation, and indicate the leg on which the aircraft will join.
3	Conducting a straight-in approach.	No later than 3 NM from the runway threshold — broadcast the situation.
4	Passing the final approach fix of an instrument approach procedure.	Broadcast the situation.
5	Commencing a missed approach.	Broadcast the situation.
6	After landing and clear of the active runway(s). Note: 'Active runway' in this MOS requirement is referring to any runway at the aerodrome in use during the ground movement of the aircraft after landing. As MBA aerodromes require specific radio calls to be made, all pilots in command, to maintain compliance with regulation 91.055 of CASR, need to maintain situational	Broadcast the situation.

Item	Situation	Report
	awareness of other traffic at the aerodrome until the aircraft movement has ceased at the end of the flight.	
7	Starting to taxi.	<p>Broadcast the situation, and the following information:</p> <ol style="list-style-type: none"> that the flight is to be conducted under the IFR, if that is the case for any flight, either: <ol style="list-style-type: none"> the planned destination aerodrome for the flight or the direction in which the pilot intends to fly from the aerodrome or the nature of operation (e.g. circuits) the runway proposed to be used for takeoff.
8	Immediately before entering the runway to be used for take-off.	<p>Broadcast the following:</p> <ol style="list-style-type: none"> a statement that the aircraft is entering the runway; the runway identifier.

8.6 Recommended broadcasts in the vicinity of a non-controlled aerodrome

- 8.6.1 Whenever pilots determine that there is a potential for traffic conflict, they should make radio broadcasts as necessary to avoid the risk of a collision or an Airprox event. Pilots should not be hesitant to call and clarify another aircraft's position and intentions if there is any uncertainty.
- 8.6.2 It is essential that pilots maintain a diligent lookout because other traffic may not be able to communicate by radio. For example, the other pilot may be tuned to the wrong frequency, selected the wrong radio, have a microphone failure, or have the volume turned down.
- 8.6.3 The recommended broadcast format for low and medium performance aircraft is:
- location Traffic (e.g. 'Parkes Traffic')
 - aircraft Type (e.g. 'Cessna 172')
 - call sign (e.g. 'Zulu Foxtrot Romeo')
 - flight rules if IFR
 - position/Level/Intentions (e.g. 'One-zero miles north passing four thousand two hundred, on decent, inbound, circuit three-six')
 - location (e.g. Parkes).
- 8.6.4 In addition to making their own broadcasts, pilots should listen to broadcasts by other aircraft, an air traffic service or a CA/GRS to increase situational awareness. This 'alerted' see-and-avoid strategy results in an eight-fold increase in the likelihood of seeing another aircraft.

- 8.6.5 Table 10 sets out the recommended broadcasts for all pilots operating in the vicinity of a non-controlled aerodrome, but pilots may use discretion in determining the number and type of broadcasts they make.

Example - number of broadcasts

When operating from a private or remote airstrip, a single broadcast declaring an intention to take-off and track in particular direction may be all that is required where there is no response to the initial transmission.

- 8.6.6 Pilots are reminded they are required to make all broadcasts necessary to avoid the risk of a collision with another aircraft as prescribed by Section 21.04 of the Part 91 MOS. Table 10 below contains the recommended broadcasts to achieve this requirement. In addition to meeting this requirement, IFR pilots are reminded that they must make the standard radio reports that apply to operations in Class G airspace as shown in Table 8 above which are prescribed by Chapter 21 of the Part 91 MOS.

Table 10: Recommended broadcasts in the vicinity of a non-controlled aerodrome

Item	Situation	Broadcast
Recommended calls in all circumstances		
1	The pilot intends to take-off.	Immediately before, or during taxiing.
2	The pilot is inbound to an aerodrome.	10 NM from the aerodrome, or earlier, commensurate with aeroplane performance and pilot workload, with an estimated time of arrival (ETA) for the aerodrome.
3	The pilot intends to fly through the vicinity of, but not land at, a non-controlled aerodrome.	10 NM from the aerodrome, or earlier, commensurate with aeroplane performance and pilot workload, with an estimated time of arrival.
Recommended calls dependent on traffic		
4	The pilot intends to enter a runway.	Immediately before entering a runway.
5	The pilot is ready to join the circuit.	Immediately before joining the circuit.
6	The pilot intends to make a straight-in approach.	On final approach at not less than 3 NM from the threshold. (See Note)
7	The pilot intends to join on base leg.	Prior to joining on base.
8	During an Instrument Approach when: <ul style="list-style-type: none"> a. departing FAF or established on final approach segment inbound b. terminating the approach, commencing the missed approach. 	Including details of position and intentions that are clear to all pilots (both IFR and VFR).
9	The aircraft is clear of a runway strip.	Once established outside the runway strip.

Note: Some distances above refer to the runway threshold and others to the aerodrome reference point. Pilots should be aware that a global positioning system (GPS) indication of 3 NM from an aerodrome may not be 3 NM from the runway threshold.