



## Civil Aviation Advisory Publication

Revised August 2012

CAAPs provide guidance, interpretation and explanation on complying with the Civil Aviation Regulations (CAR) or Civil Aviation Orders (CAO).

This CAAP provides advisory information to the aviation industry in support of a particular CAR or CAO. Ordinarily, the CAAP will provide additional 'how to' information not found in the source CAR, or elsewhere.

A CAAP is not intended to clarify the intent of a CAR, which must be clear from a reading of the regulation itself, nor may the CAAP contain mandatory requirements not contained in legislation.

**Note:** Read this advisory publication in conjunction with the appropriate regulations/orders.

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# Operations in the vicinity of non-towered (non-controlled) aerodromes

## The relevant regulations and other references

- Civil Aviation Regulation (CAR 1988) 92 — *Use of aerodromes*
- Civil Aviation Regulations (CAR 1988) 99A — *Broadcasts to be made at certain aerodromes*
- Civil Aviation Regulation (CAR 1988) 120 — *Weather reports not to be used if not made with authority*
- Civil Aviation Regulation (CAR 1988) 138 — *Pilots to comply with requirements etc of aircraft's flight manual etc*
- Civil Aviation Regulation (CAR 1988) 161 — *Right of way*
- Civil Aviation Regulation (CAR 1988) 162 — *Rules for prevention of collision*
- Civil Aviation Regulation (CAR 1988) 163 — *Operating near other aircraft*
- Civil Aviation Regulation (CAR 1988) 166 — *Definitions for Subdivision 2*
- Civil Aviation Regulation (CAR 1988) 166A — *General requirements for aircraft on the manoeuvring area or in the vicinity of a non-controlled aerodrome*
- Civil Aviation Regulation (CAR 1988) 166B — *Carrying out a straight-in approach*
- Civil Aviation Regulation (CAR 1988) 166C — *Responsibility for broadcasting on VHF radio*
- Civil Aviation Regulation (CAR 1988) 166D — *Designation of non-controlled aerodromes*
- Civil Aviation Regulation (CAR 1988) 166E — *Requirements for operating on or in the vicinity of certified, military, registered or designated non-controlled aerodromes*
- Civil Aviation Regulation (CAR 1988) 167 — *General requirements for aerodrome traffic at controlled aerodromes*
- Civil Aviation Regulation (CAR 1988) 243 — *Listening watch*
- Civil Aviation Order (CAO) 29.2 — *Air service operations – night flying training*
- Civil Aviation Order (CAO) 95.4 — *Exemption from provisions of the Civil Aviation Regulations 1988 – gliders, powered sailplanes and power-assisted sailplanes*
- Civil Aviation Safety Regulation (CASR 1998) 137.155 — *Operations near RPT flight*

## The relevant regulations and other references (continued)

- Civil Aviation Safety Regulation (CASR 1998) 137.160 — *Aerodrome circuit requirements*
- Civil Aviation Safety Regulation (CASR 1998) subpart 139.B — *Certified aerodromes*
- Civil Aviation Safety Regulation (CASR 1998) subpart 139.C — *Registered aerodromes*
- AIP GEN 3.5, section 6 — *Hazardous Weather*
- AIP GEN 2.2, section 1 — *Definitions*
- AIP ENR 1.1, paragraph 57.2 — *Separation Minima*
- AIP ENR 1.2, paragraph 1.1 — *The Visual Flight Rules (VFR)*
- AIP ENR 1.5, paragraph 1.7 — *Visual Circling or During Non-Precision Approach (NPA)*
- ICAO Annex 2 *Rules of the Air*, Chapter 1 — *Definitions*
- CASA Day (VFR) syllabi for aeroplanes, helicopters and balloons
- CASA Flight Radiotelephone Operator Licence (FROL) syllabus of training
- CASA Aircraft Radiotelephone Operator Certificate of Proficiency (AROC) syllabus of training
- Minister's Australian Airspace Policy Statements 2007 and 2010
- Civil Aviation Advisory Publication (CAAP) 5.13-2(0) — *Night Visual Flight Rules Rating*
- Civil Aviation Advisory Publication (CAAP) 166-2(0) — *Pilots' responsibility for collision avoidance in the vicinity of non-towered (non-controlled) aerodromes using 'see and avoid'*

## To whom this CAAP applies

This CAAP applies to all student, private, commercial, air transport, sport and recreational pilots who operate at, or in the vicinity of, non-towered aerodromes. This includes gliders, ultralights, balloons, and gyroplanes flown on pilot certificates issued by the ABF, ASRA, HGFA, GFA, and RA-Aus.

## Why this publication was written

CASA is committed to carrying out the Australian Government's National Airspace System (NAS) Reform objectives in accordance with the Australian Airspace Policy Statement 2010. NAS involves a number of characteristics to be implemented over several years.

The purpose of this CAAP is to support NAS Characteristic no. 29 *Common Traffic Advisory Frequency Procedures*. The CAAP provides guidance on a code of conduct (good airmanship) to allow greater flexibility for pilots when flying at, or in the vicinity of, non-towered aerodromes.

This CAAP also supports CAAP 166-2(0).

## Status of this CAAP

This is the first amendment of this CAAP and replaces CAAP 166-1(0) issued in June 2010. It has been amended to coincide with consequential amendments made to the Aeronautical Information Package (AIP) relating to the introduction of the 'broadcast areas' which are depicted in the AIP MAP. It is essential that these changes are also incorporated in this CAAP as it is a requirement for pilots to make a broadcast when 'in the vicinity' of any aerodrome whilst they are operating in a broadcast area (See CAR 166C).

## 1. Acronyms

<b>AAIS</b>	Automatic Aerodrome Information Service
<b>ABF</b>	Australian Ballooning Federation Inc.
<b>ACAS</b>	Airborne Collision Avoidance System
<b>AFM</b>	Aircraft Flight Manual
<b>AFRU</b>	Aerodrome Frequency Response Unit
<b>AGL</b>	Above Ground Level
<b>AIP</b>	Aeronautical Information Publication
<b>AIP ENR</b>	<b>AIP</b> — En Route
<b>AIP GEN</b>	<b>AIP</b> — General
<b>airprox</b>	aircraft proximity
<b>ALT</b>	Altitude
<b>AOC</b>	Air Operator's Certificate
<b>AROCP</b>	Aircraft Radiotelephone Operator Certificate of Proficiency
<b>ARP</b>	Aerodrome Reference Point
<b>ASRA</b>	Australian Sport Rotorcraft Association Inc.
<b>ATC</b>	Air Traffic Control
<b>ATS</b>	Air Traffic Services
<b>AWS</b>	Automatic Weather Station
<b>AWIS</b>	Aerodrome Weather Information Service
<b>CA/GRS</b>	Certified Air/Ground Radio Service
<b>CAAP</b>	Civil Aviation Advisory Publication
<b>CAO</b>	Civil Aviation Order
<b>CAR</b>	1988 Civil Aviation Regulation
<b>CASA</b>	Civil Aviation Safety Authority
<b>CASR</b>	1998 Civil Aviation Safety Regulation

<b>CERT</b>	Certified aerodrome [ERSA]
<b>CTAF</b>	Common Traffic Advisory Frequency
<b>ERSA</b>	En Route Supplement Australia
<b>ETA</b>	Estimated Time of Arrival
<b>FROL</b>	Flight Radiotelephone Operator Licence
<b>FT</b>	Feet
<b>GA</b>	General Aviation
<b>GFA</b>	Gliding Federation of Australia Inc.
<b>GPS</b>	Global Positioning System
<b>HGFA</b>	Hang Gliding Federation of Australia Inc.
<b>IAS</b>	Indicated Airspeed
<b>ICAO</b>	International Civil Aviation Organization
<b>IFR</b>	Instrument Flight Rules
<b>KG</b>	Kilograms
<b>KT</b>	Knot
<b>MIL</b>	Military aerodrome [ERSA]
<b>MTOW</b>	Maximum Take-Off Weight
<b>NAS</b>	National Airspace System
<b>NM</b>	Nautical Mile
<b>NOTAM</b>	Notice to Airmen
<b>NPA</b>	Non-Precision Approach
<b>NVFR</b>	Night Visual Flight Rules
<b>POH</b>	Pilot's Operating Handbook (see also AFM)
<b>RA-Aus</b>	Recreational Aviation Australia Inc.
<b>RAAF</b>	Royal Australian Air Force
<b>REG</b>	Registered aerodrome [ERSA]
<b>RNAV</b>	Area Navigation
<b>RPT</b>	Regular Public Transport
<b>SOP</b>	Standard Operating Procedure
<b>TCAS</b>	Traffic Collision Avoidance System (see ACAS)
<b>UNCR</b>	Uncertified and unregistered aerodrome [ERSA]
<b>UNICOM</b>	Universal Communications
<b>VFG</b>	Visual Flight Guide [CASA]
<b>VFR</b>	Visual Flight Rules

**VHF** Very High Frequency  
**VMC** Visual Meteorological Conditions

## 2. Definitions

**Active runway:** Preferably the runway most closely aligned into the prevailing wind. In nil wind, or when predominantly all crosswind, it is the runway in use.

**Aerodrome elevation [AIP GEN 2.2]:** The elevation of the highest point of the landing area.

**Aerodrome traffic [ICAO Annex 2 to the Convention on International Civil Aviation, Chapter 1 — Definitions]:** All traffic on the manoeuvring area of an aerodrome and all traffic in the vicinity of an aerodrome.

**Aerodrome traffic circuit [AIP GEN 2.2]:** The specified path to be flown by aircraft flying in, entering, or leaving the traffic circuit.

**Airmanship [ICAO Annex 1 to the Convention on International Civil Aviation, Section 1.1 — Definitions]:** The consistent use of good judgement and well-developed knowledge, skills and attitudes to accompany flight objectives.

**Airprox [ICAO Document 4444, Chapter 1 — Definitions]:** 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.

**Broadcast areas [AIP GEN 3.2]** Broadcast areas are defined airspace volumes in G airspace for which a discrete frequency (CTAF) has been allocated. All operations, including those at aerodromes (chartered and uncharted) and landing sites within this area shall use this CTAF as the broadcast frequency. A note on charts states “for operations in this area SFC- (altitudes) use CTAF (frequency)”

**CA/GRS [AIP GEN 3.4]:** An aerodrome-based radio information service, which may operate at non-towered aerodromes. The service is a safety enhancement facility which provides pilots with operational information relevant to the particular aerodrome. The service is operated by or for the aerodrome operator to published hours, on the CTAF assigned to the particular aerodrome. It is not an Airservices or RAAF-provided air traffic service.

**Certified aerodrome:** An aerodrome certified by CASA under CASR subpart 139.B. A certified aerodrome has a runway suitable for aircraft with more than 30 passenger seats or able to carry 3400 kg and is available for RPT or charter operations by such aircraft. It has higher operating standards than a registered aerodrome. (See also *Registered aerodrome*.)

**Class G airspace [AIP ENR 1.4]:** Non-controlled airspace. Note: In Class G airspace, IFR and VFR flights are permitted. IFR flights receive traffic information and flight information service. VFR flights receive a flight information service if requested.

**Code of conduct:** A set of conventional principles and expectations that are considered binding on any person who is a member of a particular group.

**Designated aerodrome [CAR 166D]:** In addition to requiring the carriage of radio at certified, registered and military aerodromes, CASA may issue an instrument that states that a specified non-controlled aerodrome is a designated aerodrome. When operating in the vicinity of a designated aerodrome the carriage of radio is required. CASA will identify and publish designated aerodromes in the AIP (ERSA) and/or NOTAMs.

**In the vicinity [CAR 166]:** An aircraft is in the vicinity of a non-towered aerodrome if it is within:

- airspace other than controlled airspace;
- a horizontal distance of 10 miles from the aerodrome (reference point); and
- a height above the aerodrome (reference point) that could result in conflict with operations at the aerodrome.

**Military aerodrome [CAR 2(1)]:** An aerodrome under the control of any part of the Defence Force. Note: Criteria for military aerodrome operations are published in ERSA. The carriage of radio is required at military aerodromes at all times.

**Non-towered aerodrome:** An aerodrome at which air traffic control is not operating. This can be either:

- An aerodrome that is always in Class G airspace;
- An aerodrome with a control tower where no ATC service is currently provided; or
- An aerodrome which would normally have ATC services provided but such services are presently unavailable.

**NOTAM:** A notice containing information concerning establishment, condition or change in facility, service, procedure or hazard which is essential to personnel concerned with flight operations.

**SOPs:** Any procedures described in the operations manual of an AOC holder or a self-administering organisation.

**Radio:** VHF airband two-way radio.

**Registered aerodrome:** An aerodrome registered by CASA under CASR subpart 139.C. A registered aerodrome meets certain minimum operating standards and is regularly inspected. (See also *Certified aerodrome*.)

**UNICOM [AIP GEN 3.4]:** A non-ATS communications service provided to enhance the value of information normally available about a non-towered aerodrome.

### 3. Introduction

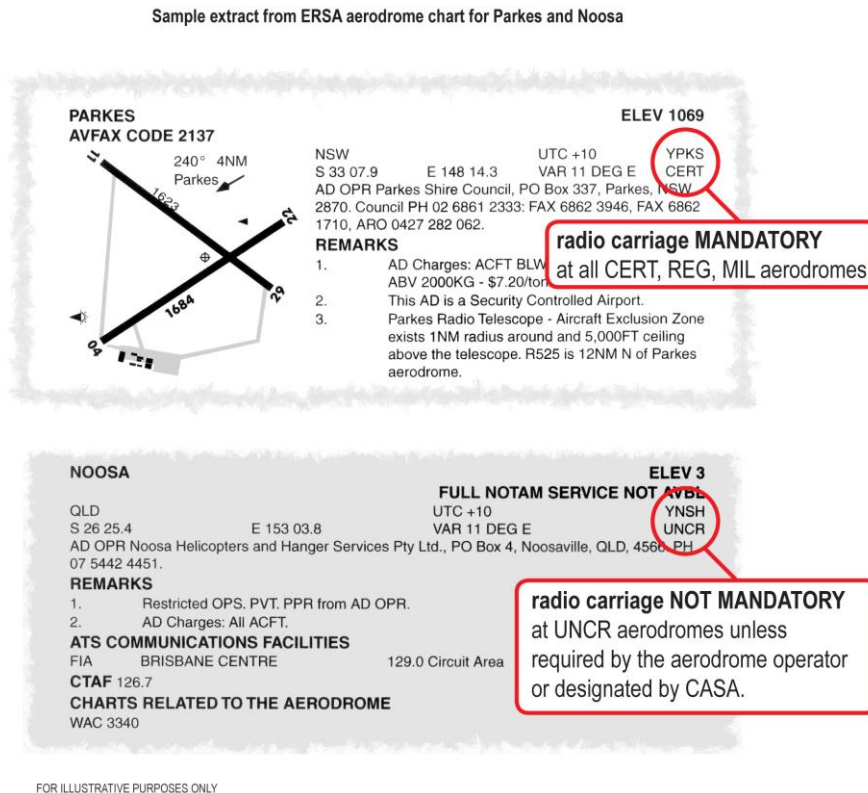
3.1 CARs 166-166E detail the requirements for operating in the vicinity of a non-towered aerodrome. For aerodromes where the carriage of radio is required or where special procedures relating to the circuits at individual aerodromes apply, pilots should consult the current ERSA and check the latest NOTAMs before flight. CAR 243 details the requirements for pilots when an aircraft is fitted with a radio to maintain a listening watch at all times.

3.2 The use of 'standard' aerodrome traffic circuit procedures and radio broadcast procedures for all radio-equipped aircraft as described in the AIP and VFG is strongly recommended at all non-towered aerodromes.



3.3 At non-towered aerodromes where the carriage of radio is required, the standard radio calls described in paragraph 6.3 of this CAAP should be made. Non-towered aerodromes where the carriage of radio is required are all certified, registered and military aerodromes, as identified and published in ERSA, and any other aerodromes designated by CASA on a case by case basis, as published in ERSA or by NOTAM.

**Note:** As at 3 June 2010, CASA had not designated any additional aerodromes where the carriage of radio is required.



**Figure 1** — How mandatory radio carriage is depicted in ERSA

3.4 This CAAP provides guidance on a code of conduct (good airmanship) which, when followed, will provide improved situational awareness and safety for all pilots when flying at, or in the vicinity of, non-towered aerodromes.

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

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

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

3.6 Non-towered aerodromes can have a mix of passenger-carrying aircraft, IFR/VFR, smaller general aviation aircraft, VFR agricultural aircraft, and various VFR sport and recreational aircraft at any one time.

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

3.8 Transponders can be detected by aircraft equipped with ACAS (TCAS), allowing them to 'see' other aircraft and take evasive action. Pilots of transponder-equipped aircraft should at all times ensure their transponder is switched to ON/ALT (Mode C), including when operating in the vicinity of a non-towered aerodrome. In the event of a radio failure, it is important that pilots select code 7600 and Mode C on their transponders and continue squawking.

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

## **4. Standard traffic circuit procedures**

### **4.1 Traffic Circuit Direction**

4.1.1 The standard aerodrome traffic circuit facilitates the orderly flow of traffic, and is normally a left circuit pattern with all turns to the left [CAR 166A]. When arriving at an aerodrome to land, the standard circuit will normally be joined on the upwind, crosswind or downwind legs, at or before mid-downwind. Landings and take-offs should be accomplished on an operational runway most closely aligned into the wind (the active runway).

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

4.1.3 Aerodromes that have right-hand circuit requirements are listed in the ERSA.

*Note: At many aerodromes at night, circuit directions are different to daytime. Generally, the differences are because of terrain or obstructions or noise abatement.*

### **4.2 Maximum speed**

4.2.1 Aircraft should be flown in the circuit at an indicated airspeed (IAS) not above 200 KT.

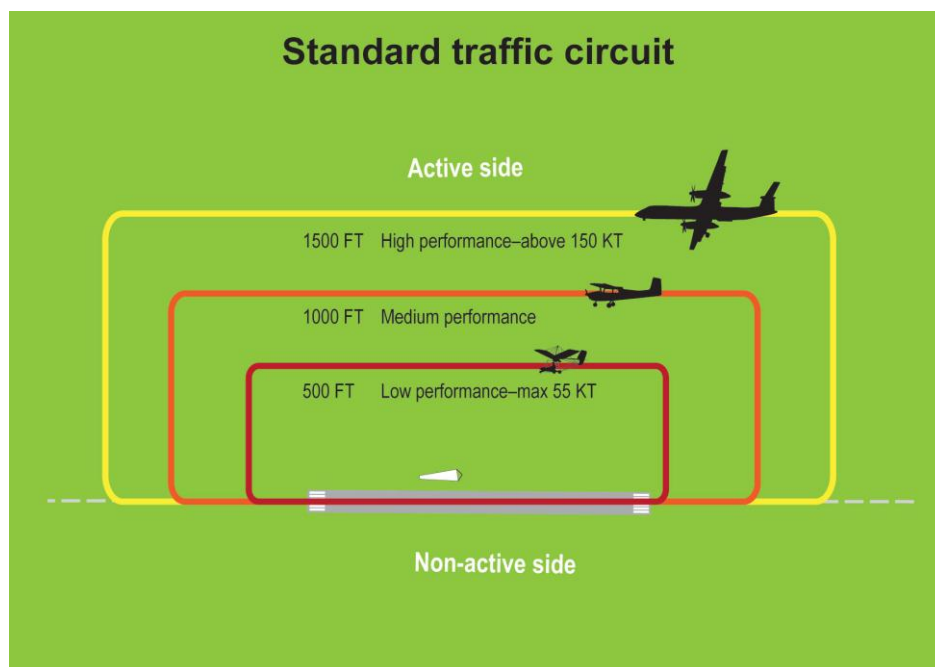


### 4.3 Circuit heights (also refer to Figure 2 below)

4.3.1 Aircraft by convention should fly the standard traffic circuit at the following heights above aerodrome elevation:

Type of aircraft	Standard circuit speed range	Standard circuit height
High performance (includes jets and many turboprops)	Above approximately 150 KT	1500 FT above aerodrome elevation
Medium performance (includes most piston engine aircraft)	Between approximately 55 and 150 KT	1000 FT above aerodrome elevation
Low performance	Approximately 55 KT maximum	500 FT above aerodrome elevation

**Table 1** — ‘Standard’ circuit heights depend on aircraft performance



**Figure 2** — ‘Standard’ aerodrome traffic circuit

4.3.2 During initial climbout, the turn onto crosswind should be made appropriate to the performance of the aircraft, but in any case not less than 500 FT above terrain [CAR 166A(2)(f)] so as to be at circuit height when turning onto downwind.

4.3.3 Pilots may vary the size of the circuit depending on:

- the performance of the aircraft; or
- safety reasons; or
- in accordance with the AFM/POH requirements or company SOPs.

#### 4.4 Departing the circuit area

4.4.1 When departing from the aerodrome circuit area, aircraft should depart by extending one of the standard circuit legs. However, an aircraft should not execute a turn opposite to the circuit direction unless the aircraft is well outside the circuit area and no traffic conflict exists. This will normally be at least 3 NM from the departure end of the runway. The distance may be less for aircraft with high climb performance. The distance should be based on pilots being aware of traffic and the ability of the aircraft to climb above and clear of the circuit area.

**Caution: Be aware of traffic intending to join the circuit by the recommended overfly procedure as they can be 2000 FT or higher above aerodrome elevation.**

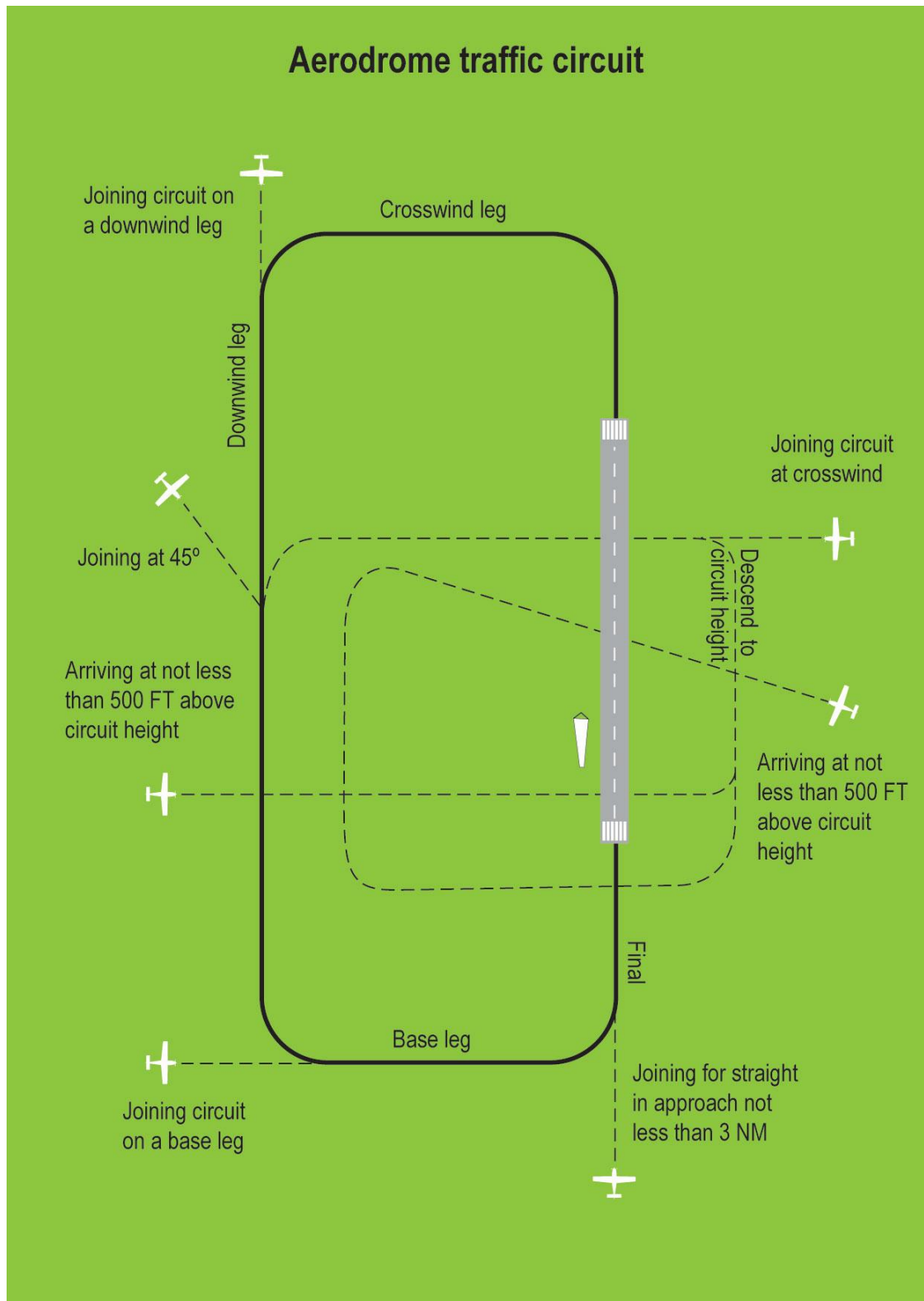
#### 4.5 Final approach

4.5.1 The turn onto final approach should be completed by a distance and height that is common to the operations at the particular aerodrome and commensurate with the speed flown in the circuit for the aircraft type. In any case, the turn onto final should be completed by not less than 500 FT above aerodrome elevation. This should allow sufficient time for pilots to ensure the runway is clear for landing. It will also allow for the majority of aircraft to be stabilised for the approach and landing.

#### 4.6 Arrival and Departure procedures (refer Figure 3 overleaf)

4.6.1 It is expected that pilots departing and arriving at non-towered aerodromes where the carriage of radio is mandatory will monitor their radios and broadcast their intentions in accordance with the minimum calls set out in paragraph 6.3 below. Pilots should also make additional broadcasts when considered necessary to minimise any risk of collision [*CAR 166C(2)*].

4.6.2 At aerodromes where the carriage of radio is not mandatory, good airmanship dictates that pilots of radio-equipped aircraft would also monitor their radios and broadcast their intentions in accordance with the minimum calls in paragraph 6.3. Pilots should also observe local and published noise abatement procedures and curfews.



**Figure 3** — Aerodrome traffic circuit showing arrivals and joining

4.6.3 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. The pilot should overfly or circle the aerodrome at least 500 FT above the circuit altitude, usually 2000 FT or more above the aerodrome elevation. When the circuit direction has been determined, the pilot should position the aircraft to a point well clear (normally the non-active side of the circuit) before descending to the circuit altitude that equates to the aircraft's performance (see Figure 3). Pilots should not descend into the active side of the traffic circuit from directly above the aerodrome (see Appendix 1 of this CAAP).

4.6.4 For low performance ultralight aircraft and rotorcraft with a maximum speed of approximately 55 KT, it is recommended that the aircraft overfly midfield at 500 FT above aerodrome elevation. This will minimise the risk of conflict with higher or faster traffic (see also paragraph 5.5 in this CAAP).

4.6.5 For arriving and intending to join the circuit from overhead, the aircraft should descend on the non-active side of the circuit and be established at its circuit altitude as it crosses the runway centreline on crosswind, at between midfield and the departure end of the runway.

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

4.6.7 On downwind, the applicable circuit altitude should be maintained until commencement of the base leg turn. The base leg position is normally when the aircraft is approximately 45 degrees from the runway threshold. Along the base leg, continue to lookout and maintain traffic separation.

4.6.8 When on the final leg, confirm that the runway is clear for the landing.

#### 4.7 Go arounds (refer Figure 4 overleaf)

4.7.1 A pilot who elects to abort a landing should manoeuvre to keep other traffic in sight. Maintain a safe distance from all aircraft and rejoin the circuit when it is safe to do so.

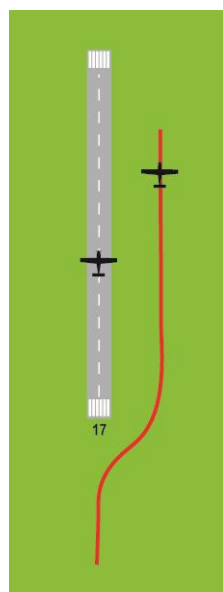


Figure 4 — Suggested go around manoeuvre

## 4.8 Straight-in approaches

4.8.1 Straight-in approaches, whilst not prohibited, are not a recommended standard procedure. CAR 166B does not preclude pilots from conducting straight-in approaches provided certain conditions are met. 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. CAR 166B(2)(b) requires the pilot – when conducting a straight-in approach – to give way to any other aircraft established and flying in the circuit pattern at the aerodrome.

4.8.2 CAR 166B(2) requires pilots, before conducting a straight-in approach, to determine the wind direction and speed and the runway in use at the aerodrome.

4.8.3 There are several ways to determine the wind direction, speed and runway in use:

- AWS, AWIS, AAIS, CA/GRS or UNICOM;
- Radio contact with a ground-based radio communication service, company agent, approved observer [CAR 120], or aircraft currently operating at the aerodrome; or
- Visual indications if the information cannot be determined by the above means.

4.8.4 When conducting a straight-in approach, the aircraft must be established on final at not less than 3 NM from the landing runway's threshold [CAR 166B(2)(c)].

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

4.8.6 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.
- Within 3 NM, minor corrections such as normal speed and track adjustments that are necessary to maintain a stable approach are all that should be required on final approach. Pilots conforming to the circuit pattern – particularly when on base – should optimise their visual scan for traffic along the final approach path.
- The aircraft's transponder should be squawking, and its external lights (where fitted) should be illuminated, when on final approach. They should remain on until the aircraft has landed and clear of all runways.
- An aircraft established on the base or final leg for any runway has priority over an aircraft carrying out a straight-in approach.

## 4.9 Joining on base leg

4.9.1 Joining on base leg, whilst not prohibited, is not a recommended standard procedure, i.e. CASA recommends pilots join the circuit on either the crosswind or downwind leg. However, pilots who choose to join on base leg should only do so if they:

- have determined the wind direction and speed; and
- have determined the runway in use; and
- give way to other circuit traffic and ensure the aircraft can safely (no traffic conflict likely) join the base leg applicable to the circuit direction in use at the standard height (refer to paragraph 4.3.1 above); and
- broadcast their intentions.

#### **4.10 Transiting flights**

4.10.1 When transiting in the vicinity of a non-towered aerodrome, pilots should monitor the designated CTAF.

4.10.2 Pilots should respond to other traffic broadcasts and advise their position and intention so as to avoid traffic conflict.

4.10.3 Pilots should avoid flying over the aerodrome at an altitude that could conflict with operations in the vicinity of the aerodrome.

*Note:* See also paragraph 7.6 of this CAAP.

#### **4.11 Radio unserviceability**

4.11.1 At non-towered aerodromes where the carriage of radio is required, CAR 166E allows for continuation of a 'no radio' arrival or departure in certain circumstances.

4.11.2 If a radio failure occurs either enroute to or in the circuit of the aerodrome, the pilot may continue to land at that aerodrome provided:

- where equipped — the aircraft's landing and anti-collision lights, and its transponder, are turned on; and
- if enroute — the pilot uses the overfly joining procedure (see Appendix 1 of this CAAP).

4.11.3 A pilot may depart the aerodrome with an unserviceable aircraft radio and fly to another aerodrome for repairs, provided that the aircraft – where equipped – displays its landing and anti-collision lights, and has its transponder turned on.

4.11.4 A pilot should avoid planning to arrive at or depart from an aerodrome for radio repairs during the known hours of scheduled RPT operations. For aerodromes where there is a UNICOM or CA/GRS, pilots should by non-radio means where possible make contact and advise their intentions before conducting operations.

#### **4.12 Non radio-qualified pilot or non radio-equipped aircraft**

4.12.1 In exceptional circumstances, CAR 166E makes provision for a pilot who is not qualified to use an aircraft radio, or where the aircraft is not equipped with a radio, to operate in the vicinity of a non-towered certified, registered, military or designated aerodrome.

4.12.2 The aircraft must be operated:

- in VMC by day; and
- to arrive or depart in the company of another aircraft that is radio-equipped and flown by a radio-qualified pilot which will allow the latter to make radio calls on behalf of both aircraft. The radio-equipped aircraft should be manoeuvred to keep the no-radio aircraft at a safe distance [*CAR 163*] and in sight at all times in order to accurately report its position.

#### **4.13 Night Circuits**

4.13.1 For both IFR and NVFR flights, night circuits are generally more demanding than daytime circuit operations and require increased vigilance.

4.13.2 Night circuits for training shall not be conducted at a height less than 1000 FT above aerodrome elevation. Refer to CAO 29.2: *Air service operations – night flying training*.



4.13.3 NVFR pilots should refer to CAAP 5.13-2(0): *Night Visual Flight Rules Rating*.

4.13.4 IFR pilots should consult AIP ENR 1.5 for guidance when conducting a Non-Precision Approach (NPA) and visual circling manoeuvring.

## **5. The traffic mix**

5.1 At non-towered aerodromes, there may be regular public transport and passenger charter, gliders, parachutists, helicopters, gyroplanes, ultralights, balloons, general aviation aircraft, and agricultural aircraft operations.

### **5.2 Regular public transport aircraft operations**

5.2.1 At certain non-towered aerodromes, there can be regular public transport operations that may include large turboprop or jet aircraft. These aircraft have different operating parameters/criteria to those of many general aviation aircraft. They operate under the instrument flight rules and will be operating to their particular company standard operating procedures. It is often more difficult for pilots of large aircraft to see smaller aircraft because of their high nose attitude at slower speeds. This is especially an issue when they are making an approach. It is essential that even though the smaller aircraft pilot may have seen the large aircraft, they continue to make broadcasts and respond to broadcasts and not just assume that the larger aircraft is aware of their position.

5.2.2 General aviation pilots should be aware that, in certain circumstances, passenger transport aircraft may not be able to use the active runway. Passenger transport aircraft are required to operate under more stringent regulations, in particular aircraft performance regulations. For example, where an aircraft departs downwind and the take-off distance is increased, it could be because of a performance limitation or increased safety margin whereby terrain clearance is taken into consideration during the initial climb out after take-off. Similarly, landing into wind may not always be possible when various performance limitations are taken into account.

### **5.3 Glider operations**

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

5.3.2 Winch operations can occur at all aerodromes and pilots should check and review ERSA and the latest NOTAMs for specific information.

5.3.3 Where gliders are operating from the active runway, they may not be able to give way to other aircraft when landing. CAO 95.4 details the flight conditions, exemptions and limitations imposed on gliding operations.

5.3.4 A double white cross displayed adjacent to the wind direction indicator at aerodromes indicates gliding operations are in progress. Aeronautical charts also use the double cross to indicate glider operations. Pilots should consult the latest NOTAMs for any additional information.

## 5.4 Parachuting operations

5.4.1 In Australia, in certain circumstances, parachuting operations are permitted through cloud and so can take place on overcast days [CAAP 152-1(0) – *Parachuting Through Cloud*].

5.4.2 Pilots flying parachuting aircraft will broadcast on all of the associated frequencies. For example, if the jump commences in G airspace and will land at a non-towered aerodrome, advisory calls will be made on both the Class G airspace frequency and the frequency in use for the aerodrome.

5.4.3 Where parachute operations occur, parachute symbols are sometimes depicted on aeronautical charts. The ERSA also details the aerodromes where parachute operations are conducted. Pilots should consult the latest NOTAMs for any additional information.

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

## 5.5 Helicopters and gyroplanes operations

5.5.1 Helicopters can arrive and depart aerodromes from various directions. Pilots of helicopters can choose to operate in the circuit and fly a circuit similar to a fixed wing aircraft but at a height not more than 500 FT above the aerodrome elevation and closer to the runway. Check ERSA for any noise abatement procedures.

5.5.2 Helicopters can also operate contra-direction circuits on the opposite side of the runway at 500 FT above aerodrome elevation. Check ERSA for circuit direction requirements. Pilots of helicopters approaching to land at a marked helipad or suitable clear area should avoid the flow of fixed wing aircraft.

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

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

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

## 5.6 Ultralight operations

5.6.1 The term ‘ultralight’ applies to many small recreational aircraft that include trikes, powered parachutes, and other small fixed wing aircraft that cruise at maximum speeds of up to about 55 KT. Pilots of these aircraft should conduct their standard circuit at 500 FT above aerodrome elevation.

5.6.2 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 provide separation from higher and faster traffic.

5.6.3 Ultralight aircraft pilots who choose to use the overfly join procedure above the circuit altitude should be aware:

- Faster larger aircraft may not be able to see you easily.
- Faster larger aircraft create significant wake turbulence.

- Faster larger aircraft will not be able to slow to the speeds of an ultralight aircraft and follow.
- Faster larger aircraft — prior to arriving in the circuit and when below 10,000 FT — can be at speeds up to 250 KT. Therefore, although aircraft should be at 200 KT maximum in the circuit, an aircraft reporting at 20 NM from the aerodrome could be in the vicinity of the circuit within 5 minutes.

5.6.4 Ultralight pilots should consult AIP/VFG, ERSA, relevant charts, and the latest NOTAMs for the most up-to-date information and procedures.

*Note 1: Helicopters may also be operating in the circuit at 500 FT above aerodrome elevation.*

*Note 2: The 95 series of CAOs lists flight conditions, limitations and exemptions for ultralights, gyroplanes, and hang gliders.*

## 5.7 Fixed wing and rotary wing aerial application (agricultural) aircraft operations

5.7.1 Pilots should be aware there are non-towered aerodromes from where ‘aerial application’ operations are conducted.

5.7.2 Aerial application (agricultural) aircraft are permitted to conduct aerial application operations which involves 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; and
- give priority to other traffic.

5.7.3 The requirements for these operations, and also their separation from RPT flights, are specified in CASR 137.155 and CASR 137.160.

## 6. Radio broadcasts

6.1 CAR 166C requires a pilot 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. A broadcast must include:

- the name of the aerodrome;
- the aircraft’s type and call sign; and
- the position of the aircraft and the pilot’s intentions.

6.2 Effective radio communication involves using standard aviation phraseology as detailed in the Flight Radiotelephone Operator Licence (FROL) syllabus and in the AIP. Pilots are expected to maintain a listening watch and respond appropriately to applicable transmissions.

6.3 When operating in the vicinity of a non-towered aerodrome, it is expected that all pilots would make the following minimum positional broadcasts from aircraft that carry a VHF airband radio:

Item	Circumstance (non-towered aerodromes)	Pilot's radio broadcasts
1	The pilot intends to take-off.	Immediately before, or during, taxiing.
2	The pilot intends to enter a runway.	Immediately before entering a runway.
3	The pilot is inbound.	10 NM or earlier from the aerodrome, commensurate with aircraft performance and pilot workload, with an ETA for the aerodrome
4	The pilot is ready to join the circuit.	Immediately before joining the circuit.
5	<ul style="list-style-type: none"> <li>• The pilot intends to carry out a straight-in approach; or</li> <li>• Base leg join.</li> </ul>	On final approach at not less than 3 NM from the threshold. Prior to joining on base
6	The pilot intends to fly through the vicinity of, but not land at, a non-towered aerodrome.	When the aircraft enters the vicinity of the aerodrome (as defined).

**Table 2**

*Note 1: Some distances above refer to the runway threshold and others to the aerodrome reference point (ARP). Pilots should be aware that a GPS indication of 3 NM from an aerodrome may not be 3 NM to the runway threshold.*

6.4 In addition:

- Listening to other pilot broadcasts increases situational awareness and assists the sighting and avoidance of other aircraft.
- Where it is determined there is a potential for traffic conflict, radio broadcasts should be made as necessary to avoid the risk of a collision or an airprox event. A pilot should not be hesitant to call and clarify the other aircraft's position and intentions if there is any uncertainty.
- It is essential to maintain a diligent lookout because other traffic may not be able to communicate on the radio for various reasons — they might be tuned to the wrong frequency, selected the wrong radio, have a microphone failure, or have the volume turned down.

6.5 The standard broadcast format for low and medium performance aircraft is:

- (Location) Traffic *Parkes Traffic*
- (Aircraft Type) *Cessna 172*
- (Call sign) *Zulu Foxtrot Romeo*
- (Position/Intentions) *One-zero miles north inbound, on descent through four-thousand-two-hundred, estimating the circuit at three-six*
- (Location) *Parkes.*

6.5.1 Pilots should be aware that a variety of radio callsigns are in use. For example:

- Passenger transport: '*Q-link 2719*'
- Recreational: '*Jabiru 5234*'

- Military: ‘*Stallion 22*’
- Law enforcement: ‘*Polair 5*’
- Foreign-registered: ‘*November 1 5 Yankey*’
- VH-ZFR: ‘Zulu Foxtrot Romeo’

6.5.2 Calls should be made as clearly and concisely as possible using the standard phraseology. Speak at a normal pace, as rapid speech can make transmissions difficult to understand by other pilots.

6.5.3 Be careful not to ‘clip’ your transmission when stating your location as confusion can arise at aerodromes that are close together sharing the same CTAF.

6.5.4 Ideally pilots should make circuit broadcasts prior to making a turn because banking aircraft are easier to see.

6.5.5 A simple strategy to remember when flying in the circuit is ‘Look’, ‘Talk’ and ‘Turn’.

6.5.6 Broadcast calls should be made briefly and clearly. Think about what to say before transmitting. Positional and other broadcasts necessary to minimise traffic conflict should be made using standard phraseology — for example: joining circuit, base, and vacating the runway. Effective communication and increased traffic awareness will help prevent a collision or an airprox event.

6.5.7 Avoid the use of local terminology in position reports, e.g. use ‘Bundaberg’ instead of ‘Bundy’.

6.5.8 When an AFRU is in operation, be careful not to momentarily break your transmission as the AFRU will automatically over-transmit your subsequent broadcast.

6.5.9 For Broadcast Areas, the lateral and vertical boundaries are defined in the AIP MAP. The vertical boundary of a broadcast area can be:

- a) Surface to 5,000FT AMSL; or
- b) Surface to the base of CTA if 8,500FT or less; or
- c) Surface to to a nominated level.

6.5.10 Pilots operating within a broadcast area are to maintain listening watch on the broadcast area CTAF depicted in the AIP MAP. Pilots are reminded that they are to make the recommended broadcasts in Table 2 any time they are in the vicinity of any non-towered aerodrome within the broadcast area.

## **7. Hazards**

### **7.1 Aircraft size and performance**

7.1.1 General aviation pilots should be aware that aerodromes with runways of 1400 metres or more may have operations using jet or large turboprop aircraft. For aerodromes that have high performance traffic in the circuit, the minimum overfly height should be no lower than 2000 FT above aerodrome elevation. Runway lengths are published in ERSA.

7.1.2 RPT and other professional pilots should be aware that at many of the aerodromes they operate into, other general aviation aircraft, gliders and ultralights may also be operating.

## 7.2 Downwind takes-off and landings

7.2.1 Take-off or landing downwind is not recommended as a standard procedure. Pilots wherever possible should use the runway most closely aligned into wind (the active runway).

7.2.2 Pilots must operate within the limitations prescribed in the Aircraft Flight Manual [CAR 138].

7.2.3 Pilots should consider the following hazards if planning to take off or land downwind [CAR 92]:

- **Wind strength** — just above ground level may be significantly stronger than as indicated by the windsock.
- **For take off** with wind gradient or windshear — higher groundspeed at lift off; a longer take off distance required; a shallower angle of climb; degraded obstacle clearance; and in the event of an emergency, landing straight ahead touchdown will be at a higher groundspeed.
- **For landing** with wind gradient or windshear — higher groundspeed at touchdown; a longer landing distance required.

## 7.3 Take-off and landing separation

7.3.1 When waiting to take off behind another aircraft, pilots should be aware of the separation standards published in the AIP, i.e.:

- Wait until the departing aircraft has crossed the upwind end of the runway or has commenced a turn;
- If the runway is longer than 1800 metres, then wait until the departing aircraft has become airborne and is at least 1800 metres ahead; or
- If both aircraft have a MTOW under 2000 KG, wait until the departing aircraft has become airborne and is at least 600 metres ahead.

7.3.2 For a landing aircraft, the approach should not be continued beyond the runway threshold until:

- A preceding departing aircraft has commenced a turn or is beyond the point on the runway at which the landing aircraft could be expected to complete its landing roll and there is sufficient distance to manoeuvre safely in the event of a missed approach; or
- A previous landing aircraft has vacated the runway.

7.3.3 Pilots should be vigilant when using another runway that is **not** the active runway and ensure that they do not create a hazard to aircraft that are using the active runway. Conversely, pilots using the active runway should ensure that aircraft operating on the non-active runway have held short or crossed the active runway before commencing a take off or continuing to land.

## 7.4 Wake turbulence and windshear

7.4.1 Wake turbulence is produced by all aircraft and, if encountered, 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.

7.4.2 In calm conditions, wake turbulence may not dissipate for several minutes. Aircraft should position within the traffic circuit with sufficient spacing to avoid encountering wake turbulence.



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

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

7.4.5 Windshear can occur anywhere in the circuit but is most dangerous when close to terrain. For example, dust devils ('willy willies') are visible windshear and can be common at outback aerodromes. Pilots encountering a windshear event should immediately consider a maximum performance climb to fly out of the situation.

## **7.5 Collision avoidance (maintaining separation in the circuit)**

7.5.1 The most hazardous area is within 5 NM of an aerodrome and up to 3000 FT above aerodrome elevation. It is important for all pilots to maintain a good situational awareness. Inbound pilots should have the cockpit and their mind clear of distractions. Passengers should be briefed not to distract the pilot. However, if a passenger becomes aware of imminent danger, then he/she should inform the pilot.

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

7.5.3 Most collisions occur on downwind or on final approach. There are many distractions that include configuring the aircraft, completing checklists, setting equipment and communicating, however, this is precisely the time to be looking outside. Early completion of checklists will help to avoid distractions. Good height and speed control to maintain separation (including use of flaps) is essential. If a pilot determines that adequate separation cannot be maintained during any part of the approach, a go around should be initiated sooner rather than later.

7.5.4 CAR 161 and CAR 162 detail the rules and procedures for right of way and prevention of collisions. Pilots should have a sound understanding of these rules when giving way, approaching head on, and overtaking in the circuit. The CARs are published on the ComLaw website at the following internet address:

<http://www.comlaw.gov.au/comlaw/management.nsf/lookupindexpagesbyid/IP200400553?OpenDocument>

## **7.6 Collision avoidance (maintaining separation in the 'vicinity' of a non-towered aerodrome)**

7.6.1 Increased collision risks exist for both IFR and VFR traffic when instrument approaches are conducted at a non-towered aerodrome where there is cloud, or visibility is reduced due to haze or smoke but VFR conditions exist below the low visibility layer.

When these situations exist, it is possible for a pilot flying an instrument approach in cloud to become visual and suddenly encounter a VFR aircraft in the circuit. Diligent radio broadcasts and continuous visual scanning are essential in avoiding an airprox situation.

7.6.2 It would be expected that VFR pilots, on hearing an IFR pilot broadcast his/her intention to make an instrument approach, would establish contact to provide situational awareness to the IFR pilot. Information which would be useful to the IFR pilot includes aircraft type, position in the circuit or vicinity, with intentions.

7.6.3 Pilots operating under the VFR must remain clear of cloud and have in-flight visibility in accordance with VMC criteria [AIP ENR 1.2 and VFG].

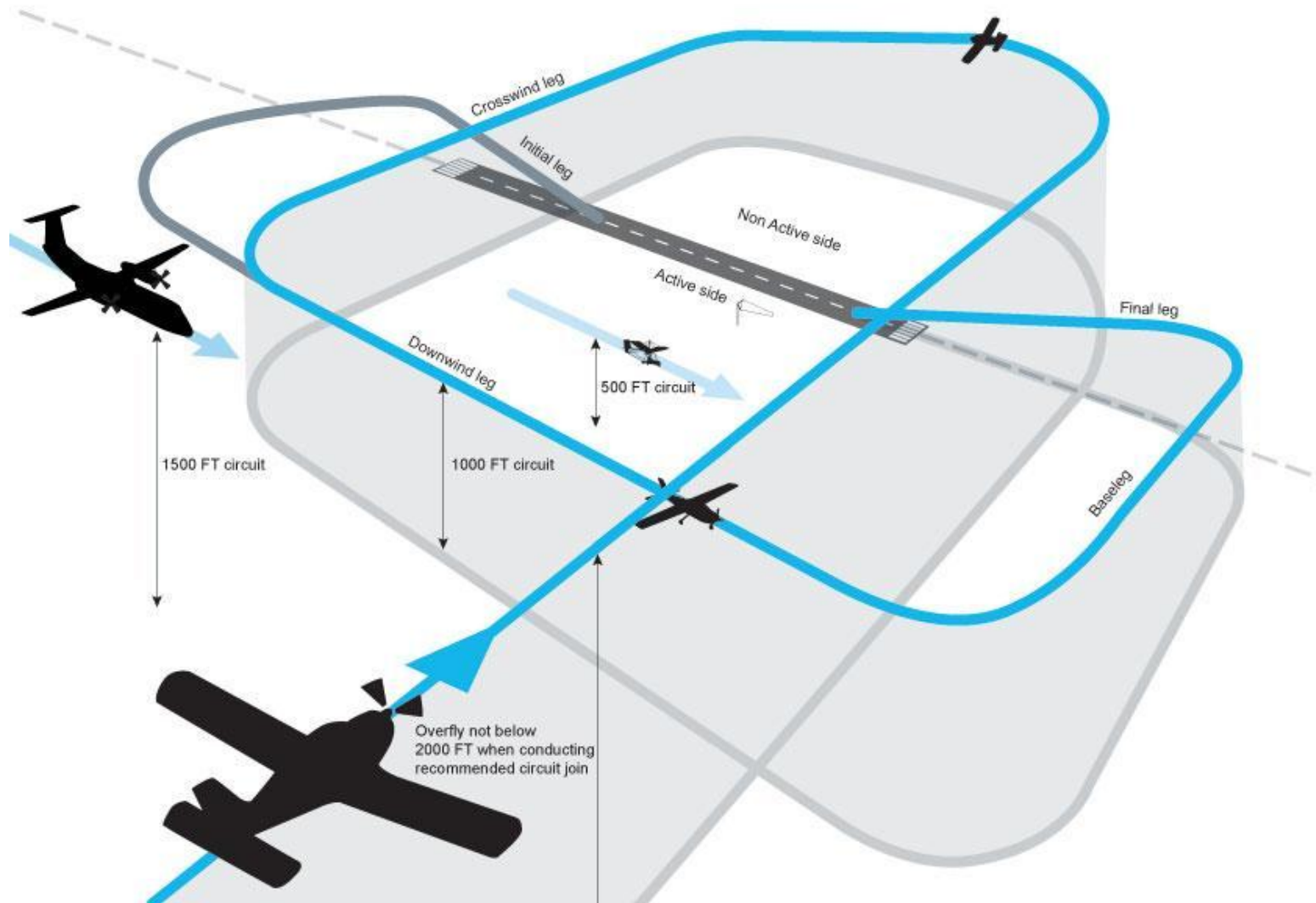
## 7.7 Practice instrument approaches

7.7.1 Pilots who wish to conduct practice instrument approaches in VMC conditions should be particularly alert for other aircraft in the circuit so as to avoid impeding the flow of traffic. **IFR pilots should give position reports in plain English to be easily understood by VFR pilots who generally have no knowledge of IFR approach points or procedures**, e.g. positions should include altitudes and distance and direction from the aerodrome. Providing position reports to VFR pilots that contain outbound/inbound legs of the approach or RNAV fixes will generally be of little assistance to establish traffic separation.

*Note 1: At all times, in a training situation, one of the pilots in the aircraft should have an unrestricted view outside. Therefore instrument simulation should only be by a 'hood' or 'foggles', i.e. not by covering any part of the windscreen.*

*Note 2: For an aeroplane with a single pilot conducting practice instrument approaches, it would be unacceptable to conduct an approach without a safety pilot if the pilot intended to solely refer to the aircraft instruments i.e. under a 'hood' or with 'foggles'.*

### APPENDIX 1 – Recommended Circuit Join



Revised: August 2012

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