Before you fly

Make sure:
• your licence is valid
• you can comply with your licensing conditions
• you plan your route thoroughly
• you carry current charts and documents

Always check:
• ERSA
• NOTAMs
• the weather

The Visual Flight Rules Guide aims to assist pilots to fly safely under the visual flight rules anywhere in Australia. Information relevant to IFR operations has been included to the extent that it could be of benefit to the visual pilot. The information contained in this guide was correct at the time of publication and is subject to change without notice. It has been prepared by CASA Safety Promotion for information purposes only. This guide outlines basic procedures—it should not be used as a substitute for the aviation legislation, operator’s manuals or the AIP. Please visit vfrg.casa.gov.au regularly for updates.

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Can you exercise the privileges of your licence?

Essential for all pilots

- **Medical certificate**—Do you have a valid medical certificate appropriate to your flight? Can you comply with all the conditions of its issue?

- **Flight review**—Do you have a valid flight review applicable to your flight?
  
  **Note**: A flight review of your aircraft class rating will not satisfy the flight review requirements for your night VFR rating, low level rating, private instrument rating.

- **General competence**—Are you satisfied you can apply the normal and non-normal operating procedures, and are able to navigate and operate the aircraft systems within the general competency requirements of CASR 61.385?

- **Recency**—Do you have the required and relevant recent experience to undertake your flight? See below

Day VFR

- No recency requirements apply, however, general competency requirements do apply.

To carry passengers—day VFR

- At least three take-offs and landings in the past 90 days in an aircraft of the same category as the proposed flight, or in an approved simulator, by day or night or

- Has passed a flight test, review or check with at least one take-off and landing by day or night

Night VFR

- One night take-off and landing within six months or

- Has been assessed as competent by a NVFR-endorsed flight instructor

To carry passengers—night VFR

- At least three take-offs and landings in the past 90 days in an aircraft of the same category as the proposed flight, or an approved simulator, by night only; or

- Has passed a flight test, review or check with at least one take-off and landing by night
Pilot flight check

1. Current medical/DL medical?  
   Yes →  
   No → Do not operate aircraft as a pilot  
   
   See page 1.5

2. Flight review?  
   Yes → Complete before flying in command  
   No → Obtain before flight planning  
   
   See page 1.10

3. Current maps and charts?  
   Yes → Obtain weather forecast and NOTAMs  
   No → Obtain before flight planning  
   
   See page 2.2, 2.35, 2.83

4. Weather forecast and NOTAM?  
   Yes → Obtain weather forecast and NOTAMs  
   No → Obtain before flight planning  
   
   See pages 2.2, 2.35, 2.83

5. Flight plan?  
   Choose suitable route and complete calculations  
   See pages 2.1, 2.6  
   Appropriate level  
   See page 3.55, 3.56  
   Avoiding controlled airspace  
   See pages 1.77, 2.32  
   Flight fuel  
   See pages 1.18, 2.18  
   Last light  
   See page 2.24  
   Weight and balance calculations  
   See page 2.10  
   Take-off and landing performance  
   See page 2.10  
   Safety equipment  
   See page 2.67  
   
   airservicesaustralia.com  
   Briefing  1800 805 150  
   Helpdesk  1800 801 960

6. Checked CTA and restricted area boundaries?  
   Yes → Go to 6  
   No →  

Go to 6
6 SARTIME flight or CTA
- If in Class G submit SARTIME; or
- If in CTA/CTR submit domestic/ICAO notification

7 Checked aircraft and personal documents? See page 1.16
- Pilot’s licence
- Medical
- Aircraft flight manual
- Aircraft maintenance release

8 Planned for contingencies? See page 2.4, 2.6, 2.62
- Deteriorating weather
- Radio failure
- Diversions
- Arrival procedures (for example ‘Clearance not available, remain outside Class C/D airspace’)

9 Aircraft pre-flight inspection? See page 1.25, 2.73
- Daily inspection or pre-flight inspection as per aircraft system of maintenance or flight manual
- Maintenance release checked for validity and maintenance required
- Fuel: check for correct grade, quantity, and contamination

Yes Enjoy your flight

No Leave flight note with a responsible person
Safety promotion products

Visit CASA’s online store: www.casa.gov.au/onlinestore for a range of products for VFR pilots
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General

Introduction

This Visual flight rules guide (VFRG) has been designed primarily for VFR pilots engaged in domestic operations. Material relating to IFR; commercial or military operations has therefore been omitted unless it contributes to the understanding of a particular topic.

For ease of understanding, the wording has been modified considerably from that of the source documents. Since the precise wording of a regulation may be required by some readers, references to the source documents have been provided throughout the text where appropriate.

A section is included for helicopter pilots that explains differences between fixed-wing and rotary-wing operations. A night visual flight rules (NVFR) section is also included for appropriately rated pilots.
The rules structure

The following section outlines the structure of the various rules, regulations and guidance material.

- **Civil Aviation Act 1988 (CAA)**
- **Civil Aviation Regulations 1988 (CARs)**
  - Civil Aviation Orders (CAOs)
  - Civil Aviation Advisory Publications (CAAPs)
  - Airworthiness Advisory Circulars (AACs)
- **Civil Aviation Safety Regulations 1998 (CASRs)**
  - Aeronautical Information Publication (AIP)
  - En Route Supplement Australia (ERSA)
  - Departure and Approach Procedures (DAP)
  - AIP Supplements (SUPs)
  - Notices to Airmen (NOTAMs)
  - Aeronautical Information Circulars (AICs)
  - Terminal Area Charts (TACs)
  - En Route Charts (ERCs)
  - Planning Chart Australia (PCA)
  - Visual Navigation Charts (VNCs)
  - Visual Terminal Charts (VTCs)
  - Designated Airspace Handbook (DAH)
  - Runway Distance Supplement (RDS)
- **Airspace Act 2007**
- **Airspace Regulations 2007**
  - Manual of Standards (MOS)
  - Advisory Circulars (ACs)
  - Acceptable Means of Compliance (AMC)
  - Guidance Material (GM)
The Civil Aviation Act 1988 (CAA) is the act which established the Civil Aviation Safety Authority (CASA) with functions relating to civil aviation, in particular the safety of civil aviation.

The Civil Aviation Regulations 1988 (CARs) are the regulations made under the CAA. The CARs are currently in transition to the Civil Aviation Safety Regulations 1998.

The Civil Aviation Safety Regulations 1998 (CASRs) are currently being written and will ultimately incorporate CAR 1988. The numbering system for the ‘Parts’ of these regulations generally follows the US Federal Aviation Regulations.

Civil Aviation Orders (CAOs) are the second-tier legislation that expands in greater detail on the CARs, and are being subsumed into CASRs.

Manuals of Standards (MOS) are the second-tier legislation that expands in greater detail on the various CASR Parts.

Aeronautical Information Publication (AIP) is a set of documents containing aeronautical information of a lasting nature. The AIP book is the basic document and this is supplemented by:

- En Route Supplement Australia (ERSA) containing aerodrome, survival and other operational data.
- Departure and Approach Procedures (DAP East and DAP West) primarily for IFR operations.
- AIP Supplement (SUP) temporary changes to the information contained in the AIP which are published by means of special pages.
- Notice to Airmen (NOTAM) a notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.
- Aeronautical Information Circular (AIC) a notice containing information that does not qualify for the publication of a NOTAM, or for inclusion in the AIP, but which relates to flight safety, air navigation, technical, administrative or legislative matters.
- Terminal Area Chart (TAC)
- En Route Chart (High and Low) (ERC-H and ERC-L)
- Planning Chart Australia (PCA)
- Visual Navigation Chart (VNC) 1:500,000 with airspace detail.
- **Visual Terminal Chart (VTC)** 1:250,000 with airspace detail.
- **Designated Airspace Handbook (DAH)** contains the definitive description of Australian administered airspace and lists the volumes of airspace within the current airspace classifications (Classes A, C, D, E and G), protected airspace (prohibited, restricted and danger areas), and air routes, as well as other relevant material.

**World Aeronautical Charts (WACs)** are charts to a 1:1,000,000 scale which show topographical details but not details of airspace organisation.

**Civil Aviation Advisory Publications (CAAPs)** are numbered in accordance with the CARs to which they refer. They describe methods that, if adopted, ensure compliance with a particular regulation. CAAPs are only recommendations and do not necessarily outline the only available method.
Licensing

Medical certificate

**Flight crew licence** CASR 61.405, 61.410

Generally speaking, unless you have obtained permission from CASA, you must not perform any duty authorised by your licence unless you hold a current aviation medical certificate (CASR 61.405–61.415).

There are different types of aviation medical certificates.

- **The Class 1 medical certificate** demands the highest of medical standards as set out in CASR 67.150. A pilot must hold a Class 1 medical certificate to fly most commercial operations. A Class 1 medical certificate will also authorise the conduct of private and recreational flying operations (CASR 61.415).

- **The Class 2 medical certificate** allows for private flying operations and will also allow for recreational flying operations (CASR 61.410). It also allows commercial operations where no passengers are carried.

- **A Basic Class 2 medical certificate** is an alternative to a full Class 2 certificate for private operations. It has the following operational restrictions:
  - private operations by day under the visual flight rules (VFR) and below 10,000 feet
  - a maximum of five passengers
  - piston engine aircraft
  - maximum take-off weight (MTOW) of less than 8618kg
  - no use of operational ratings (eg. instructor rating, instrument rating)
  - no use of flight activity endorsements (eg. aerobatics, low level).

The period for which a medical certificate remains in force depends on the age of the pilot and the kind of medical certificate in question, but may be varied for other reasons (CASR 67.205, 67.210-67.220).

**Obligation to tell CASA of changes in medical condition** CASR 67.265

You must not fly if your ability to act efficiently is, or is likely to be, impaired due to illness or injury, no matter how minor it is.
Additionally, if you hold a private pilot licence or radiotelephone operator licence and the impairment lasts for 30 days or more, you must not fly until a designated aviation medical examiner (DAME) certifies that the impairment no longer exists. The above period is reduced to seven days for commercial pilots (CASR 67.265).

Suspension of medical certificate due to pregnancy is contained in CASR 67.235.

**Caution:** Over-the-counter or prescribed medication/drugs may reduce your ability to function properly while flying. Search for ‘testable drugs’ at www.casa.gov.au/aod, or talk to an aviation medical professional.

**Drug and alcohol management plans** CASR Part 99

Piloting an aircraft is a safety-sensitive aviation activity and pilots must comply with the requirements of CASR Part 99 in relation to drugs and alcohol. CASR Part 99 establishes a regime for random drug and alcohol testing conducted for, or on behalf of, CASA of all pilots in Australia.

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**Pilot licence**

**Duration of licence** CAR 269

The authorisation to exercise the privileges of a pilot licence remains in force until it is varied, suspended or cancelled. CASA may vary, suspend or cancel the authorisation (licence) if CASA is satisfied that any of the grounds specified in CAR 269 exist.

---

**Student pilot licence**

**Flying as a student pilot** CASR 61.112

A person who does not hold a pilot licence is authorised to pilot an aircraft if:

- the pilot in command of the aircraft is a flight instructor and the flight is for the purpose of receiving flight training or
- the flight is for a flight test for a pilot licence, or a rating or endorsement on a pilot licence
- the flight is approved by, and conducted under the supervision of, a flight instructor authorised by a Part 141 or 142 operator to conduct the supervision, conducted under VFR, and in accordance with the flight instructor’s approval.
The flight instructor must be either:

- on board, or at the aerodrome from which the flight began, or
- flying within 15 nautical miles of the aerodrome reference point, and
- providing guidance to the person in relation to the flight, and can be contacted during the flight by radio or other electronic means.

**General requirements for student pilots** CASR 61.113

A student pilot is authorised to conduct a solo flight in an aircraft only if the student pilot has an aviation reference number (ARN) and is at least 15 years of age.

A student pilot is not authorised to pilot an aircraft carrying passengers.

A student pilot is not authorised to pilot an aircraft other than a registered aircraft.

**Solo flights—medical requirements for student pilots** CASR 61.114

A student pilot is authorised to conduct the flight only if the student pilot holds:

- a class 1 or 2 medical certificate or
- a medical exemption, or a recreational aviation medical practitioner’s certificate, and CASA’s acknowledgement of the receipt of that certificate and carries them in flight (or a copy of them).

**Solo flights—recent experience requirements for student pilots**

CASR 61.115, CASA EX 46/18

A student pilot is authorised to conduct a solo flight in an aircraft only if:

- they have conducted a dual instructional flight within the previous 30 days and in the same type of aircraft and
- as a result of the flight, their solo flight time since the last instructional flight would not exceed 3 hours.

However, the above paragraph does not apply to the student pilot if they are enrolled in an integrated training course.

**Student pilots authorised to taxi aircraft** CASR 61.116

A student pilot is authorised to taxi an aircraft if they are approved to taxi the aircraft by a flight instructor.
Identity checks CASR 61.117

CASA may, by written notice, require the student pilot to provide evidence of their identity in accordance with paragraph 6.57(1)(a) of the Aviation Transport Security Regulations 2005.

Production of medical certificates and identification CASR 61.118

CASA may direct a student pilot to produce any or all of the following documents for inspection:

- the student pilot’s medical certificate or recreational aviation medical practitioner’s certificate—unless the student pilot holds a medical exemption to conduct a solo flight;
- a document that includes a photograph of the student pilot showing the student’s full face and their head and shoulders that was issued within the previous 10 years by the government, or a government authority, of: the Commonwealth or a state or territory; or a foreign country; or a state or province (however described) of a foreign country and that has not expired or been cancelled.

The student pilot must produce the document:

- before the student pilot’s next solo flight or
- seven days after the direction is given.

Recreational pilot licence

To hold a recreational pilot licence, you must be at least 16 years of age and have (CASR 61.475):

- passed the appropriate aeronautical knowledge examination and associated aircraft category rating
- completed appropriate flight training
- passed the recreational pilot licence flight test and
- at least 25 hours of flight time as pilot of the appropriate aircraft, including at least:
  - 20 hours of dual flight and
  - five hours of flight as pilot in command.
The privileges of a recreational pilot licence CASR 61.460
A recreational pilot licence authorises you to fly under VFR in private operations or flight training, as either pilot in command or co-pilot and in an aircraft that is:
- powered by a single engine that is not rocket or turbine powered
- not more than 1500 kg at maximum certified take-off weight
- single pilot certified
- carrying a maximum of one passenger.

The limitations on recreational pilot licence privileges CASR 61.465, CASR 61.470
To carry more than one passenger or to fly above 10,000 ft AMSL, either you or a person accompanying you must hold a current class 1 or 2 medical certificate (CASR 61.465).

There are four endorsements that you may undertake further training to acquire once you have obtained a recreational pilot licence (CASR 61.70, CASR 61.485 – 61.500):
- The recreational navigation endorsement allows you to fly:
  - beyond a 25 nm radius of the departure aerodrome
  - beyond the flight training area for that aerodrome
  - along a route between the aerodrome and the flight training area
  - cross country.
- The controlled airspace endorsement allows you to fly within controlled airspace.
- The controlled aerodrome endorsement allows you to fly at controlled aerodromes.
- The flight radio endorsement allows you to operate an aircraft radio.

Private pilot licence

CASR Part 61.H

What does a private licence (aeroplane) authorise a person to do? CASR 61.505
As the holder of a private licence (aeroplane) you are authorised to fly an aeroplane as pilot in command or co-pilot while the aeroplane is engaged in private operations or as pilot in command in flying training operations.
**Regular flight review requirement** CASR 61.400

If you hold a flight crew rating, such as a pilot rating or an aircraft type rating, you must complete periodic flight reviews that will assess your competency to perform the activity authorised by that rating. Glider pilot licences are also subject to periodic flight reviews.

Examples of ratings you may hold are:

- a class rating
- an aerial application rating
- an instructor rating
- an instrument rating or a private instrument rating
- a low level rating
- a night VFR rating
- a night vision imaging system rating.

**Recent experience requirements** CASR 61.395

You must not act as pilot in command carrying passengers by day unless you have carried out three take-offs and landings in the previous 90 days. If by day you are not carrying passengers there are no prescribed take off or landing recency requirements.

For a flight at night with passengers, you must have conducted three take-offs and landings at night in the previous 90 days. At night without passengers you must have conducted at least:

- one night take-off; and
- one night landing; within the previous 6 months in an aircraft of the same category.

You will be considered to have met the recent experience requirements to carry passengers by day if, in the last 90 days, you have successfully completed and passed a relevant flight check, review or test for a licence or rating, which included at least one take-off and landing. Similarly, if you wish to carry passengers by night, the above experience must have been conducted at night.

**Personal logbooks** CASR 61.345–CASR 61.365

As a holder of a pilot licence or certificate of validation, you must retain and maintain a personal logbook to a standard outlined in CASR 61.345. Accuracy of the information you enter into your logbook is paramount and is subject to auditing by CASA.

You must record your full name, date of birth and details of each flight you conduct in an aircraft or flight simulator.
Details of flights include:

- the date the flight began
- the aircraft (or simulator and simulated aircraft) type
- whether it was a single or multi-engine aircraft
- the aircraft’s nationality and registration
- the take-off and landing points and each segment of the flight
- the flight time (if any) flown in each of the following capacities
  - pilot in command
  - co-pilot
  - pilot in command under supervision
  - pilot receiving flight training
- whether the flight was by day or night, or both
- any instrument flight time
- whether you performed any instrument approaches and, if so, the type of instrument approach.

You need to retain your logbook for at least seven years after your last entry and you must ensure that it is unaltered within this time. Also, you must take due diligence that your logbook entries are not false or misleading.

You must produce your logbook if CASA asks and comply with this direction within seven days. Electronically formatted logbooks will need to be printed and each page certified as being ‘true copies’ (CASR 61.365).

If errors are discovered in your logbook, CASA may direct you to correct any errors and you are required to comply within 14 days (CASR 61.360).

**Production of licence documents, medical certificates and identification**

CASA 61.340

For a number of reasons, CASA may direct you to produce any or all of the following documents for inspection. You must comply immediately if you were exercising, about to exercise or had just finished exercising, the privileges of your licence, or within seven days in any other case:

- your pilot licence document
- any aviation medical certificates
- photo identification.
Pilot responsibilities

Pilot in command

Responsibility of pilot in command before flight CAR 233

As pilot in command, you must not commence a flight if you have not received evidence, and taken such action as is necessary to ensure that:

- the instruments and equipment required for the particular type of operation to be undertaken are installed in the aircraft and are functioning properly (see CAO 20.18 and GEN 1.5).

- the gross weight of the aircraft does not exceed the limitations fixed by or under CAR 235 and is such that flight performance in accordance with the standards specified by CASA for the type of operation to be undertaken is possible under the prevailing conditions (CAR 235, CAO 20.7.4)

- any directions of CASA for loading of the aircraft given under CAR 235 have been complied with (CAO 20.16.1, CAO 20.16.2 and CAO 20.16.3)

- the fuel quantity is sufficient for the particular flight (CAR 234, CAAP 234-1(1))

- the required operating and other crew members are on board and in a fit state to perform their duties

- applicable air traffic control instructions have been complied with

- the aircraft is safe for flight in all respects

- the latest of the aeronautical maps, charts and other aeronautical information and instructions, are carried in the aircraft and are readily accessible to the pilot.

A pilot in command must be designated CAR 224

For each flight the operator (owner, flying school, or hire organisation) must designate one pilot to act as pilot in command.

The pilot in command is responsible for:

- the start, continuation, diversion and end of the flight

- the operation and safety of the aircraft during flight

- the safety of persons and cargo carried on the aircraft (CAO 20.11, CAO 20.16)

- the conduct and safety of members of the crew.
As pilot in command, you must discharge these responsibilities in accordance with:

- any information, instructions or directions issued under the CAA, CAR or CASR
- the operations manual provided by the aircraft operator, if applicable.

You also have final authority as to the disposition of the aircraft while you are in command and for the maintenance of discipline by all persons on board.

**Powers of pilot in command** CAR 309

The pilot in command of an aircraft, with such assistance as is necessary and reasonable, may:

- take such action, including the removal of a person from the aircraft or the placing of a person under restraint or in custody, by force, as the pilot considers reasonably necessary to ensure compliance with the CAA, CAR or CASR in or in relation to the aircraft
- detain the passengers, crew and cargo for such period as the pilot considers reasonably necessary to ensure compliance with the CAA, CAR or CASR in, or in relation, to the aircraft.

A person who, on an aircraft in flight, whether within or outside Australian territory, is:

- found committing;
- reasonably suspected of having:
  - committed
  - attempted to commit
  - been about to commit

an offence against the CAA, CAR or CASR may be arrested, without warrant, by a member of the crew of the aircraft. This may be conducted in the same manner as a person who is found committing a felony may, at common law, be arrested by a constable and shall be dealt with in the same manner as a person so arrested by a constable.

**Restriction of advertising of commercial operations** CASR 117.010

A person must not give any public notice, by newspaper advertisement, broadcast statement or any other means of public announcement, to the effect that a person is willing to undertake by use of an Australian aircraft, any commercial operations unless the last-mentioned person has obtained an air operator’s certificate authorising the conduct of those operations.

**Note**—A simple interpretation—If you wish to advertise for a certain commercial operation (see CAR 206) in an Australian registered aircraft, you must hold an AOC authorising you to perform that commercial operation in that particular aircraft.
Classification of operations

**Private operations** CAR 2(7)(D)

The following are regarded as private operations:

- the personal transportation of the owner of the aircraft
- aerial spotting where the pilot, or the owner of the aircraft, receives no remuneration by any person or organisation on whose behalf the spotting is conducted
- agricultural operations on land owned and occupied by the owner of the aircraft
- aerial photography where no remuneration is received by the pilot or the owner of the aircraft or by any person or organisation on whose behalf the photography is conducted
- the carriage of persons or the carriage of goods without a charge for the carriage being made other than the carriage, for the purposes of trade, of goods being the property of the pilot, the owner or the hirer of the aircraft
- the carriage of persons, but not in accordance with a fixed schedule between terminals, provided that:
  - public notice of the flight has not been given by any form of public advertisement or announcement
  - the number of persons on the flight, including the operating crew, does not exceed six
  - no payment is made for the services of the operating crew
  - the persons on the flight, including the operating crew, share equally in the costs of the flight
  - no payment is required for a person on the flight other than the cost-sharing payment above
- the carriage of goods otherwise than for the purposes of trade
- flight training other than Part 141, Part 142 or balloon
- any other activity of a kind substantially similar to any of those specified above.
Carriage of persons

Carriage of passengers in seats at which dual controls are fitted
CAO 20.16.3 (11), CAR 228

In all aircraft for which the certificate of airworthiness specifies a minimum crew of one pilot, a person may occupy a seat at which fully or partially functioning dual controls are fitted. However, as the pilot, you must give adequate instruction to that person to ensure that the controls are not interfered with in flight and there is satisfactory communication available at all times between you and that person.

Unauthorised persons not to manipulate controls CAR 228

A person shall not manipulate the controls of an aircraft in flight unless the person is authorised under CASR Part 61 to pilot the aircraft.

Prohibition of carriage of passengers on certain flights CAR 249, CASR 141.295

The pilot in command of an aircraft that carries a passenger must not engage in:
- flying training given to a student pilot
- practice of emergency procedures in the aircraft
- low-flying practice or
- testing an aircraft or its components, power plant or equipment.

Intoxicated persons not to act as pilots or to be carried on aircraft CAR 256

A person shall not, while in a state of intoxication, enter any aircraft.

A person shall not act as a member of an operating crew or be carried for that purpose if their capacity to act is in any way impaired by the consumption or use of any alcoholic liquor, drug, pharmaceutical or medicinal preparation or other substance.

A person shall not act as, or perform any duties or functions preparatory to acting as, a member of the operating crew of an aircraft if the person has, during the period of eight hours immediately preceding the departure of the aircraft consumed any alcoholic liquor.

A person who is on board an aircraft as a member of the operating crew, or as a person carried in the aircraft for the purpose of acting as a member of the operating crew, shall not consume any alcoholic liquor.
Smoking in aircraft CAR 255

A person must not smoke:

- in a part of an aircraft in which a notice is permanently displayed indicating that smoking is prohibited at all times or without specifying a period during which smoking is prohibited or
- anywhere in an aircraft during take-off, landing or refuelling or during a period:
  - in which a notice is temporarily displayed indicating that smoking is prohibited or
  - which is specified in a permanently displayed notice as a period during which smoking is prohibited.

Offensive and disorderly behaviour CAR 256AA

A person in an aircraft must not behave in an offensive and disorderly manner.

Documents to be carried

Documents to be carried CAR 139, CAR 233

An Australian aircraft shall, when flying in Australian airspace, carry:

- unless CASA otherwise approves, its maintenance release and any other document approved for use as an alternative to the maintenance release
- unless CASA otherwise approves, the licences and medical certificates of the operating crew
- the flight manual (if any) for the aircraft, alternatively AOC holders may carry the operations manual (see CAR 139 (3)(a))
- latest editions of aeronautical, information and instructions applicable for the route or any alternative route that may be flown that is published in the AIP, or a data service provider, or by an organisation approved by CASA and which are readily accessible to the flight crew
- bills of lading and manifests with respect to any cargo.

Note—Electronic documents from an approved source cover this requirement.
Carriage of animals

**Carriage of animals** CAR 256A

The operator of an aircraft may not permit a live animal to be in the aircraft unless:

- the animal is in a container and is carried in accordance with this regulation or
- the animal is carried with the written permission of CASA and in accordance with any conditions specified in the permission.

The above does not apply to a dog accompanying a visually impaired or hearing impaired person as a guide or an assistant if the dog is:

- carried in the passenger cabin of the aircraft
- placed on a moisture-absorbent mat as near to the person as practicable
- restrained in a way that will prevent the dog from moving from the mat.

More than one animal must not be kept in the same container if doing so would be likely to adversely affect the safety of the aircraft.

A container must be so constructed that:

- an animal kept in the container cannot escape from the container
- any water or excreta in the container are not likely to escape from the container in normal flying conditions
- the container will withstand being damaged in a way that may allow an animal, or water or excreta, in the container to escape.

A container in which an animal is kept must not be in the passenger cabin of an aircraft.

An animal must be restrained in a container that is strong enough to withstand damage that may allow the animal to escape. The animal must also be restrained in a way that prevents an adverse effect on the load distribution of the aircraft.

An animal must not be carried on an aircraft if carrying the animal would be likely to adversely affect the safety of the aircraft.

In this regulation, animal means any member of the animal kingdom other than man.
Firearms

**Carriage of firearms** CAR 143

In private and aerial work operations, you must not carry a firearm in an aircraft without CASA’s written permission.

**Discharge of firearms in or from an aircraft** CAR 144

A firearm must not be discharged in, or from an aircraft, without CASA’s written permission to do so.

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**Passengers on board during refuelling** CAO 20.9 (4.2)

The aircraft operator must ensure that AVGAS is not loaded onto an aircraft while passengers are on board, or entering or leaving, the aircraft.

**Checking fuel and oils** CAO 20.9 (3)

The pilot in command of an aircraft shall ensure that the aircraft is not flown unless the:

- aviation fuel
- aircraft engine lubricating oil
- aircraft engine power augmentation fluid
- aircraft hydraulic system fluid

used in connection with the servicing or operation of the aircraft comply with the specification and grade required or approved for the purpose by CASA.

The pilot in command may assume that the above fluids already on the aircraft comply with the required specification and grade. All ground fuel stock shall be carefully checked for the presence of undissolved water before the fuelling operation is commenced. This precaution is particularly important when handling fuel from drum stocks.

The pilot in command must use a positive method, such as suitable water-detecting paste or paper, to test for the presence of free water, since sensory perceptions of colour and smell, if used alone, can be quite misleading.

In the case of turbine fuels, you must also watch for signs of cloudiness or other indication of the presence of suspended water droplets which will not necessarily be detected by a positive method.
**Location of aircraft** CAO 20.9 (4)

During refuelling, the aircraft and ground fuelling equipment shall be so located that no fuel tank filling points or vent outlets lie:

- within 5 m (17 ft) of any sealed building
- within 6 m (20 ft) of other stationary aircraft
- within 15 m (50 ft) of any exposed public area
- within 15 m (50 ft) of any unsealed building in the case of aircraft with a maximum take-off weight in excess of 5700 kg (12,566 lb)
- within 9 m (30 ft) of any unsealed building in the case of aircraft with a maximum take-off weight not exceeding 5700 kg (12,566 lb).

Apart from the above, limited fuelling operations for maintenance purposes may be carried out in certain hangars under certain conditions.

**Note**—The following operations are not deemed to constitute fuelling operations:

- the drainage of a small quantity of fuel from a fuel system drain point
- the transfer of fuel from tank to tank within an aircraft making use exclusively of lines and equipment permanently installed in the aircraft.

**Passengers on board during refuelling** CAO 20.9 (4.2)

The aircraft operator must ensure that AVGAS is not loaded onto an aircraft while passengers are on board, or entering or leaving, the aircraft.

**Aircraft safety precautions during fuelling operations** CAO 20.9 (4.3)

All engines in the aircraft, including any auxiliary power units, must be shut down.

When an external electrical supply is used, the connections between that supply and the aircraft electrical system shall be made and securely locked before the fuelling operation is connected and shall not be disconnected until the operation has been completed.
During refuelling operations, the pilot in command and the operator shall take reasonable steps to ensure that a person does not:

- operate or perform maintenance work on the aircraft’s radar equipment except that where the fuel is kerosene, operation or maintenance may be carried out provided the radar transmitter is deactivated
- except where the fuel involved is kerosene, carry out maintenance on any electrical, electronic or radio systems within the aircraft or operate such equipment other than the aircraft’s interior lighting or electrical apparatus necessary for the fuelling process.

The aircraft and all items of fuelling equipment (including drums, funnels and other loose items of equipment, where used) must connect in such a way as to ensure that they are of the same electrical potential. Also, where a suitable earth point is available at the fuelling site, both the aircraft and the equipment shall be effectively connected to that point.

Where the fuelling operation is performed by a barge to a seaplane, the barge shall be effectively connected to the aircraft in such a way as to ensure that the barge, the fuelling equipment and the aircraft are at the same electrical potential.

All footwear worn by aircraft-servicing personnel and persons operating fuelling equipment shall be of a non-sparking type and such persons shall not carry any matches, cigarette lighters or other objects which could represent an ignition hazard.

Except where automatic shut-off devices limit the capacity of an aircraft fuel tank, the operator and the pilot in command shall ensure that sufficient airspace remains in each fuel tank to allow for anticipated fuel expansion.

When aircraft refuelling is complete, the pilot in command and the operator of the aircraft shall ensure that all fuel and oil tank caps are securely refitted.

Aircraft oil tanks shall not be drained or filled when the aircraft is inside a hangar or other building unless the oiling equipment used complies with the provisions of Appendix I of CAO 20.9.

**Safety precautions external to an aircraft during fuelling operations**

CAO 20.9 (4.4)

The area in which fuelling operations are carried out shall be clearly placarded as a ‘no smoking’ area and the limits of this area shall be a sealed building, or at least 15 m (50 ft) from the aircraft or ground fuelling equipment. Where mobile fuelling equipment is used, the equipment shall be so placed that it can be rapidly moved in the event of fire.
During fuelling operations, the pilot in command and the operator shall take reasonable steps to ensure that a person does not:

- smoke or use a naked flame within 15 m (50 ft) of the aircraft and ground fuelling equipment
- operate an internal combustion engine or any electrical switch, battery, generator, motor or other electrical apparatus within 15 m (50 ft) of the aircraft’s fuel tank filling points or vent outlets, and ground fuelling equipment unless the engine, switch, generator, motor or apparatus complies with the provisions of Appendix I to CAO 20.9 and has been inspected.

Two or more fire extinguishers of approved type and capacity shall be positioned within 15 m (50 ft) but not less than 6 m (20 ft) from the aircraft and the fuelling equipment except where two or more fire extinguishers are carried on the fuelling equipment. Where so carried, the fire extinguishers must be fitted with quick release brackets, be readily available from either side of the equipment and be located as far as practicable from the vehicle fuel tanks and fuelling points.

**Action in the event of a fire hazard** CAO 20.9 (4.5)

A fuelling operation shall be suspended and the airport fire service notified when any fuel of a quantity likely to create a fire hazard is spilled on or within 15 m (50 ft) of the aircraft or ground fuelling equipment, including the bilge of a fuelling barge, and the operation shall not recommence until the fire hazard is removed.

A fuelling operation shall be stopped as soon as it becomes apparent that an infringement exists of any of the relevant requirements of CAO 20.9.

When any fuel of a quantity likely to create a fire hazard is spilled on or within 15 m (50 ft) of the aircraft or ground fuelling equipment, the pilot in command or, in his absence, the operator, shall ensure that:

- passengers on board—embarking or disembarking—are moved 15 m (50 ft) from spilled fuel.
- mobile power units, vehicles and power-operated loading devices operating within 15 m (50 ft) of the spilled fuel are shut down
- maintenance work of any nature on or within the aircraft is suspended and not recommenced until the spilled fuel has been removed.
Starting and running of engines CAR 230, CAO 20.9 (5)

A person must not start, or permit an aircraft engine to be run unless the engine is started or run when the control seat is occupied by an approved person or by a person who may fly the aircraft. This may include a pilot qualified to fly, or maintenance personnel qualified to work on, that type of aircraft. In any case, the person starting or taxiing the aircraft must have sufficient knowledge of the aircraft’s controls and systems to ensure the starting or running does not endanger any person or damage the aircraft (CAR 230 (3)).

Note—For taxiing, the person must be qualified under CASR Part 61 or Part 64.

The pilot in command—or in his absence any other person—responsible for starting or ground operation of an aircraft shall ensure that passengers are able to evacuate to safety from the aircraft. This is achieved by the following:

• for land aircraft—ensure that passenger loading equipment that will permit rapid evacuation of passengers and crew is kept immediately available during the starting of engines

• for seaplanes—ensure that water transport of a capacity sufficient to enable rapid evacuation of passengers and crew is immediately available during the starting of engines.

Where any fuel or other flammable material is spilled within 15 m (50 ft) of an aircraft, the aircraft engines shall not be started or operated until the fire hazard has been removed.

An aircraft engine shall not be started or operated:

• within 5 m (17 ft) of any sealed building

• within 8 m (25 ft) of other aircraft

• within 15 m (50 ft) of any exposed public area

• within 8 m (25 ft) of any unsealed building in the case of an aircraft with a maximum take-off weight not exceeding 5700 kg (12,566 lb).
Manipulation of propeller CAR 231

In spite of CAR 225 and CAR 230, the pilot in command of an aircraft which requires an operating crew of only one pilot may manipulate the propeller of the aircraft for the purposes of starting the aircraft if:

- assistance is not readily available for that purpose
- adequate provision is made to prevent the aircraft moving forward
- no one is on board the aircraft.

A person who is the holder of the certificate of registration for, or the operator, hirer or pilot in command of an Australian aircraft must not permit a person to manipulate the propeller of the aircraft to start the engine unless the first-mentioned person is satisfied that the person who is to manipulate the propeller knows the correct starting procedures for the aircraft and can manipulate the propeller safely.

Aircraft not to be taxied except by pilot CAR 229, CASR 64.045

It is an offence to taxi an aircraft if you are not qualified to do so. A person who is qualified to taxi an aircraft is one who is authorised under CASR Part 61 and Subpart 64.C. A person qualified to taxi an aircraft may include a holder of a pilot licence that is endorsed for that aircraft type, or a person approved by CASA to taxi the aircraft in accordance with agreed terms and conditions.

Pilots at controls CAR 225

The pilot in command must ensure that one pilot is at the controls of an aircraft from the time at which the engine or engines is, or are, started before a flight until the engine or engines is, or are, stopped after the termination of a flight.

When two or more pilots are required to be on board an aircraft, the pilot in command must ensure that two pilots remain at the controls at all times when the aircraft is taking off, landing and during turbulent conditions.
Seating

**Seat belts and safety harnesses** CAO 20.16.3, CAR 251
At least one pilot crew member must wear a seat belt or harness at all times during flight.

Except in the case of sick or injured persons (subsection 14) and parachutists (subsection 15), safety harnesses or seat belts shall be worn by all persons:
- during take-off and landing
- during an instrument approach
- unless CASA otherwise directs, when the aircraft is flying at a height of less than 1000 ft above the terrain
- at all times in turbulent conditions.

**Seat belts and safety harnesses** CAR 251
Adjust seat belts and safety harnesses to fit the wearer without slack.

**Adjustment of seats** CAO 20.16.3 (5)
Adjust all seats (with the exception of those specified in the paragraph below) to their upright position for take-off and landing.

If through illness or other incapacity a passenger’s seat remains in the reclined position during take-off or landing, that seat, notwithstanding the provision of the above, may be left reclined during take-off or landing if it is:
- forward facing
- there is no person occupying the seat immediately behind
- it will not impede the egress of any person in an emergency evacuation.

**Exits and passageways not to be obstructed** CAR 254
Unless CASA otherwise approves, this regulation applies to all passageways and exits in an aircraft that are for use by passengers or crew.

When an aircraft is in flight, the pilot in command must ensure that all passageways and exits to which this regulation applies are kept free from obstruction.

When an aircraft is in flight, the pilot in command must ensure that all exits to which this regulation applies are fastened in a way that permits their immediate use in an emergency.
Pre take-off

**Listening watch** CAR 243

When an aircraft is equipped with radio apparatus for use during flight, the pilot in command must maintain a listening watch—or must ensure that a listening watch is maintained—at all times commencing immediately prior to the time at which the aircraft commences to move on the manoeuvring area prior to flight. This will last until the aircraft is brought to a stop at the apron or other point of termination of the flight.

If communication between air traffic control and an aircraft under its control is a voice communication channel, the pilot in command and any other pilot for the time being operating the controls of the aircraft shall personally maintain a listening watch on the appropriate radio frequency.

**Movement on manoeuvring area** CAR 246

Immediately before take-off, the pilot in command shall manoeuvre the aircraft so that they are able to observe traffic on the manoeuvring area of the aerodrome and incoming and outgoing traffic, in order that they may avoid collision with other aircraft during the take-off.

**Safety precautions before take-off** CAR 244, CAO 20.2

Immediately before take-off on any flight, the pilot in command of an aircraft shall:

- test the flight controls on the ground to the full limit of their travel and make such other tests as are necessary to ensure that those controls are functioning correctly
- ensure that locking and safety devices are removed and that hatches, doors and tank caps are secured
- ensure that all external surfaces of the aircraft are completely free from frost and ice.

**Tests before and during the take-off run** CAR 245, CAR 138

CASA may give you directions specifying the tests you carry out as the pilot in command of an aircraft before the commencement of, and during, a take-off run in order to be satisfied that the engine and associated items of equipment are functioning correctly within the permissible limits of performance.
Before and during a take-off run, the pilot in command of an aircraft shall:
• carry out all tests required to be carried out in relation to the aircraft as above
• test all flight instruments, and, in particular, all gyroscopic flight instruments, that it is possible to test so as to ensure that they are functioning correctly
• ensure that all gyroscopic flight instruments are correctly set and uncaged
• perform such checks and tests as are required by the flight manual, or other document, for the aircraft.

If an inspection, check or test made under the above indicates any departure from the permissible limits or any malfunctioning in any particular (not being a departure or malfunctioning that is a permissible unserviceability), the pilot in command shall not commence the take-off or, if the pilot has commenced the take-off, shall abandon the take-off or take such other action as the pilot considers appropriate to ensure the safety of the aircraft and of those on board the aircraft.

**Pre-flight altimeter check** AIP ENR 1.7

A pre-flight altimeter check is required at sites of known elevation and where an accurate QNH is available. An example of a known elevation point is at the runway thresholds at an aerodrome with a published departure and approach (DAP) procedure as part of the AIP. This may be found on the Airservices website.

The VFR altimeter accuracy requirement is ±100 ft or 110 ft at sites above 3300 ft.

**Airservices**
www.airservicesaustralia.com
In flight

**Meteorological conditions observed en route** CAR 247

As pilot in command, you shall report—in the approved form and at such times as requested by a meteorological observer—the meteorological conditions observed en route.

When any meteorological condition that is hazardous to flight is encountered en route, you, as the pilot in command, shall report the condition as soon as possible, giving such details as appear important to the safety of other aircraft.

**Navigation logs** CAR 78

As pilot in command of an aircraft, you must keep a log of such navigational data as is required to enable you to determine the geographical position of the aircraft at any time while the aircraft is in flight.

**Acrobatic flight** CAR 155

You must not, as a pilot in command of an aircraft, fly the aircraft in acrobatic flight:

- at night
- if not in VMC
- of a particular kind unless the certificate of airworthiness, or the flight manual allows that kind of aerobatic manoeuvre
- over a populated area or public gathering.
Before engaging in acrobatic flight, you must ensure that:

- any loose articles are removed from the aircraft or made secure in the aircraft
- all locker and compartment doors of the aircraft are fastened
- the safety harness or seat belt of any vacant seat is made secure so as to avoid the fouling of the controls of the aircraft
- the dual controls (if any) are removed from the aircraft, or rendered inoperative, unless the control seats are occupied in accordance with CAR 226 or the dual control seat is vacant
- every person in the aircraft is secured with correctly adjusted safety harness or seat belt.

**Flying over public gatherings** CAR 156
Except with CASA’s written permission and in accordance with the conditions specified in the permit, an aircraft shall not be flown over any regatta, race meeting or public gathering.

Nothing in the above shall apply to an aircraft passing over a regatta, race meeting or public gathering in the process of:

- arriving at or departing from an aerodrome in the course of its normal navigation for so doing or
- passing from place to place in the ordinary course of navigation.

**Low flying** CAR 157, CASR Subpart 61Q, CASR 61.1040
The pilot in command of an aircraft must not fly the aircraft over:

- any city, town or populous area at a height lower than 1,000 feet or
- any other area at a height lower than 500 feet.

The height specified above is the height above the highest point of the terrain, and any object on it, within a radius of:

- in the case of an aircraft other than a helicopter—600 metres or
- in the case of a helicopter—300 metres;

from a point on the terrain vertically below the aircraft.

You must have at least a private pilot licence to hold a low-level rating. A low-level rating authorises you to conduct low-level operations under certain conditions.
Before flying any low-level operations, you must do a risk assessment of the proposed area. You must also hold the appropriate low-level endorsement for the type of low-level operation you wish to conduct (CASR 61.1050). There are nine low-level endorsements (CASR 61.1075):

- aeroplane
- helicopter
- powered-lift
- gyroplane
- aerial mustering-aeroplane
- aerial mustering-helicopter
- aerial mustering-gyroplane
- sling operations
- winch and rappelling operations.

**Recent experience requirements for low flying** CASR 61.1055

You are allowed to exercise the privileges of your low-level rating only if, within the last six months, you have:

- flown at least two hours of low-level operations or
- been assessed as competent to conduct low-level operations by a flight instructor who holds a low-level training endorsement or
- successfully completed within the previous six months
  - an operator proficiency check in low-level operations or
  - a flight review for the rating.

In addition, within the previous 24 months, you must also have (CASR 61.1060, CASA EX 48/17):

- completed a rating flight review; or
- passed a rating flight test; or
- passed an endorsement flight test, but more than six months after passing a flight test; or
- completed an aerial application proficiency check; or
- completed an operator proficiency check; or
- successfully taken part of an operator’s approved cyclic training and proficiency program that covers the rating.
**Reporting of failures, malfunctions, and defects** CAR 248, CASR 21.003, 42.270

At the termination of each flight, or in any urgent case, during the currency of the flight, you must report all defects in the aircraft, aerodromes, air routes, air route facilities or airway facilities which have come to your notice.

Where a defect in the aircraft is reported in accordance with the above paragraph, the operator of the aircraft shall take such action as required under the regulations (CAR 248).

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**Accidents and incidents**

**Introduction** AIP ENR 1.14

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The Bureau is managed by a Commission and is entirely separate from the transport regulators, policy makers and service providers.

The ATSB is established by the *Transport Safety Investigation Act 2003* (TSI Act) and conducts its investigations in accordance with the provisions of the Act. The TSI Act provides guidance for the investigation of all civil aviation occurrences within Australian Territory and for all occurrences involving civil registered Australian aircraft outside Australian Territory.

**Enquiries:** Australian Transport Safety Bureau, PO Box 967, Civic Square ACT 2608
T:1800 020 616  E: atsbinfo@atsb.gov.au
W: www.atsb.gov.au

**Reporting to the ATSB**

The items which a pilot must report are listed as either immediately reportable matters (IRM) or routinely reportable matters (RRM).

**Mandatory reporting—immediately reportable matters (IRM)**

IRMs are accidents and serious incidents that affect the safety of aircraft. These include matters involving death, serious injury or destruction or damage to the aircraft or to other property caused by the aircraft. IRMs must be reported to a nominated official by a responsible person as soon as reasonably practical.
Immediate reporting of IRMs is required under the TSI Act so that investigators can act quickly to preserve valuable evidence in order to determine the critical factors underlying serious occurrences.

An example of an IRM may include:

- a death or serious injury to a person caused by contact with an aircraft, aircraft component or jet blast
- an aircraft is believed missing
- an aircraft is suffering damage, or reasonable grounds exist for believing so
- a breakdown of separation standards (vertical, lateral or longitudinal) in CTA.

Mandatory reporting—routinely reportable matters (RRM)

RRMs do not require immediate reporting. RRMs are occurrences that have, or could have, affected safety, but the outcome was not serious. RRMs would involve non-serious injuries, minor aircraft damage or structural failure that does not significantly affect structural integrity, performance or flight characteristics and does not require major repair or replacement of affected components. Under the TSI Act, responsible person must report RRMs within 72 hours of becoming aware of them.

An example of a RRM may include (AIP ENR 1.14):

- an injury, other than a serious injury, to a person on board the aircraft
- a flight crew member becoming incapacitated while operating the aircraft
- an airprox
- an occurrence that results in difficulty controlling the aircraft, including any of the following:
  - an aircraft system failure
  - a weather phenomenon
  - operation outside the aircraft’s approved flight envelope
- fuel exhaustion
- the aircraft’s supply of useable fuel becoming so low (whether or not as a result of fuel starvation) that the safety of the aircraft is compromised
- a collision with an animal, or a bird, on a certified or registered aerodrome.
Mandatory reporting—contacting and submitting a report to the ATSB for immediately reportable matters (IRMs)

IRMs require immediate (as soon as practical) reporting by telephone and then a follow-up written report within 72 hours, preferably using the air safety incident report (ASIR) format.

RRMs only require a written report to be submitted within 72 hours.

Reporting
Australian Transport Safety Bureau
PO Box 967 Civic Square ACT 2608
Incident reporting hotline
T: 1800 011 034
To submit an online form:
www.atsb.gov.au/mandatory/asir-form

What to include in the report
These are outlined under AIP ENR 1.14, or go to
www.airservicesaustralia.com/aip/aip.asp

The minimum information required for a written report includes:

- aircraft make, model and registration
- names of the owner and operator
- full name of the pilot in command
- date and time of the accident
- last point of departure, point of intended landing and nature of the flight
- location of the accident
- number of persons on board and numbers and names of the injured
- nature and cause of the accident, as far as it is known
- description of damage to the aircraft
- description of the accident site’s terrain and its accessibility.
Voluntary reporting—aviation confidential reporting scheme (REPCON)

REPCON is a reporting system that allows people to submit reports to the ATSB in confidence. Maintaining individual confidentiality is the primary element of REPCON so as to, for example, alleviate the risk of any retribution. Any person who has an aviation safety concern, whether involved in the aviation industry or a member of the travelling public, may submit a REPCON report.

The items that are not reportable under the mandatory reportable scheme (e.g. IRMs and RRMs) but still exhibit evidence that gives reason for aviation safety related concerns should be reported with REPCON.

Examples of what should be reported with REPCON include:

- an incident or circumstance that affects, or has the potential to affect, aircraft operations safety
- a procedure, practice or condition that a reasonable person would consider endangers, or, if not corrected, would endanger, the safety of air navigation or aircraft operations, such as
  - in relation to aircraft operators, airport operators or ATC service providers
  - poor training, behaviour, attitudes
  - insufficient qualifications or experience of employees
- scheduling or rostering that contributes to the fatigue of employees and/or
- bypassing safety procedures because of operational or commercial pressures
  - inadequate airport facilities for safe operations
  - unsafe passenger, baggage or cargo management
  - inadequate traffic or weather information.

REPCON reporting

If you have any concerns, please contact REPCON confidential reporting:
T:1800 020 505.
Or submit an online form
Radio telephony procedures

General

**Introduction** AIP GEN 3.4

Use of standard phrases for radio telephony (RTF) communication between aircraft and ground stations is essential to avoid misunderstanding the intent of messages and to reduce the time required for communication.

Phraseologies that are most applicable to VFR operations contained in this section have been selected from AIP GEN 3.4. For a full list of phraseologies, please refer AIP GEN 3.4.

If no phraseology is available, clear and concise plain language should be used to indicate intentions.

**Language** CAR 184

English language must be used for all air-ground RTF communications within Australian FIRs unless use of an alternative language has been arranged with ATS prior to any specific flight.

**Symbol and parentheses conventions used** AIP GEN 3.4

Words in parentheses ‘( )’ indicate that specific information, such as a level, a place, a time, etc., must be inserted to complete the phrase, or alternatively, that optional phrases may be used. Words in square parentheses ‘[ ]’ indicate optional additional words or information that may be necessary in specific instances.

Phraseologies show the text of message components without callsigns. They are not intended to be exhaustive, and when circumstances differ, pilots, ATS, air defence and ground personnel will be expected to use appropriate subsidiary phraseologies. These should be clear, concise and designed to avoid any possible confusion.
For convenience the phraseologies are grouped according to types of air traffic service. However, users should be familiar with, and use as necessary, phraseologies from groups other than those referring specifically to the type of air traffic service being provided. All phraseologies must be used in conjunction with callsigns (aircraft, ground vehicle, ATC or other), as appropriate.

Phraseologies for the movement of vehicles, other than tow-tractors on the manoeuvring area, are not listed separately, as the phraseology associated with the movement of aircraft is applicable. The exception is for taxi instructions, in which case the word ‘proceed’ will be substituted for the word ‘taxi’ when ATC communicates with vehicles.

Words and phrases

**Transmission format** AIP GEN 3.4

When initiating a transmission to ATS, pilots must commence the transmission with the callsign of the unit being addressed, followed by the aircraft callsign. A read-back of an ATS message will be terminated with the aircraft’s callsign.

When making a broadcast at a non-controlled aerodrome or in Class E or G airspace, the transmission must commence with the location followed by ‘traffic’, for example ‘Bundaberg traffic’, and at the end of the transmission, the name of the location, that is ‘Bundaberg’.

**Read-back requirements** AIP GEN 3.4; ENR 1.1

Pilots must transmit a correct read-back of ATC clearances, instructions and information which are transmitted by voice. For other than the ATC route clearance, only key elements of the following clearances, instructions, or information must be read back ensuring sufficient detail is included to indicate compliance:

- an ATC route clearance in its entirety, and any amendments
  
  **Note**—’Rest of clearance unchanged’ is not required to be read back

- en-route holding instructions

- any route and runway-holding position specified in a taxi clearance

- any clearances, conditional clearances or instructions to hold short of, enter, land on, line-up on, wait, take-off from, cross, taxi or backtrack on, any runway

- any approach clearance
• assigned runway, altimeter settings directed to specific aircraft, radio and radio navigation aid frequency instructions

  **Note**—An *'expectation' of the runway to be used is not to be read back.*

• SSR codes, data link logon codes and

• Level instructions, direction of turn, heading and speed instructions.

  **Note**—Reported level figures of an aircraft should be preceded by the words *'flight level' when related to standard pressure and may be followed by the word *'feet' when related to QNH* (AIP GEN 3.4).

**Conditional clearances** AIP GEN 3.4

In all cases a conditional clearance will be given in the following order and consist of:

• identification (callsign)

• the condition (including position of the subject of the condition)

• the clearance and

• brief reiteration of the condition, for example

  **ATS:** ‘(aircraft callsign) behind A340 on short final, line up [runway (number)] behind’

  **Pilot:** ‘behind the A340, lining up [runway (number)] (aircraft callsign)’.

  (See AIP ENR 1.1)

**Route terminology** AIP GEN 3.4

The phrase *‘flight planned route’ may be used to describe any route or portion thereof that is identical to that filed in the flight notification with sufficient routing details given to definitely establish the aircraft on its route.*

**Amended route or level** AIP GEN 3.4

Whenever a situation arises whereby an aircraft, in the initial clearance, is cleared on a route and/or at a level other than that expected according to the flight notification, ATS will prefix the route and/or level details with the term *‘amended’ to alert the pilot that the clearance is different to that expected. For example:

**ATS:** ‘(aircraft callsign) cleared to (destination) [amended route] (route clearance details) [amended level] (level)’.
The prefix ‘amended’ will not be used:

- when an initial level for ATC traffic management purposes has been issued as part of an airways clearance to an aircraft departing an active CTR—in which case ‘maintain’ shall be used or
- during normal progressive climb/descent instructions.

When an issued airways clearance needs to be changed, ATS will prefix the new route and/or level details with the term ‘recleared’ to indicate to the pilot that a change has been made to the previous clearance and this new clearance supersedes the previous clearance or part thereof. The level will be stated in all clearance changes regardless of whether a change to the initially cleared level is made or not. For example:

**ATS:** ‘(aircraft callsign) recleared [to (destination)] [(route clearance details)] (level)’.

**Phonetic alphabet** AIP GEN 3.4

Radiotelephony pronunciation of the phonetic alphabet is as follows:

<table>
<thead>
<tr>
<th>Letter</th>
<th>Phonetic</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Alpha</td>
<td>al fah</td>
</tr>
<tr>
<td>B</td>
<td>Bravo</td>
<td>brah voh</td>
</tr>
<tr>
<td>C</td>
<td>Charlie</td>
<td>char lee or shar lee</td>
</tr>
<tr>
<td>D</td>
<td>Delta</td>
<td>dell tah</td>
</tr>
<tr>
<td>E</td>
<td>Echo</td>
<td>eck ho</td>
</tr>
<tr>
<td>F</td>
<td>Foxtrot</td>
<td>foks trot</td>
</tr>
<tr>
<td>G</td>
<td>Golf</td>
<td>golf</td>
</tr>
<tr>
<td>H</td>
<td>Hotel</td>
<td>ho tell</td>
</tr>
<tr>
<td>I</td>
<td>India</td>
<td>in dee a</td>
</tr>
<tr>
<td>J</td>
<td>Juliet</td>
<td>jew lee ett</td>
</tr>
<tr>
<td>K</td>
<td>Kilo</td>
<td>key loh</td>
</tr>
<tr>
<td>L</td>
<td>Lima</td>
<td>lee mah</td>
</tr>
<tr>
<td>M</td>
<td>Mike</td>
<td>mike</td>
</tr>
<tr>
<td>N</td>
<td>November</td>
<td>no vem bar</td>
</tr>
<tr>
<td>O</td>
<td>Oscar</td>
<td>oss cah</td>
</tr>
<tr>
<td>P</td>
<td>Papa</td>
<td>pah pah</td>
</tr>
<tr>
<td>Q</td>
<td>Quebec</td>
<td>keh beck</td>
</tr>
<tr>
<td>R</td>
<td>Romeo</td>
<td>row me oh</td>
</tr>
<tr>
<td>S</td>
<td>Sierra</td>
<td>see air rah</td>
</tr>
<tr>
<td>T</td>
<td>Tango</td>
<td>tang go</td>
</tr>
<tr>
<td>U</td>
<td>Uniform</td>
<td>you nee form</td>
</tr>
<tr>
<td>V</td>
<td>Victor</td>
<td>vik tah</td>
</tr>
<tr>
<td>W</td>
<td>Whiskey</td>
<td>wiss key</td>
</tr>
<tr>
<td>X</td>
<td>X-ray</td>
<td>ecks ray</td>
</tr>
<tr>
<td>Y</td>
<td>Yankee</td>
<td>yang key</td>
</tr>
<tr>
<td>Z</td>
<td>Zulu</td>
<td>zoo loo</td>
</tr>
</tbody>
</table>

**Note**—For pronunciation, syllables to be emphasised are in all capitals.
Numerals

Radiotelephony pronunciation of numbers shall be in the phonetic form as follows:

<table>
<thead>
<tr>
<th>Numeral</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>ZE-RO</td>
</tr>
<tr>
<td>1</td>
<td>WUN</td>
</tr>
<tr>
<td>2</td>
<td>TOO</td>
</tr>
<tr>
<td>3</td>
<td>TREE</td>
</tr>
<tr>
<td>4</td>
<td>FOW er</td>
</tr>
<tr>
<td>5</td>
<td>FIFE</td>
</tr>
<tr>
<td>6</td>
<td>SIX</td>
</tr>
<tr>
<td>7</td>
<td>SEV en</td>
</tr>
<tr>
<td>8</td>
<td>AIT</td>
</tr>
<tr>
<td>9</td>
<td>NIN er</td>
</tr>
</tbody>
</table>

Note—The syllables printed in capital letters in the above list are to be stressed.

Transmission of numbers AIP GEN 3.4

All numbers used in the transmission of altitude, cloud height, visibility and runway visual range (RVR) information, which contain whole hundreds and whole thousands, must be transmitted by pronouncing each digit in the numbers of hundreds or thousands followed by the word ‘hundred’ or ‘thousand’ as appropriate.

For example:

**Altitudes**
- 800 eight hundred
- 1500 one thousand five hundred
- 6715 six seven one five
- 10,000 one zero thousand

**Cloud height**
- 2200 two thousand two hundred
- 4300 four thousand three hundred

**Visibility**
- 200 two hundred
- 1500 one thousand five hundred
- 3000 three thousand

**Runway visual range**
- 700 seven hundred
All other numbers must be transmitted by pronouncing each digit separately. For example:

<table>
<thead>
<tr>
<th>Flight levels</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>FL180</td>
<td>flight</td>
<td>one eight zero</td>
</tr>
<tr>
<td></td>
<td>level</td>
<td>two zero zero</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Headings</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>one</td>
<td>five zero</td>
</tr>
<tr>
<td>080</td>
<td>zero</td>
<td>eight zero</td>
</tr>
<tr>
<td>300</td>
<td>three</td>
<td>zero zero</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wind direction</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>020°</td>
<td>zero</td>
<td>two zero degrees</td>
</tr>
<tr>
<td>100°</td>
<td>one</td>
<td>zero zero degrees</td>
</tr>
<tr>
<td>210°</td>
<td>two</td>
<td>one zero degrees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wind speeds</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>70 kt</td>
<td>seven</td>
<td>zero knots</td>
</tr>
<tr>
<td>18 kt, gusting 30</td>
<td>one eight</td>
<td>knots gusting three zero</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mach number</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.84</td>
<td>decimal</td>
<td>eight four</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altimeter setting</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>one</td>
<td>thousand</td>
</tr>
<tr>
<td>1027</td>
<td>one</td>
<td>zero two seven</td>
</tr>
</tbody>
</table>

**Note**—For the transmission of numbers in aircraft callsigns, refer to **Flight number callsigns** (see page 3.24).
### Standard words and phrases AIP GEN 3.4

The following words and phrases are to be used in radiotelephony communications, as appropriate, and have the meaning given:

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acknowledge</strong></td>
<td>Let me know that you have received and understood the message</td>
</tr>
<tr>
<td><strong>Affirm</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Approved</strong></td>
<td>Permission for proposed action granted</td>
</tr>
<tr>
<td><strong>Break</strong></td>
<td>I hereby indicate the separation between portions of the message (to be used where there is no clear distinction between the text and other portions of the message)</td>
</tr>
<tr>
<td><strong>Break break</strong></td>
<td>I hereby indicate separation between messages transmitted to different aircraft in a very busy environment</td>
</tr>
<tr>
<td><strong>Cancel</strong></td>
<td>Annul the previously transmitted clearance</td>
</tr>
<tr>
<td><strong>Check</strong></td>
<td>Examine a system or procedure (no answer is normally expected)</td>
</tr>
<tr>
<td><strong>Cleared</strong></td>
<td>Authorised to proceed under the conditions specified</td>
</tr>
<tr>
<td><strong>Confirm</strong></td>
<td>Have you correctly received the following…?</td>
</tr>
<tr>
<td><strong>Contact</strong></td>
<td>Establish radio contact with…</td>
</tr>
<tr>
<td><strong>Correct</strong></td>
<td>That is correct</td>
</tr>
<tr>
<td><strong>Correction</strong></td>
<td>An error has been made in this transmission (or message indicated). The correct version is…</td>
</tr>
<tr>
<td><strong>Disregard</strong></td>
<td>Consider that transmission as not sent</td>
</tr>
<tr>
<td><strong>How do you read</strong></td>
<td>What is the readability of my transmission?</td>
</tr>
<tr>
<td></td>
<td>The readability scale is:</td>
</tr>
<tr>
<td></td>
<td>1 Unreadable</td>
</tr>
<tr>
<td></td>
<td>2 Readable now and then</td>
</tr>
<tr>
<td></td>
<td>3 Readable but with difficulty</td>
</tr>
<tr>
<td></td>
<td>4 Readable</td>
</tr>
<tr>
<td></td>
<td>5 Perfectly readable</td>
</tr>
<tr>
<td><strong>I say again</strong></td>
<td>Repeat for clarity or emphasis</td>
</tr>
<tr>
<td><strong>Maintain</strong></td>
<td>Continue in accordance with the condition(s) specified, or in its literal sense, for example: ‘Maintain VFR’.</td>
</tr>
<tr>
<td><strong>Mayday Mayday</strong></td>
<td>My aircraft and its occupants are threatened by grave and imminent danger and/or I require immediate assistance</td>
</tr>
<tr>
<td><strong>Mayday</strong></td>
<td>Listen out on (frequency)</td>
</tr>
<tr>
<td><strong>Monitor</strong></td>
<td>Listen out on (frequency)</td>
</tr>
<tr>
<td><strong>Negative</strong></td>
<td>No</td>
</tr>
<tr>
<td>--------------</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>Permission is not granted</td>
</tr>
<tr>
<td></td>
<td>That is not correct</td>
</tr>
<tr>
<td><strong>Over</strong></td>
<td>My transmission is ended and I expect a response from you (not normally used in VHF communication)</td>
</tr>
<tr>
<td><strong>Out</strong></td>
<td>My transmission is ended and I expect no response from you (not normally used in VHF communication)</td>
</tr>
<tr>
<td><strong>Pan-pan</strong></td>
<td>I have an urgent message to transmit concerning the safety of my aircraft, or other vehicle or of some person on board, or within sight, but I do not require immediate assistance</td>
</tr>
<tr>
<td><strong>Pan-pan</strong></td>
<td>I have an urgent message to transmit concerning the safety of my aircraft, or other vehicle or of some person on board, or within sight, but I do not require immediate assistance</td>
</tr>
<tr>
<td><strong>Readback</strong></td>
<td>Repeat all, or the specified part, of this message back to me exactly as received</td>
</tr>
<tr>
<td><strong>Recleared</strong></td>
<td>A change has been made to your last clearance and this new clearance supersedes your previous clearance or part thereof</td>
</tr>
<tr>
<td><strong>Report</strong></td>
<td>Pass me the following information</td>
</tr>
<tr>
<td><strong>Request</strong></td>
<td>Should like to know or I wish to obtain</td>
</tr>
<tr>
<td><strong>Roger</strong></td>
<td>I have received all of your last transmission</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong>—Under no circumstances to be used in reply to a question requiring read back or a direct answer in the affirmative or negative</td>
</tr>
<tr>
<td><strong>Say again</strong></td>
<td>Repeat all or the following part of your last transmission</td>
</tr>
<tr>
<td><strong>Speak slower</strong></td>
<td>Reduce your rate of speech</td>
</tr>
<tr>
<td><strong>Standby</strong></td>
<td>Wait and I will call you</td>
</tr>
<tr>
<td><strong>Verify</strong></td>
<td>Check and confirm with originator</td>
</tr>
<tr>
<td><strong>Wilco</strong></td>
<td>Understand your message and will comply with it</td>
</tr>
<tr>
<td><strong>Words twice</strong></td>
<td><strong>As a request:</strong> Communication is difficult. Please send every word or group of words twice</td>
</tr>
<tr>
<td></td>
<td><strong>As information:</strong> Since communication is difficult every word or group of words in this message will be sent twice</td>
</tr>
</tbody>
</table>
SARTIME and SARWATCH

SARWATCH AIP GEN 3.4

SARTIME

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  SARTIME nomination</td>
<td>(a) SARTIME details</td>
</tr>
<tr>
<td></td>
<td>(b) Standby or (callsign)</td>
</tr>
<tr>
<td></td>
<td>(c) SARTIME FOR DEPARTURE (or ARRIVAL) [location] (time)</td>
</tr>
<tr>
<td>2  SARTIME cancellation</td>
<td>(a) SARTIME details</td>
</tr>
<tr>
<td></td>
<td>(b) Standby or (callsign)</td>
</tr>
<tr>
<td></td>
<td>(c) (position/location) CANCEL SARTIME</td>
</tr>
<tr>
<td>3  SARTIME amendment</td>
<td>(a) SARTIME details</td>
</tr>
<tr>
<td></td>
<td>(b) Standby or (callsign)</td>
</tr>
<tr>
<td></td>
<td>(c) As required, including specific phrases nominated above if applicable</td>
</tr>
</tbody>
</table>

SARWATCH other than SARTIME AIP GEN 3.4

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Departure reports</td>
<td>(a) AIRBORNE (location)</td>
</tr>
<tr>
<td>To initiate a SARWATCH when communication on the ground is not available</td>
<td></td>
</tr>
<tr>
<td>2  Flight and arrival reports</td>
<td>(a) (position) CANCEL SARWATCH [ADVISE (unit) if appropriate]</td>
</tr>
<tr>
<td>Form of acknowledgement to 'cancel SARWATCH' when the ATS unit accepting the arrival report is other than the unit addressed</td>
<td></td>
</tr>
<tr>
<td>(b) SARWATCH cancelled [wilco (unit)]</td>
<td></td>
</tr>
<tr>
<td>(c) [Location] SARWATCH terminated</td>
<td></td>
</tr>
<tr>
<td>(d) Roger (identity of unit acknowledging)</td>
<td></td>
</tr>
</tbody>
</table>

■ Pilot transmission  ▲ Military specific
### General phrases

**General phrases** AIP GEN 3.4

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Description of levels</strong>&lt;br&gt;Subsequently referred to as ‘(level)’</td>
<td>(a) Flight level (number) or&lt;br&gt;(b) (Number) [feet]</td>
</tr>
<tr>
<td><strong>2 Level instructions</strong>&lt;br&gt;When there is an expectation that the aircraft will maintain the level or to eliminate confusion, the instruction ‘and maintain’ shall be included</td>
<td>(a) Climb (or descend) followed as necessary by:&lt;br&gt;(i) to (level)&lt;br&gt;(ii) to and maintain (level)&lt;br&gt;(iii) to reach (level) at (by) (time or significant point)&lt;br&gt;(iv) to (level) report leaving (or reaching or passing or approaching) (level)&lt;br&gt;(v) at (number) feet per minute [minimum (or maximum)]</td>
</tr>
<tr>
<td>When rate is required to be in accordance with ‘standard rate’ specifications</td>
<td>(vi) at standard rate</td>
</tr>
<tr>
<td>When advising expectation of a level requirement</td>
<td>(b) Expect a requirement to reach (level) by (time or position) followed as necessary by (a)&lt;br&gt;(c) Step climb (or descent) (aircraft identification) above (or beneath) you&lt;br&gt;(d) Request level change from (name or unit) at (time or significant point)&lt;br&gt;(e) Stop climb (or descent) at (level)&lt;br&gt;(f) Continue climb (or descent) to [and maintain] (level)&lt;br&gt;(g) Expedite climb (or descent) [until passing (level)]&lt;br&gt;(h) Expect climb (or descent) at (time or location)</td>
</tr>
<tr>
<td>Pilot requesting a change of level</td>
<td>(i) REQUEST CLIMB (or descent) [at (time or location)] [to (level)]</td>
</tr>
<tr>
<td>To require action at a specific time or place</td>
<td>(j) Immediately&lt;br&gt;(k) After passing (significant point)&lt;br&gt;(l) At (time or significant point)</td>
</tr>
</tbody>
</table>

- Pilot transmission  ▲ Military specific
<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td>To require action when convenient</td>
<td>(m) When ready (instruction)</td>
</tr>
<tr>
<td>When a pilot is unable to comply with the clearance or instruction</td>
<td>(n) UNABLE TO COMPLY</td>
</tr>
<tr>
<td>When a descent clearance is issued in relation to the DME (or GNSS) steps</td>
<td>(o) Descend to (level) not below DME (or GNSS) steps</td>
</tr>
<tr>
<td>When a pilot is assigned and required to maintain separation with a sighted</td>
<td>(p) Maintain separation with (or pass behind or follow)</td>
</tr>
<tr>
<td>aircraft</td>
<td>(aircraft type or identification) [instructions or restriction]</td>
</tr>
</tbody>
</table>

| 4 Maintenance of specified levels                                            | (a) Maintain (level) [to (significant point)] [condition]                   |

| Note—the term ‘maintenance’ must not be used in lieu of ‘descend’ or ‘climb’|                                                                               |
| when instructing an aircraft to change level.                               |                                                                               |

| 5 Use of block levels                                                       | (a) REQUEST BLOCK LEVEL (level) to (level)                                  |
|                                                                             | (b) CLIMB (or descend) TO AND MAINTAIN BLOCK (level) TO (level)             |
|                                                                             | (c) Maintain block (level) to (level)                                       |
|                                                                             | (d) Cancel block clearance. Climb (or descend) to and maintain (level)      |

| 6 Specification of cruising levels                                          | (a) Cross (significant point) at (or above, or below) (level)               |
|                                                                             | (b) Cross (significant point) at (time) or later (or before) at (level)     |

| Reply to cruise climb request                                               | (c) Cruise climb not available [reason]                                    |

| 7 Where an aircraft operation requires random climb and descent at and      | (a) Operation not above (or below) (level)                                 |
| below (or at and above) a specified level                                  |                                                                               |

| 8 Termination of control services                                          | (a) Control service terminated [due (reason)]                              |

| 9 When instructing an aircraft to turn 180° or more when tracking           | (a) Turn left (or right)—I say again—left (or right) [tracking instructions]|
| instructions follow                                                        |                                                                               |

■ Pilot transmission ▲ Military specific
### Frequency management

**AIP GEN 3.4**

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Transfer of Control and/or Frequency Change</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Note</strong>—An aircraft may be requested to ‘standby’ on a frequency when the intention is that the ATS unit will initiate communication, and to ‘monitor’ a frequency when information is being broadcast thereon.</td>
<td>(a) Contact (unit callsign) (frequency)</td>
</tr>
<tr>
<td></td>
<td>(b) (FREQUENCY)</td>
</tr>
<tr>
<td></td>
<td>(c) At (or over) (time or place) contact (unit callsign) (frequency)</td>
</tr>
<tr>
<td></td>
<td>(d) If no contact (instructions)</td>
</tr>
<tr>
<td></td>
<td>(e) REQUEST CHANGE TO (frequency) (service)</td>
</tr>
<tr>
<td></td>
<td>(f) Frequency change approved</td>
</tr>
<tr>
<td></td>
<td>(g) REQUEST TO MAINTAIN RADIO SILENCE DUE (reason) [UNTIL (time)]</td>
</tr>
<tr>
<td></td>
<td>(h) Monitor (unit callsign) (frequency)</td>
</tr>
<tr>
<td></td>
<td>(i) MONITORING (frequency)</td>
</tr>
<tr>
<td></td>
<td>(j) Remain this frequency</td>
</tr>
<tr>
<td></td>
<td>(k) Stand by for (unit callsign) (frequency)</td>
</tr>
<tr>
<td>An IFR pilot changing to the CTAF frequency</td>
<td>(l) CHANGING TO (location) CTAF (frequency)</td>
</tr>
<tr>
<td>A pilot contacting next frequency when on a heading</td>
<td>(m) HEADING (as previously assigned)</td>
</tr>
<tr>
<td>When a pilot/ATC broadcasts general information</td>
<td>(n) ALL STATIONS (appropriate information)</td>
</tr>
<tr>
<td>When a pilot broadcasts location-specific general information</td>
<td>(o) (Location) TRAFFIC (appropriate information) (location)</td>
</tr>
</tbody>
</table>

**2 Flights contacting approach control**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Not radar identified or procedural tower</td>
<td>(a) (Distance) MILES [DME] [radial (VOR radial) or (compass quadrant from aerodrome, for example south/south east)] followed as necessary by:</td>
</tr>
<tr>
<td></td>
<td>(i) maintaining (or descending) to (level)</td>
</tr>
<tr>
<td>If visual approach can be made</td>
<td>(ii) visual</td>
</tr>
</tbody>
</table>

- Pilot transmission  ▲ Military specific
### Change of callsign

<table>
<thead>
<tr>
<th>To instruct an aircraft to change callsign</th>
<th>(a) Change your callsign to (new callsign) [until further advised]</th>
</tr>
</thead>
<tbody>
<tr>
<td>To advise an aircraft to revert to the callsign indicated in the flight notification to ATS</td>
<td>(b) Revert to flight plan callsign (callsign) [at (significant point)]</td>
</tr>
</tbody>
</table>

### After landing

| (a) Contact ground [frequency] |
| (b) *When vacated contact ground* [frequency] |

### To request a station relay a clearance or information to a third party

| (a) For [relay to] (third party callsign) (clearance or information) |

## Traffic information

### AIP GEN 3.4

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Traffic information</strong></td>
<td></td>
</tr>
<tr>
<td>Pilot request for traffic information</td>
<td>(a) REQUEST TRAFFIC</td>
</tr>
<tr>
<td>To pass traffic information</td>
<td>(b) No reported [IFR] traffic</td>
</tr>
<tr>
<td></td>
<td>(c) [IFR] traffic (relevant information) [report sighting]</td>
</tr>
<tr>
<td></td>
<td>(d) [additional] [IFR] traffic (direction) bound (type of aircraft)(level) estimated (or over [significant point) at (time)</td>
</tr>
<tr>
<td>To acknowledge traffic information</td>
<td>(e) LOOKING</td>
</tr>
<tr>
<td></td>
<td>(f) TRAFFIC IN SIGHT</td>
</tr>
<tr>
<td></td>
<td>(g) NEGATIVE CONTACT [reasons]</td>
</tr>
<tr>
<td>Interception of relevant traffic information transmitted by other aircraft or ATS facility</td>
<td>(h) COPIED (callsign of traffic intercepted)</td>
</tr>
<tr>
<td>Advice of military aircraft conducting abrupt vertical manoeuvres</td>
<td>Abrupt vertical manoeuvres at (position) up to (level)</td>
</tr>
<tr>
<td>Advice of military low jet operations known to be taking place</td>
<td>Military low jet operations (relevant information)</td>
</tr>
</tbody>
</table>

- Pilot transmission  ▲ Military specific
### Meteorological information

**AIP GEN 3.4**

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Meteorological conditions</strong></td>
<td>(a) [Threshold] wind (number) degrees (number) knots</td>
</tr>
<tr>
<td><strong>Note</strong>—Wind is always expressed by giving the mean direction and speed and any significant variations</td>
<td>(b) Wind at (height/altitude/flight level) (number) degrees (number) knots</td>
</tr>
<tr>
<td></td>
<td>(c) Wind at up-wind end (number) degrees (number) knots</td>
</tr>
<tr>
<td></td>
<td>(d) Visibility (distance) (direction)</td>
</tr>
<tr>
<td></td>
<td>(e) Runway visual range (RVR) or runway visibility (RV) [(runway (number)) (distance) (for RV assessments – assessed at time (minutes))]</td>
</tr>
<tr>
<td></td>
<td>(f) Present weather (details)</td>
</tr>
<tr>
<td></td>
<td>(g) Cloud (amount, [type] and height of base) (or sky clear)</td>
</tr>
<tr>
<td></td>
<td>(h) Cavok (<em>pronounced cav-oh-kay</em>)</td>
</tr>
<tr>
<td></td>
<td>(i) Temperature [minus] (number) (and/or dewpoint [minus] (number))</td>
</tr>
<tr>
<td></td>
<td>(j) QNH (number) [units]</td>
</tr>
<tr>
<td></td>
<td>(k) Moderate (or severe) icing (or turbulence) [in cloud] (area)</td>
</tr>
<tr>
<td>Unless responding to a request for turbulence or icing information</td>
<td>(l) Report flight conditions</td>
</tr>
<tr>
<td></td>
<td>(m) IMC (or VMC)</td>
</tr>
</tbody>
</table>

**Note**—For complete RVR phraseology refer GEN 3.4-42

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- Pilot transmission
- Military specific
### Reports and information AIP GEN 3.4

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Position reporting note:</strong> Phrases for use in enroute position and MET reports are listed in GEN 3.4.</td>
<td>(a) Next report at (significant point)</td>
</tr>
<tr>
<td><strong>2 Additional reports</strong></td>
<td></td>
</tr>
<tr>
<td>To request a report at a specified place or distance</td>
<td>(a) Report passing (significant point)</td>
</tr>
<tr>
<td></td>
<td>(b) Report [GNSS] (distance) from (name of DME station) DME (or reference point)</td>
</tr>
<tr>
<td></td>
<td>(c) Report passing (three digits) radial (name of VOR) VOR</td>
</tr>
<tr>
<td>To request a report of present position</td>
<td>(d) Report distance from (significant point)</td>
</tr>
<tr>
<td></td>
<td>(e) Report distance from (name of DME station) DME</td>
</tr>
<tr>
<td>When descending a non-DME equipped aircraft to LSALT above CTA steps</td>
<td>(f) Report passing control area steps for further descent</td>
</tr>
<tr>
<td>The pilot will give this only when satisfied that the CTA steps have been passed, allowing for navigational tolerances</td>
<td>(g) INSIDE (distance of a CTA step as shown on ERC) ■ miles</td>
</tr>
<tr>
<td><strong>3 Aerodrome information</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Runway (number) (condition)</td>
</tr>
<tr>
<td></td>
<td>(b) Landing surface (condition)</td>
</tr>
<tr>
<td></td>
<td>(c) Caution (work in progress) (obstruction) (position and any necessary advice)</td>
</tr>
<tr>
<td></td>
<td>(d) Breaking action reported by (aircraft type) at (time) good (or medium, or poor)</td>
</tr>
<tr>
<td></td>
<td>(e) Runway (or taxiway) wet (or damp, water patches, flooded (depth))</td>
</tr>
<tr>
<td><strong>4 Information to aircraft</strong></td>
<td></td>
</tr>
<tr>
<td>Wake turbulence</td>
<td>(a) Caution:</td>
</tr>
<tr>
<td>Jet blast on apron or taxiway</td>
<td>(i) wake turbulence</td>
</tr>
<tr>
<td>Propeller-driven aircraft slipstream</td>
<td>(ii) jet blast</td>
</tr>
<tr>
<td>Helicopter downwash</td>
<td>(iii) slipstream</td>
</tr>
<tr>
<td></td>
<td>(iv) downwash</td>
</tr>
<tr>
<td><strong>5 Pilot initiated waiver or wake turbulence separation standards</strong></td>
<td>(a) ACCEPT WAIVER</td>
</tr>
</tbody>
</table>

■ Pilot transmission   ▲ Military specific
# Clearances

## AIP GEN 3.4

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Clearances</td>
<td>(a) REQUEST CLEARANCE</td>
</tr>
<tr>
<td>If the route and/or level issued in the initial airways clearance is not in accordance with the flight plan.</td>
<td>(b) Cleared to (destination) [amended route] [route clearance details] [amended level] [level]</td>
</tr>
<tr>
<td>If an airways clearance is amended en route</td>
<td>(d) Recleared (amended clearance details) [rest of clearance unchanged] [level]</td>
</tr>
<tr>
<td>Where the clearance is relayed by a third party, for example pilot/flight watch (ATC excepted)</td>
<td>(f) (Name of unit) clears (aircraft identification)</td>
</tr>
<tr>
<td>When clearance will be issued subject to a delay</td>
<td>(g) Remain outside class (airspace class) [and (airspace class)] airspace and standby</td>
</tr>
<tr>
<td>When clearance will be issued at a specified time or place</td>
<td>(h) Remain outside class (airspace class) [and (airspace class)] airspace, expect clearance at (time/place)</td>
</tr>
<tr>
<td>When requesting a deviation from cleared route</td>
<td>(j) REQUEST TO DEVIATE UP TO (distance) MILES LEFT (or right) OF ROUTE DUE (reason)</td>
</tr>
<tr>
<td>When requesting a deviation from cleared track</td>
<td>(k) REQUEST TO DEVIATE UP TO (distance) MILES LEFT (or RIGHT) OF TRACK DUE (reason)</td>
</tr>
<tr>
<td>When a deviation from cleared route or track is requested</td>
<td>(l) Deviate up to (distance) miles left (or right) of route (or track)</td>
</tr>
<tr>
<td>When clearance cannot be issued</td>
<td>(m) Unable, traffic (direction) bound (type of aircraft) (level) estimated (or over) (significant point) at (time) callsign (callsign) advise intentions</td>
</tr>
<tr>
<td>When a weather deviation has been completed and onwards clearance is requested</td>
<td>(n) CLEAR OF WEATHER (request (route clearance))</td>
</tr>
<tr>
<td>When a weather deviation has been completed and the aircraft has returned to its cleared route</td>
<td>(o) BACK ON ROUTE (or TRACK)</td>
</tr>
</tbody>
</table>

- Pilot transmission
- Military specific
### Circumstance

When subsequent restrictions/requirements are imposed in addition to previous restrictions/requirements to be complied with

<table>
<thead>
<tr>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td>(p) Further restriction</td>
</tr>
<tr>
<td>(q) [Re]enter control area (or zone) [via (significant point)] at (level) [at (time)]</td>
</tr>
<tr>
<td>(r) Leave control area (or zone) at (level) (or climbing or descending)</td>
</tr>
<tr>
<td>(s) Leave and re-enter controlled airspace at (level) (or climbing to (level) or on (type of approach))</td>
</tr>
<tr>
<td>(t) Join (specify) at (significant point) at (level) [at (time)]</td>
</tr>
</tbody>
</table>

### 2 Indication of route and clearance limit

- **(a)** From (place) to (place)
- **(b)** To (place) **followed as necessary by:**
  - (i) direct
  - (ii) via (route and/or reporting points)
  - (iii) via flight planned route
  - (iv) via (distance) arc (direction) of (name of DME station) DME
- **(c)** (Level or route) not available due (reason) alternative(s) is/are (levels or routes) advise

Issuing a specific clearance limit

- **(d)** Clearance limit (places/aid)

When pilot requests, or ATC anticipates, a visual departure in lieu of a SID

- **(e)** [Clearance details] visual departure

### 3 When a clearance has been cancelled

- **(a)** Cancel clearance

### 4 Requesting clearance

- When notification of flight details had not been submitted to ATS
  - **(a)** FLIGHT DETAILS (INBOUND or FOR (DEPARTURE or transit))
- Flight details to be passed after ATS response
  - **(b)** (Aircraft type) (position) (route in controlled airspace and next estimated) (preferred level)
- If clearance cannot be issued immediately (upon request)
  - **(c)** Expect clearance at (time or place)
- If giving warning of clearance requirement
  - **(d)** EXPECT CLEARANCE REQUEST (aircraft type) VFR (if appropriate) for (destination) via (point outside controlled airspace at which clearance will be requested) estimate (estimate at destination) at (altitude proposed for entry to controlled airspace)

- Pilot transmission  ▲ Military specific
Approach and area control

Approach and area control services AIP GEN 3.4

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Departure instructions</strong></td>
<td>(a) Track (three digits) degrees [magnetic] to (or from) (significant point) [until (time) (or reaching) (fix or significant point or level)]</td>
</tr>
<tr>
<td><strong>2 Approach instructions</strong></td>
<td>(a) Cleared DME (or GPS) arrival [sector (identifying letter of the sector)]</td>
</tr>
<tr>
<td></td>
<td>(b) REQUEST [STRAIGHT-IN] (chart title) APPROACH</td>
</tr>
<tr>
<td></td>
<td>(c) Cleared straight-in (chart title) approach [followed by circling to runway (number)]</td>
</tr>
<tr>
<td></td>
<td>(d) Commence approach at (time)</td>
</tr>
<tr>
<td>Pilot to advise when able to conduct a visual approach</td>
<td>(e) Report visual</td>
</tr>
<tr>
<td></td>
<td>(f) Report runway [lights] in sight</td>
</tr>
<tr>
<td></td>
<td>(g) Report (significant point) [outbound or inbound]</td>
</tr>
<tr>
<td>Visual approach by night</td>
<td>(h) When established (position) cleared for visual approach</td>
</tr>
<tr>
<td><strong>3 Holding instructions</strong></td>
<td>(a) Hold visual [over] (position)</td>
</tr>
<tr>
<td>Published holding procedure over a waypoint, facility or fix</td>
<td>(b) Hold at (waypoint, facility or fix) (level) expect approach (or further clearance) at (time)</td>
</tr>
<tr>
<td>When pilot requires an oral description of holding procedures based on a facility</td>
<td>(c) REQUEST HOLDING INSTRUCTIONS</td>
</tr>
<tr>
<td></td>
<td>(d) Hold at (waypoint, facility or fix) (callsign and frequency, if necessary) (level) inbound track (three digits) degrees right (or left-hand) pattern, outbound time (number) minutes (additional instructions, if necessary)</td>
</tr>
<tr>
<td><strong>4 Expected approach time</strong></td>
<td>(a) No delays expected</td>
</tr>
<tr>
<td></td>
<td>(b) Expected approach time (time)</td>
</tr>
<tr>
<td><strong>5 To advise ATC of Minimum Fuel status</strong></td>
<td>(a) MINIMUM FUEL</td>
</tr>
<tr>
<td>ATC acknowledgment of Minimum Fuel status</td>
<td>(b) Minimum fuel acknowledged [no delay expected or expect (delay information)]</td>
</tr>
</tbody>
</table>

Note—Advice of fuel status must be made to each ATC sector on frequency transfer.
### Vicinity of the aerodrome – visual identification

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Identification of aircraft</td>
<td>(a) Show landing light</td>
</tr>
<tr>
<td>2 Acknowledgment by visual means</td>
<td>(a) Acknowledge by moving ailerons (or rudder)</td>
</tr>
<tr>
<td></td>
<td>(b) Acknowledge by rocking wings</td>
</tr>
<tr>
<td></td>
<td>(c) Acknowledge by flashing landing lights</td>
</tr>
</tbody>
</table>

### Starting and initial clearance issue

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Starting procedures</td>
<td>(a) [Aircraft location] REQUEST START</td>
</tr>
<tr>
<td>To request permission to start engines</td>
<td>(b) [Aircraft location] REQUEST START INFORMATION (ATIS identification)</td>
</tr>
<tr>
<td>ATC response</td>
<td>(c) Start approved</td>
</tr>
<tr>
<td></td>
<td>(d) Start at (time)</td>
</tr>
<tr>
<td></td>
<td>(e) Expect start at (time)</td>
</tr>
<tr>
<td></td>
<td>(f) Expect departure (time) start at own discretion</td>
</tr>
<tr>
<td>2 When clearance delivery is in operation</td>
<td>(a) (Flight number, if any) TO (aerodrome of first intended landing), REQUEST CLEARANCE</td>
</tr>
<tr>
<td>If runway other than runway nominated is required</td>
<td>(b) REQUIRE RUNWAY (number)</td>
</tr>
<tr>
<td>3 To request aerodrome data for departure</td>
<td>(a) REQUEST DEPARTURE INFORMATION</td>
</tr>
<tr>
<td>When no ATIS broadcast in available</td>
<td>(b) Runway (number), wind (direction and speed), QNH (detail) temperature (detail) [visibility for take-off (detail (or RVR) (detail)]</td>
</tr>
</tbody>
</table>

- ■ Pilot transmission
- ▲ Military specific
# Taxi procedures

**Taxi procedure** AIP GEN 3.4

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Taxi procedures</strong></td>
<td></td>
</tr>
<tr>
<td>For departure at a controlled aerodrome</td>
<td>(a) [Aircraft type] [POB (number)] [dual (or solo)] received (ATIS identification) [squawk (SSR code)] [aircraft location] [flight rules, if IFR] [to (aerodrome of destination)] REQUEST TAXI [intentions]</td>
</tr>
<tr>
<td>For departure at a non-controlled aerodrome</td>
<td>(b) (Aircraft type) [POB (number)] [IFR (if operating IFR)] TAXIING (location) FOR (destination or intentions) RUNWAY (number)</td>
</tr>
<tr>
<td>Where detailed taxi instructions are required</td>
<td>(c) [Aircraft type] REQUEST DETAILED TAXI INSTRUCTIONS</td>
</tr>
<tr>
<td>Where aerodrome information is not available from an alternative source such as ATIS</td>
<td>(d) Taxi via (specific routine to be followed) to holding point [identifier] [runway (number)] [time (minutes)]</td>
</tr>
<tr>
<td>Where aerodrome information is not available from an alternative source such as ATIS</td>
<td>(e) Holding point (identifier), runway (number)</td>
</tr>
<tr>
<td>For arrival at a controlled aerodrome</td>
<td>(f) Taxi to holding point [identifier] (followed by aerodrome information as applicable) [time (minutes)]</td>
</tr>
<tr>
<td>For arrival at a controlled aerodrome</td>
<td>(g) Holding point (identifier)</td>
</tr>
<tr>
<td>For arrival at a controlled aerodrome</td>
<td>(h) (Aircraft callsign) [parking area or bay number]</td>
</tr>
<tr>
<td>For arrival at a controlled aerodrome</td>
<td>(i) Taxi to [terminal or other location; for example general aviation area] [stand (number)]</td>
</tr>
</tbody>
</table>

- Pilot transmission  ▲ Military specific
### Taxi procedure AIP GEN 3.4

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2 Intersection departures</strong></td>
<td></td>
</tr>
<tr>
<td>When a pilot requests an intersection departure</td>
<td>(a) REQUEST INTERSECTION DEPARTURE FROM (taxiway identifier)</td>
</tr>
<tr>
<td></td>
<td>(b) Taxi to holding point (taxiway identifier) [runway (number)]</td>
</tr>
<tr>
<td>When a pilot is offered an intersection departure</td>
<td>(c) Intersection departure available from (taxiway identifier) (distance) remaining (if this information is not readily available to the pilot)</td>
</tr>
<tr>
<td></td>
<td>(d) Taxi to holding point (taxi identifier) [runway (number)]</td>
</tr>
<tr>
<td><strong>3 Specific routing</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Take (or turn) first (or second) left (or right)</td>
</tr>
<tr>
<td></td>
<td>(b) Taxi via (identification of taxiway)</td>
</tr>
<tr>
<td></td>
<td>(c) Taxi via runway (number)</td>
</tr>
<tr>
<td><strong>4 Manoeuvring on aerodrome</strong></td>
<td></td>
</tr>
<tr>
<td>Note—The pilot must, when requested, report “runway vacated” when the aircraft is well clear of the runway.</td>
<td>(a) REQUEST BACKTRACK</td>
</tr>
<tr>
<td></td>
<td>(b) Backtrack approved</td>
</tr>
<tr>
<td></td>
<td>(c) Backtrack runway (number)</td>
</tr>
<tr>
<td></td>
<td>(d) [Aircraft location] REQUEST TAXI TO (destination on aerodrome)</td>
</tr>
<tr>
<td></td>
<td>(e) Taxi straight ahead</td>
</tr>
<tr>
<td></td>
<td>(f) Taxi with caution (reason)</td>
</tr>
<tr>
<td></td>
<td>(g) Give way to (description and position of other aircraft or vehicle)</td>
</tr>
<tr>
<td></td>
<td>(h) GIVING WAY TO (traffic)</td>
</tr>
<tr>
<td></td>
<td>(i) Taxi into holding bay</td>
</tr>
<tr>
<td></td>
<td>(j) Follow (description of other aircraft or vehicle)</td>
</tr>
<tr>
<td></td>
<td>(k) Vacate runway</td>
</tr>
<tr>
<td></td>
<td>(l) RUNWAY VACATED</td>
</tr>
<tr>
<td></td>
<td>(m) Expedite taxi [reason]</td>
</tr>
<tr>
<td></td>
<td>(n) EXPEDITING</td>
</tr>
</tbody>
</table>

- Pilot transmission
- Military specific
# Aerodrome movements

## Circumstance

### 1. Holding

**Note**—The procedure words 'roger' and 'wilco' are insufficient acknowledgment of the instructions **hold, hold position** and **hold short of (position)**. In each case, the acknowledgment must be the phraseology **'holding'** or **'holding short'**, as appropriate.

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Holding</strong></td>
<td>(a) Hold (direction) of (position, runway number, etc)</td>
</tr>
<tr>
<td></td>
<td>(b) Hold position</td>
</tr>
<tr>
<td></td>
<td>(c) Hold short of (position)</td>
</tr>
<tr>
<td></td>
<td>(d) HOLDING</td>
</tr>
<tr>
<td></td>
<td>(e) HOLDING SHORT</td>
</tr>
</tbody>
</table>

### 2. To cross a runway

**Note**—If the control tower is unable to see the crossing aircraft (for example night, low visibility) the instruction should always be accompanied by a request to report when the aircraft has vacated and is clear of the runway.

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2 To cross a runway</strong></td>
<td>(a) [At (or on) (location)] REQUEST CROSS RUNWAY (number)</td>
</tr>
<tr>
<td></td>
<td>(b) [At (or on) (location)] cross runway (number) [report vacated]</td>
</tr>
<tr>
<td></td>
<td>(c) At (or on) (location) CROSSING RUNWAY (number)</td>
</tr>
<tr>
<td></td>
<td>(d) Expedite crossing runway (number) traffic (aircraft type) (distance) miles final</td>
</tr>
</tbody>
</table>

### 3. To enter a runway: (not used in conjunction with clearance to line-up or enter the Operational Readiness Platform). (see note above)

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3 To enter a runway</strong></td>
<td>(a) [AT (or ON) (location)] REQUEST ENTER RUNWAY (number)</td>
</tr>
<tr>
<td></td>
<td>(b) At (or on) (location) enter runway (number) [report vacated]</td>
</tr>
<tr>
<td></td>
<td>(a) AT (or ON) (location) ENTER RUNWAY (number)</td>
</tr>
</tbody>
</table>

#### Pilot transmission ▲ Military specific
Runway operations AIP GEN 3.4

**Note**—During multiple runway operations where the possibility of confusion exists, the runway number will be stated. The runway number may be stated if the caller wishes to emphasise the runway to be used. For parallel runway operations on discrete frequencies, at Class D aerodromes, the runway number may be omitted.

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Preparation for take-off</strong></td>
<td></td>
</tr>
<tr>
<td>When reporting ready for operations wholly within Class D CTR or departure from Class D CTR not in receipt of airways clearance for operations outside Class D airspace</td>
<td>(a) Report when ready [for departure] ready [for circuits] [via (published departure route, circuit leg for departure or first tracking point)]</td>
</tr>
<tr>
<td></td>
<td>(b) Are you ready for immediate departure?</td>
</tr>
<tr>
<td></td>
<td>(c) READY</td>
</tr>
<tr>
<td><strong>2 Clearance to enter runway and await take-off</strong></td>
<td></td>
</tr>
<tr>
<td>When the pilot desires to enter the runway and assume take-off position for checks before departure</td>
<td>(a) REQUEST LINE-UP [require (required number of seconds delays in lined-up position before departure) seconds on runway]</td>
</tr>
<tr>
<td></td>
<td>(b) Line up [and wait] [runway (number)] [be ready for immediate departure]</td>
</tr>
<tr>
<td>Conditional clearances</td>
<td>(c) (Condition) line up [runway (number)] (brief reiteration of condition)</td>
</tr>
<tr>
<td>Acknowledgment of a conditional clearance</td>
<td>(d) (Condition) LINING UP [runway (number)]</td>
</tr>
<tr>
<td><strong>3 Take-off clearance</strong></td>
<td></td>
</tr>
<tr>
<td>Multiple runway operations, other than Class D aerodromes where aircraft are operating on parallel runways using discrete frequencies</td>
<td>(a) Cleared for take-off [report airborne]</td>
</tr>
<tr>
<td>When take-off clearance has not been complied with</td>
<td>(b) Runway (number) cleared for take-off</td>
</tr>
<tr>
<td></td>
<td>(c) Take off immediately or vacate runway</td>
</tr>
<tr>
<td></td>
<td>(d) Take off immediately or hold short of the runway</td>
</tr>
<tr>
<td>When LAHSO are in use</td>
<td>(e) (Aircraft type) LANDING ON CROSSING RUNWAY WILL HOLD SHORT—RUNWAY (number) CLEARED FOR TAKE-OFF</td>
</tr>
<tr>
<td>Radar departure</td>
<td>(f) Assigned heading right (or left) (three digits) (plus any altitude restriction) [runway (number)] cleared for take-off</td>
</tr>
<tr>
<td></td>
<td>(g) Left (or right) (three digits) (plus any altitude restriction) runway (number) cleared for take-off</td>
</tr>
</tbody>
</table>

- Pilot transmission  ▲ Military specific
### Circumstance | Phraseology
--- | ---
(h) Assigned heading (degrees) [runway (number)] cleared for take-off
(i) HEADING (three digits) [runway (number)] CLEARED FOR TAKE-OFF

### 4 Take-off clearance cancellation

| Phraseology | 
| --- | --- |
| (a) Hold position, cancel, I say again, cancel take-off (reason) |  
| (b) HOLDING |  
| (c) Stop immediately (repeat aircraft callsign) stop immediately |  
| (d) STOPPING RUNWAY (number) |  

## After take-off

### After take-off AIP GEN 3.4

### Notes

1. All ‘level’ reports to radar must be to the nearest 100 ft

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
</table>
| 1 Tracking after take-off | (a) REQUEST RIGHT (or left) TURN [when airborne]  
(b) Left (or right) turn approved  
(c) After passing (level) (instructions)  
(d) Continue on (magnetic direction of runway) (instructions)  
(e) Track (magnetic direction of runway) (instructions)  
(f) Climb straight ahead (instructions) |
| Heading to be followed |  
| When a specific track is to be followed |  
| 2 Airborne report – radar |  
| Where an ATS surveillance service is provided unrestricted turn to track (including SID) | (a) PASSING (level) climbing to (level) |

Pilot transmission ▲ Military specific
<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heading specified by ATC</td>
<td>(b) TURNING LEFT (or right) PASSING (level) (CLIMBING TO (level)), or</td>
</tr>
<tr>
<td></td>
<td>(c) MAINTAINING RUNWAY HEADING PASSING (level) CLIMBING TO (level)</td>
</tr>
<tr>
<td>When assigned heading approximates runway bearing</td>
<td>(d) HEADING (three digits) PASSING (level) CLIMBING to (level)</td>
</tr>
</tbody>
</table>

3  Departure report – non-radar

<table>
<thead>
<tr>
<th>When notifying departure report to a control tower</th>
<th>(a) TRACKING (track being flown) [from (reference aid used to establish track) or via SID (identifier)] climbing to (level) ESTIMATING (first reporting point) at (time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-controlled aerodromes—non-surveillance</td>
<td>(b) Departed (location) (time in minutes) tracking [to intercept] (track) climbing to (intended level) estimating (first reporting point) at (time)</td>
</tr>
<tr>
<td>Non-controlled aerodromes—surveillance when notifying departure and identification is expected with the departure report</td>
<td>(c) (Location reference departure aerodrome) passing (current level) climbing to (intended level) estimating (first reporting point) at (time)</td>
</tr>
</tbody>
</table>
## Arrival at aerodrome

### AIP GEN 3.4

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Entering an aerodrome traffic circuit</strong></td>
<td>(a) [Aircraft type] (position) (level) (intentions)</td>
</tr>
<tr>
<td>When ATIS information is available</td>
<td>(b) [Aircraft type] (position) (level) INFORMATION (ATIS identification) (intentions)</td>
</tr>
<tr>
<td></td>
<td>(c) Join (instruction) runway (number) QNH (detail) [traffic (detail)] [track (requirements)]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2 In the circuit</strong></td>
<td>(a) (Position in circuit, for example DOWNWIND/FINAL)</td>
</tr>
<tr>
<td>Note—The report “LONG FINAL” is made when aircraft turn on to final approach at a distance greater than 4NM from touchdown or when an aircraft on a straight-in approach is 8NM from touchdown. In both cases, a report “FINAL” is required at 4NM from touchdown.</td>
<td>(b) (Position in circuit, for example DOWNWIND/FINAL) [GLIDE APPROACH, FLAPLESS APPROACH]</td>
</tr>
<tr>
<td></td>
<td>(c) Number (sequence number) follow (aircraft type and position) [additional instructions if required]</td>
</tr>
<tr>
<td></td>
<td>(d) Overfly ([circuit direction] runway (number) ([level]) [QNH (detail)] [traffic (detail)] [track (requirements)])</td>
</tr>
<tr>
<td>Nearing position at which approach must be aborted if not cleared to land</td>
<td>(e) BASE (or crosswind)</td>
</tr>
<tr>
<td></td>
<td>(f) FINAL (or long final)</td>
</tr>
<tr>
<td></td>
<td>(g) SHORT FINAL</td>
</tr>
<tr>
<td>Abnormal operations / doubt exists</td>
<td>(h) Check gear down (and locked)</td>
</tr>
<tr>
<td>Note—When doubt exists as to whether the gear is fully extended, or when a general aviation aircraft with retractable undercarriage has experienced abnormal operations</td>
<td>(i) (Readback) GEAR DOWN (and locked)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3 Approach instructions</strong></td>
<td>(a) Make short approach</td>
</tr>
<tr>
<td></td>
<td>(b) Make long approach (or extend downwind)</td>
</tr>
<tr>
<td></td>
<td>(c) Report base (or final or long final)</td>
</tr>
<tr>
<td></td>
<td>(d) Continue approach</td>
</tr>
</tbody>
</table>

- Pilot transmission  ▲ Military specific
<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4  Landing</strong></td>
<td>(a) Cleared to land (or touch and go) (or stop and go)</td>
</tr>
<tr>
<td></td>
<td>Multiple runway operations, other than Class D aerodromes where aircraft are operating on parallel runways using discrete frequencies</td>
</tr>
<tr>
<td></td>
<td>(b) Runway (number) cleared to land (or touch and go) (or stop and go)</td>
</tr>
<tr>
<td></td>
<td>Where the aircraft cannot be sighted by ATC (c) [Runway (number)] not in sight—cleared to land</td>
</tr>
<tr>
<td></td>
<td>Pilot requesting option for touch and go, full stop, stop and go, or go-around (d) (Position in circuit) REQUEST (the option)</td>
</tr>
<tr>
<td></td>
<td>Advising the pilot of the option to touch and go, full stop, stop and go, or overshoot (e) [Runway (number)] cleared for (the option)</td>
</tr>
<tr>
<td></td>
<td>Where ATC require the aircraft to make a full stop landing (f) Make full stop (reason) cleared to land</td>
</tr>
<tr>
<td><strong>5  When landing approved and LAHSO are in use</strong></td>
<td>(a) (Aircraft type) departing (or landing) on crossing runway, hold short runway (number) cleared to land runway (number)</td>
</tr>
<tr>
<td></td>
<td>Required readback (b) HOLD SHORT RUNWAY (number) CLEARED TO LAND runway (number)</td>
</tr>
<tr>
<td></td>
<td>When the full length of the landing runway subsequently becomes available (c) Full runway length now available Note—The hold short lights will remain illuminated even though the full length of the runway is available</td>
</tr>
<tr>
<td></td>
<td>Where an aircraft operating on a flight number callsign cannot participate in LAHSO (d) (Callsign) NEGATIVE (active and/or passive) LAHSO</td>
</tr>
<tr>
<td><strong>6  Delaying aircraft</strong></td>
<td>(a) Orbit right (or left) [from present position]</td>
</tr>
<tr>
<td><strong>7  Pilot request for low approach or pass</strong></td>
<td>(a) REQUEST LOW APPROACH (reasons)</td>
</tr>
<tr>
<td></td>
<td>To make an approach above a runway, descending to an agreed minimum level (b) Cleared low approach [runway (number)] [(altitude) restriction] [(go-around instructions)]</td>
</tr>
<tr>
<td></td>
<td>To fly past the control tower or other observation point for the purpose of visual inspection by persons on the ground (c) REQUEST LOW PASS (reasons)</td>
</tr>
<tr>
<td></td>
<td>(d) Cleared low pass [runway (number)] [(altitude restriction) [(go-around instructions)]</td>
</tr>
<tr>
<td><strong>8  Missed approach</strong></td>
<td>(a) go around [track extended centreline (three digits) degrees (or instructions)]</td>
</tr>
<tr>
<td></td>
<td>To discontinue an approach (b) GOING AROUND</td>
</tr>
<tr>
<td></td>
<td>Multiple runway operations (c) GOING AROUND RUNWAY (number)</td>
</tr>
</tbody>
</table>

- Pilot transmission  ▲ Military specific
## ATS Surveillance Service Phraseologies

### General phrases AIP GEN 3.4

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Identification of aircraft</td>
<td></td>
</tr>
</tbody>
</table>
(a) Report heading [and flight level (or altitude)]
(b) For identification turn left (or right) heading (three digits)
(c) Identified [(position)]
(d) Not identified [reason] [resume (or continue) own navigation] |
| 2 Termination of ATS surveillance services | 
(a) Identification terminated [due to (reason)] [(instructions)] [frequency changed approved]
(b) Will shortly lose identification (appropriate instructions or information)
(c) Identification lost [reasons] [(instructions)] |
| 3 ATS surveillance system position information | 
To request traffic, position and/or navigation information |
(a) REQUEST: 
(i) ATS SURVEILLANCE ASSISTANCE (reason) 
(ii) POSITION BY RADAR [with reference to (aid or location)] 
(iii) TRAFFIC (or position or navigation) ADVISORY [by surveillance] 
(iv) FLIGHT FOLLOWING |
| To request ongoing SIS | 
(v) (SPECIFIC ATC SURVEILLANCE SERVICES) |
| To terminate an ongoing SIS | 
(b) CANCEL FLIGHT FOLLOWING 
(c) Position (distance) (direction) of (significant point) (or over or abeam (significant point)) |
| To advise the aircraft’s SSR or ADS-B capability | 
(a) TRANSPONDER (ALPHA, CHARLIE or SIERRA as shown in the Flight Plan) 
(b) ADS-B TRANSMITTER [TEN NINETY DATALINK] 
(c) ADS-B RECEIVER [TEN NINETY DATALINK] 
(d) NEGATIVE TRANSPONDER |

- Pilot transmission  ▲ Military specific
ATS surveillance service communication and navigation

AIP GEN 3.4

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Communications</strong></td>
<td>(a) [If] radar contact lost (instructions)</td>
</tr>
<tr>
<td></td>
<td>(b) If no transmissions received for (number) minutes (or seconds) (instructions)</td>
</tr>
<tr>
<td></td>
<td>(c) Reply not received (instructions)</td>
</tr>
<tr>
<td>If loss of communications is suspected</td>
<td>(d) If you read manoeuvre instructions or squawk (code or ident)</td>
</tr>
<tr>
<td></td>
<td>(e) (Manoeuvre or squawk) observed, position (position of aircraft), will continue to pass instructions</td>
</tr>
<tr>
<td><strong>2 Aircraft directional indicator failure</strong></td>
<td>(a) ATS surveillance service will continue make all turns rate one (or rate half or (number) degrees per second execute instructions immediately upon receipt</td>
</tr>
<tr>
<td>Notify pilot of intention to use directional indicator failure procedures</td>
<td>(b) Confirm heading</td>
</tr>
<tr>
<td>When suspected by ATC</td>
<td>(c) Suspect your compass has failed, radar service will continue using no-compass procedures, confirm familiar</td>
</tr>
<tr>
<td>If heading response appears at variance with the track of the radar return</td>
<td>(d) Turn left (or right) now</td>
</tr>
<tr>
<td></td>
<td>(e) Stop turn now</td>
</tr>
</tbody>
</table>

**ATS surveillance system manoeuvres** AIP GEN 3.4

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 General manoeuvres</strong></td>
<td>(a) Leave (significant point) heading (three digits) [inbound] [at (time)]</td>
</tr>
<tr>
<td></td>
<td>(b) Continue heading (three digits)</td>
</tr>
<tr>
<td></td>
<td>(c) Continue present heading</td>
</tr>
<tr>
<td></td>
<td>(d) Fly heading (three digits)</td>
</tr>
<tr>
<td></td>
<td>(e) Turn left (or right) (number) degrees (or heading (three digits) [reason])</td>
</tr>
</tbody>
</table>

- Pilot transmission   ▲ Military specific
### Circumstance

When instructing an aircraft to turn 180° or more and in order to emphasise the direction of turn

When necessary to specify a reason for a manoeuvre, the following phraseologies should be used

<table>
<thead>
<tr>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td>(f) Orbit left (or right) [reason]</td>
</tr>
<tr>
<td>(g) Climb (or descend) to (level) visual</td>
</tr>
<tr>
<td>(h) Turn left (or right) (number) degrees (or heading (three digits)) [climb (or descend) to (level)] visual</td>
</tr>
<tr>
<td>(i) Stop turn heading (three digits)</td>
</tr>
<tr>
<td>(j) Turn left (or right)—I say again—left (or right) heading (three digits) [reason]:</td>
</tr>
<tr>
<td>(i) due traffic</td>
</tr>
<tr>
<td>(ii) for spacing</td>
</tr>
<tr>
<td>(iii) for delay</td>
</tr>
<tr>
<td>(iv) for downwind (or base, or final)</td>
</tr>
</tbody>
</table>

### Aircraft vectoring by ATS surveillance services

(a) REQUEST VECTORS [to (or from) (aid, location or reason)]

(b) Do you want vectors?

To transfer responsibility to the pilot for navigation and terrain clearance (as applicable) on termination of vectoring

(c) Resume own navigation (position of aircraft) (specific instructions)

### Speed control

#### AIP GEN 3.4

### Circumstance

#### 1 Speed

**Note**—All speed communications shall relate to **indicated airspeed** unless otherwise stipulated. Where applicable, **Mach number** may be nominated as the unit of speed statement.

<table>
<thead>
<tr>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) SPEED (number) KNOTS (or Mach number)</td>
</tr>
<tr>
<td>(b) Report speed or ([climb or cruise] Mach number)</td>
</tr>
<tr>
<td>(c) Maintain (number) knots (or Mach (number)) [or greater (or less)] [until (location)]</td>
</tr>
<tr>
<td>(d) Maintain present speed</td>
</tr>
<tr>
<td>(e) Increase (or reduce) speed to (or by) (number) knots</td>
</tr>
<tr>
<td>(f) Reduce to minimum approach speed</td>
</tr>
<tr>
<td>(g) Cross (significant point) [at (time)] [at (number) knots]</td>
</tr>
</tbody>
</table>
### Traffic information

**AIP GEN 3.4**

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Traffic Information</strong></td>
<td>(a) Traffic (number) o’clock (distance) (direction of flight) [any other pertinent information]</td>
</tr>
<tr>
<td></td>
<td>(i) unknown</td>
</tr>
<tr>
<td></td>
<td>(ii) slow moving</td>
</tr>
<tr>
<td></td>
<td>(iii) fast moving</td>
</tr>
<tr>
<td></td>
<td>(iv) closing</td>
</tr>
<tr>
<td></td>
<td>(v) opposite (or same) direction</td>
</tr>
<tr>
<td></td>
<td>(vi) overtaking</td>
</tr>
<tr>
<td></td>
<td>(vii) crossing left to right (or right to left)</td>
</tr>
<tr>
<td>Aircraft type to be passed if known</td>
<td>(viii)(type)</td>
</tr>
<tr>
<td></td>
<td>(ix) (level)</td>
</tr>
<tr>
<td></td>
<td>(x) climbing (or descending)</td>
</tr>
<tr>
<td></td>
<td>(b) Clear of traffic [appropriate instructions]</td>
</tr>
</tbody>
</table>

- Pilot transmission
- Military specific
## Secondary surveillance radar

### Secondary surveillance radar SSR and ADS-B

### AIP GEN 3.4

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 To instruct setting of transponder</strong></td>
<td>(a) Squawk (code) [and ident if required]</td>
</tr>
<tr>
<td><strong>Note</strong>—The word ‘code’ is not used in transmissions.</td>
<td>(b) [SQUAWK] (code) [AND IDENT if instructed by ATS]</td>
</tr>
<tr>
<td><strong>Note</strong>—ADS-B and SSR are linked in many aircraft and terminating one will terminate the other.</td>
<td>(c) Squawk normal</td>
</tr>
</tbody>
</table>

To request:

- Reselection of the assigned mode and code: (d) Recycle [(mode)] (code)
- Reselection of aircraft identification: (e) RECYCLING [(mode)] (code)
- Confirmation of Mode A: (f) Re-enter Mode S (or ADS-B) aircraft identification
- Code selection: (g) Confirm squawk (code)
- Operation of the ident feature: (h) SQUAWKING (code)
- Temporary suspension of transponder operation: (i) Squawk ident
- Transmit ADS-B ident: (j) Transmit ADS-B ident
- Squawk standby [transmit ADS-B only]: (k)
- Emergency code selection termination of SSR transponder or ADS-B transmitter operation: (l) Squawk mayday
- Transmission of pressure altitude: (m) Stop squawk [transmit ADS-B only]
- Stop ADS-B transmission [squawk (code) only]: (n)
- Pressure setting check and confirmation of level: (o) Squawk charlie
- Termination of pressure altitude transmission because of faulty operation: (p) Transmit ADS-B altitude
- Check altimeter setting and confirm level: (q)
- Stop squawk charlie, wrong indication: (r)
- Altitude check confirmation of ADS-B operation: (s) Stop ADS-B altitude transmission [(wrong indication, or reason)]

[Pilot transmission]  [Military specific]
### Circumstance

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change to secondary transponder</td>
<td>(t) Verify [level] (level)</td>
</tr>
<tr>
<td></td>
<td>(u) ADS-B transmissions not received, confirm ADS-B operational</td>
</tr>
<tr>
<td></td>
<td>(v) Select secondary transponder</td>
</tr>
</tbody>
</table>

2. **Advice or traffic level**

Where the pressure altitude derived level information has not been verified

| Advice or traffic level                | Unverified level (level)                                                  |

---

## Callsigns

**Ground station callsigns** AIP GEN 3.4

**ATS callsigns**

ATS units are identified by the name of the location followed by the service available, as follows:

<table>
<thead>
<tr>
<th>Centre</th>
<th>En route area control, including SIS and FIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approach</td>
<td>Approach control where provided as a separate function</td>
</tr>
<tr>
<td>Departures</td>
<td>Departure control where provided as a separate function</td>
</tr>
<tr>
<td>Final/director</td>
<td>Radar control providing vectors onto final approach</td>
</tr>
<tr>
<td>Tower</td>
<td>Aerodrome control or aerodrome and approach control where these services are provided from an aerodrome control tower, for example Coffs Harbour</td>
</tr>
<tr>
<td>Ground</td>
<td>Surface movement control</td>
</tr>
<tr>
<td>Delivery</td>
<td>Clearance delivery to departing aircraft</td>
</tr>
<tr>
<td>Flightwatch</td>
<td>Flight Information Service</td>
</tr>
</tbody>
</table>

The name of the location or the service may be omitted providing that satisfactory communication has been established.
Aircraft callsigns AIP GEN 3.4

Improper use of callsigns can result in pilots executing a clearance intended for another aircraft. Callsigns should never be abbreviated on initial contact, or at any time when other aircraft callsigns have similar numbers/sounds or identical letters/numbers. For example:

‘charlie whisky zulu’—‘whisky charlie zulu’.

Pilots must be certain that aircraft identification is complete and clearly identified before taking action on an ATC clearance. ATS will not abbreviate callsigns of air carrier or other civil aircraft having authorised callsigns. ATS may initiate abbreviated callsigns of other aircraft by using the prefix and the last three digits/letters of the aircraft identification after communications are established. The pilot may use the abbreviated callsign in subsequent contact with ATS. When aware of similar/identical callsigns, ATS will take action to minimise errors by:

• emphasising certain numbers/letters
• repeating the entire callsign
• repeating the prefix
• asking pilots to use a different callsign temporarily.

Pilots should use the phrase ‘verify clearance for (complete callsign)’ if doubt exists concerning proper identity.

Civil aircraft pilots may state the aircraft type, model or manufacturer’s name, followed by the digits/letters of the registration number, when using CTAF procedures, for example:

‘Bonanza charlie alpha echo’

‘Cherokee alpha bravo charlie’.

The prefix ‘helicopter’ before the callsign must be used by rotary-wing aircraft when first establishing contact on any frequency. For example:

VH-BFK—‘helicopter bravo foxtrot kilo’.

Ground vehicles AIP GEN 3.4

Ground vehicles shall be identified by the type of vehicle, for example car, truck, tractor or tug, or an ATS-approved format, followed by the assigned vehicle number spoken in group form, for example:

Truck 12—‘truck twelve’

Car 23—‘car twenty three’
Conversions

Pressure, temperature and speed

ERSA GEN

Pressure

<table>
<thead>
<tr>
<th>Inches of Mercury</th>
<th>Hectopascals</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.50</td>
<td>1030</td>
</tr>
<tr>
<td>30.00</td>
<td>1025</td>
</tr>
<tr>
<td>29.50</td>
<td>1020</td>
</tr>
<tr>
<td>29.00</td>
<td>1015</td>
</tr>
<tr>
<td>28.50</td>
<td>1010</td>
</tr>
<tr>
<td>28.00</td>
<td>1005</td>
</tr>
<tr>
<td>27.50</td>
<td>1000</td>
</tr>
<tr>
<td>27.00</td>
<td>995</td>
</tr>
<tr>
<td>26.50</td>
<td>990</td>
</tr>
<tr>
<td>26.00</td>
<td>985</td>
</tr>
<tr>
<td>25.50</td>
<td>980</td>
</tr>
<tr>
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<td>975</td>
</tr>
<tr>
<td>24.50</td>
<td>970</td>
</tr>
<tr>
<td>24.00</td>
<td>965</td>
</tr>
</tbody>
</table>

Temperature

<table>
<thead>
<tr>
<th>Degrees Fahrenheit</th>
<th>Degrees Celsius</th>
</tr>
</thead>
<tbody>
<tr>
<td>210</td>
<td>100</td>
</tr>
<tr>
<td>200</td>
<td>90</td>
</tr>
<tr>
<td>190</td>
<td>80</td>
</tr>
<tr>
<td>180</td>
<td>70</td>
</tr>
<tr>
<td>170</td>
<td>60</td>
</tr>
<tr>
<td>160</td>
<td>50</td>
</tr>
<tr>
<td>150</td>
<td>40</td>
</tr>
<tr>
<td>140</td>
<td>30</td>
</tr>
<tr>
<td>130</td>
<td>20</td>
</tr>
<tr>
<td>120</td>
<td>10</td>
</tr>
<tr>
<td>115.2</td>
<td>0</td>
</tr>
</tbody>
</table>

Speed

<table>
<thead>
<tr>
<th>Statute Miles</th>
<th>Nautical Miles, Knots</th>
<th>Kilometres</th>
</tr>
</thead>
<tbody>
<tr>
<td>115.2</td>
<td>100</td>
<td>185.2</td>
</tr>
<tr>
<td>115</td>
<td>100</td>
<td>185</td>
</tr>
<tr>
<td>116</td>
<td>100</td>
<td>180</td>
</tr>
<tr>
<td>117</td>
<td>95</td>
<td>175</td>
</tr>
<tr>
<td>118</td>
<td>90</td>
<td>170</td>
</tr>
<tr>
<td>119</td>
<td>85</td>
<td>165</td>
</tr>
<tr>
<td>120</td>
<td>80</td>
<td>160</td>
</tr>
<tr>
<td>121</td>
<td>75</td>
<td>155</td>
</tr>
<tr>
<td>122</td>
<td>70</td>
<td>150</td>
</tr>
<tr>
<td>123</td>
<td>65</td>
<td>145</td>
</tr>
<tr>
<td>124</td>
<td>60</td>
<td>140</td>
</tr>
<tr>
<td>125</td>
<td>55</td>
<td>135</td>
</tr>
<tr>
<td>126</td>
<td>50</td>
<td>130</td>
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<td>127</td>
<td>45</td>
<td>125</td>
</tr>
<tr>
<td>128</td>
<td>40</td>
<td>120</td>
</tr>
<tr>
<td>129</td>
<td>35</td>
<td>115</td>
</tr>
<tr>
<td>130</td>
<td>30</td>
<td>110</td>
</tr>
<tr>
<td>131</td>
<td>25</td>
<td>105</td>
</tr>
<tr>
<td>132</td>
<td>20</td>
<td>100</td>
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<td>133</td>
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<td>95</td>
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<td>134</td>
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<td>90</td>
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<tr>
<td>135</td>
<td>5</td>
<td>85</td>
</tr>
<tr>
<td>136</td>
<td>0</td>
<td>80</td>
</tr>
</tbody>
</table>

Freezing point: 0°C (32°F)
Distance, volume and mass

### Distance

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Multiply by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metres</td>
<td>Feet</td>
<td>3.281</td>
</tr>
<tr>
<td>Feet</td>
<td>Metres</td>
<td>0.3048</td>
</tr>
</tbody>
</table>

### Volume

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Multiply by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imperial gallons</td>
<td>Litres</td>
<td>4.546</td>
</tr>
<tr>
<td>Litres</td>
<td>Imperial gallons</td>
<td>0.22</td>
</tr>
</tbody>
</table>

### Mass

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Multiply by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kilograms</td>
<td>Pounds</td>
<td>2.2046</td>
</tr>
<tr>
<td>Pounds</td>
<td>Kilograms</td>
<td>0.4536</td>
</tr>
</tbody>
</table>

**Conversion flow diagram—AVGAS specific**

```
Litres -> US Gallons (4.5) -> Imp Gallons (3.27) -> Kilograms (2.2)
     |     |     |     |
     v     v     v     v
Litres -> 1.58 -> Pounds (1.2) -> Kilograms (2.72)
     |     |     |     |
     v     v     v     v
Litres -> 0.72 -> US Gallons (1.2) -> Imp Gallons (3.8) -> US Gallons (6.0)
     |     |     |     |     |     |     |     |
     v     v     v     v     v     v     v     v

multiply
divide
```
Rules for prevention of collision

Overtaking

Overtaking CAR 160
An ‘overtaking aircraft’ means an aircraft that approaches another aircraft from the rear on a line forming an angle of less than 70° with the plane of symmetry of the latter; that is to say, an aircraft that is in such a position with reference to another aircraft that at night it would be unable to see either of the forward navigation lights of the other aircraft.

Right of way

Right of way CAR 161
An aircraft that is required to keep out of the way of another aircraft must avoid passing over or under the other, or crossing ahead of it, unless passing well clear.
An aircraft that has the right of way must maintain its heading and speed, but nothing in the rules shall relieve the pilot in command of an aircraft from the responsibility of taking such action as will best avert collision.
When two aircraft are on converging headings at approximately the same height, the aircraft that has the other on its right must give way, except that (CAR 162):

- power-driven heavier-than-air aircraft shall give way to airships, gliders and balloons
- airships shall give way to gliders and balloons
- gliders shall give way to balloons
- power-driven aircraft shall give way to aircraft that are seen to be towing other aircraft or objects.

When two aircraft are approaching head-on (or approximately so) and there is danger of collision, each shall alter its heading to the right.

An aircraft that is being overtaken has the right-of-way and the overtaking aircraft, whether climbing, descending, or in horizontal flight, shall keep out of the way of the other aircraft by altering its heading to the right, and no subsequent change in the relative positions of the two aircraft shall absolve the overtaking aircraft from this obligation until it is entirely past and clear.
An overtaking aircraft shall not pass the aircraft that it is overtaking by diving or climbing.

An aircraft in flight, or operating on the ground or water, shall give way to other aircraft landing or on final approach to land.

When two or more heavier-than-air aircraft are approaching an aerodrome for the purpose of landing, aircraft at the greater height shall give way to aircraft at the lesser height, but the latter shall not take advantage of this rule to cut in front of another that is on final approach to land, or overtake that aircraft.

Notwithstanding anything contained in the paragraph above, power-driven heavier-than-air aircraft shall give way to gliders.

An aircraft that is about to take off shall not attempt to do so until there is no apparent risk of collision with other aircraft.

An aircraft that is aware that another aircraft is compelled to land shall give way to that aircraft.

See and avoid

**See and avoid** CAR 163A

When weather conditions permit, the flight crew of an aircraft must, regardless of whether an operation is conducted under IFR or VFR, maintain vigilance so as to see, and avoid, other aircraft.
Aircraft equipment

Day VFR equipment

**Day VFR equipment** CAR 174A, CAO 20.18 Appendix 1

The flight and navigational instruments required for flights under visual flight rules are:

- an airspeed indicating system, and
- an altimeter, with a readily adjustable pressure datum setting scale graduated in millibars, and
- one of the following
  - a direct reading magnetic compass or
  - a remote indicating compass and a standby direct reading magnetic compass, and
- an accurate timepiece (clock or watch) indicating the time in hours, minutes and seconds, and
- a turn and slip indicator (only a slip indicator required for agricultural aircraft), and
- an outside air temperature (OAT) indicator where ambient air temperature is not available from ground instruments.

Night VFR equipment

**Night VFR equipment** CAO 20.18 Appendix 4, see also GEN 1.5

In addition to day VFR equipment requirements, flights at night in VMC must have:

- an OAT indicator
- an attitude indicator
- a heading indicator
- a turn and slip indicator except that only a slip indicator is required when a second attitude indicator usable through flight attitudes of 360 degrees of pitch and roll is installed and
- a means of indicating whether power supply to the gyroscopic instruments is working satisfactorily.
Furthermore, as set out below, aircraft flown under VFR at night require (CAO 20.18 Appendix 5 and GEN 1.5):

- a landing light
- illumination for all instruments and equipment used by the flight crew that are essential for the safe operation of the aircraft
- lights in all passenger compartments
- an electric torch for each crew member and
- such other equipment as CASA directs in the interests of safety.

In respect of an aircraft that is not equipped as above, CASA may give permission, subject to such conditions (if any) as are specified in the permission, for the aircraft to be flown under VFR by day or by night.

**Serviceability** CAO 20.18

All instruments and equipment fitted to an aircraft must be serviceable before take-off unless:

- flight with unserviceable instruments or equipment has been approved by CASA, subject to such conditions as CASA specifies or
- the unserviceability is permitted under the provisions of a permissible unserviceability schedule.

Where a flight is conducted with unserviceable instruments or equipment under the provisions of CAO 20.18, the unserviceable instruments or equipment shall be prominently placarded ‘Unserviceable’ or removed from the aircraft.

**Note**—Where an instrument or piece of equipment performs more than one function, it is permissible to placard as unserviceable only the function(s) which are unserviceable.

A charter, aerial work or private operator may elect to have a permissible unserviceability schedule. Charter or aerial work operators must incorporate the permissible unserviceability schedule in the operator’s operations manual.
Rules of the air

VFR navigation

Navigation of aircraft on VFR flight  CAR 174D

The following apply to VFR flight AIP ENR 1.1:

• The pilot in command must navigate the aircraft by visual reference to the ground or water, or by using any of the methods specified in AIP ENR 1.1, except that when operating at or below 2000 ft above the ground or water, the pilot in command must be able to navigate by visual reference to the ground or water.

• When navigating by visual reference to the ground or water, the pilot in command must positively fix the aircraft’s position by visual reference to features shown on topographical charts at intervals not exceeding 30 minutes. When flying over the sea, visual reference features may include rocks and reefs and fixed man-made objects which are marked on suitable charts and are readily identifiable from the air.

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

• When navigating by visual reference in controlled airspace the pilot must notify ATC if the aircraft’s track diverges by more than one (1) nautical mile from the track approved by ATC, or, if navigating by reference to radio navigation aids, by more than the tolerances given in AIP ENR 1.1; and

• VFR flight on top of more than SCT cloud is available provided that:
  – VMC can be maintained during the entire flight, including climb, cruise and descent;
  – For VFR flight on top of more than SCT cloud the pilot must meet, the visual position fixing-requirements or the other navigational requirements of AIP ENR 1.1; and
  – Before flying VFR on top of more than SCT cloud, the pilot in command must ensure that current forecasts and observations (including available in-flight observations) indicate that conditions in the area of, and during the period of, the planned descent below the cloud layer will permit the descent to be conducted in VMC.

The position at which descent below cloud is planned to occur must be such as to enable continuation of the flight to the destination and, if required, an alternate aerodrome in VMC (see notes).
• When navigating by reference to radio navigation systems, the pilot in command must obtain positive radio fixes at the intervals and by the methods prescribed in AIP ENR 1.1.

• The pilot in command of a VFR flight wishing to navigate by means of radio navigation systems or any other means must indicate in the flight notification only those radio navigation aids with which the aircraft is equipped and the pilot is qualified to use under CASR 61.385 (see note 2 below).

• VFR flights must not be conducted above FL200 unless:
  – the pilot in command or, if more than one pilot is required, each pilot:
    ○ is authorised under Part 61 to conduct a flight under the IFR in that airspace and
    ○ complies with the recent experience requirements of Section 6.2.1 or 6.2.3 of CAOs as applicable to the particular flight and
  – the aircraft is equipped for flight under the IFR and
  – the aircraft is engaged in an ‘IFR pick up’, ‘VFR climb/descent’ or ‘VFR on top’ procedure as published in AIP and
  – the aircraft remains in Class E airspace (see AIP ENR 1.1).

Notes

1 A pilot must not undertake a VFR flight on top of more than SCT cloud unless the aircraft is equipped with serviceable flight and navigation instruments as specified in CAO 20.18 Appendix IV (IFR and Night VFR).

2 Pilots are warned against initiating VFR flight on-top when weather conditions are marginal. Before committing their flight to operating VFR flight on-top they should be confident that meteorological information used is reliable and current, and clearly indicates that the entire flight will be able to be conducted in VMC.

Time AIP ENR 1.1

During flight pilots must maintain a time reference accurate to within +/- 30 seconds.

Track keeping AIP ENR 1.1

Tolerances are applied to tracks to assess containment areas for the purposes of ensuring navigational integrity, separation from other aircraft, terrain and obstacle clearance, and avoidance of specified airspace. Although allowing for the errors inherent in the navigation systems used, these tolerances are based on the assumption that the pilot will maintain track as closely as possible.

The pilot in command must, at all times, take positive action to regain track as soon as a deviation from the correct track is recognised.
Avoiding controlled airspace AIP ENR 1.1

Unless an appropriate clearance has been obtained, the pilot in command of an aircraft operating in Class G airspace, or a VFR aircraft operating in Class E airspace, must not allow the aircraft to enter:

a. airspace for which ATC clearance is required; or
b. an active restricted area.

Note 1: Aircraft within controlled airspace or a restricted area may be operating up to the boundary of the airspace.

Note 2: For aircraft operating in close proximity to the boundary of controlled airspace, separation is not provided between aircraft within controlled airspace and aircraft operating outside controlled airspace. Where there is a risk of an airspace infringement, the pilot in command should consider obtaining a clearance to enter the airspace or altering track to remain well clear.

Prohibited, restricted and danger areas

AIP ENR 1.4

The Office of Airspace Regulation (OAR) at CASA designates volumes of airspace as a prohibited, restricted or danger area as follows:

- **A prohibited area (PA)** is designated for reasons of military necessity to prohibit the flight of aircraft over the area. There are currently no designated prohibited areas.

- **A restricted area (RA)** is designated in the interests of public safety, security or for the protection of the environment to restrict the flight of aircraft over the area to aircraft flown in accordance with specified conditions. All permanent restricted areas are given a conditional status which indicates the likelihood of obtaining a clearance through the area. Refer to ERSA and NOTAMs for details. Examples include weapons firing, military flying, communication facilities emitting high-intensity radiated fields, explosive ordnance demolition, aerobatic displays, and police activities. Access to restricted areas must be approved by the controlling authority—refer ENR 1.4 and ERSA PRD

- **A danger area (DA)** is designated where an activity within or over the area is a potential danger to aircraft flying over the area. While no approval is required to fly through a DA, pilots are encouraged to be particularly vigilant if electing to do so. Examples include: flying training, gliding competitions, parachuting activities, mine blasting, high velocity plume rise and small arms firing.
Formation flying

**Operating near other aircraft** CAR 163
An aircraft must not be flown so close to another aircraft as to create a collision hazard. An aircraft must not be operated on the ground in such a manner as to create hazard to itself or to another aircraft.

**Formation flying** CAR 163AA
Aircraft must not be flown in formation unless:
- each of the pilots in command is authorised to fly in formation
- the formation is pre-arranged between the pilots in command and
- the formation flight is conducted either:
  - under VFR by day or
  - under an approval given by CASA.
- two or more aircraft are flown in formation if they are flown in close proximity to each other and they operate as a single aircraft with regard to navigation, position reporting and control.

Aircraft speeds

Unless for safety reasons, civil aircraft must not be operated at indicated airspeeds greater than the following:

<table>
<thead>
<tr>
<th>Airspace classification</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class C</td>
<td>250 kt IAS below 10,000 ft AMSL</td>
</tr>
<tr>
<td>Class D</td>
<td>200 kt IAS – at or below 2500 ft AAL within 4 NM of the primary Class D aerodrome</td>
</tr>
<tr>
<td></td>
<td>250 kt IAS – in the remaining Class D airspace</td>
</tr>
<tr>
<td>Class E</td>
<td>250 kt IAS below 10,000 ft AMSL</td>
</tr>
<tr>
<td>Class G</td>
<td>250 kt IAS below 10,000 ft AMSL</td>
</tr>
</tbody>
</table>

Source: AIP ENR 1.1

**Note 1**—Pilots must comply with airspace speed limitation unless specifically cancelled by ATC.
**Note 2**—Speed limitations are not applicable to military aircraft except as specified in ERSA.
Regulation of flight

Regulation of flight—assessment of priorities
ATC will regulate operations to minimise the possibility of conflict and, provided that safety is in no way jeopardised, will apply priorities as outlined in AIP ENR 1.4.

Aerodromes

Non-controlled aerodromes

Responsibility for compliance with rules of this division CAR 164
When operating an aircraft on or in the vicinity of an aerodrome the pilot in command shall be responsible for compliance by the aircraft with the following rules:

Operation on and in the vicinity of non-controlled aerodromes
CAR 166, CAR 166A, CAR 166B, CAR 166C
Note—Non-controlled aerodromes include those aerodromes with Class C or D ATS services when those services are not available. Consult ERSA and NOTAMs for operating times.

An aircraft is ‘in the vicinity of’ a non-controlled aerodrome if it is within:
- airspace other than controlled airspace; and
- 10 nm from the aerodrome; and
- a height above the aerodrome that could result in conflict with operations at the aerodrome.

If an aerodrome reference point (ARP) is published for the aerodrome in AIP, the distance or height must be measured from that point.

The pilot in command of an aircraft that is being operated on, or in the vicinity of, an aerodrome:
- must maintain a lookout for other aircraft to avoid a collision
- must ensure the aircraft does not cause a danger to other aircraft and
- must not take off or land on a part of the aerodrome outside the landing area.
If pilots are flying in the vicinity of the aerodrome they must:

- join the circuit pattern for the aerodrome or
- avoid the circuit pattern.

When approaching or taking off from an aerodrome the pilot must make all turns to the left unless:

- CASA has directed otherwise for that particular aerodrome or
- visual signals indicating the direction of turn are displayed in the signal circle.

After take-off the pilot must maintain the same track from take-off until the aircraft is 500 ft above the terrain unless a turn is required to avoid terrain.

The pilot in command must take off or land into wind unless:

- the aircraft’s flight manual allows the aircraft to take off or land downwind and
- after considering other aircraft operating on, or in the vicinity of, the aerodrome the pilot believes it is safe to do so.

The pilot in command may carry out a straight-in approach to land provided, the pilot:

- determines the wind direction and the runways in use
- gives way to any other aircraft flying in the circuit pattern for the aerodrome and
- manoeuvres to establish the aircraft on final approach at least 3 nm from the threshold intended for landing.

The pilot in command is responsible for making a broadcast on the aerodrome frequency when the aircraft is operating on, or in the vicinity of, a non-controlled aerodrome.

The pilot must broadcast information whenever it is reasonably necessary to do so to avoid risk of collision and must include:

- the name of the aerodrome
- the aircraft’s type and callsign and
- the position of the aircraft and the pilot’s intentions.
**Procedure at controlled aerodromes** CAR 167

The pilot in command of an aircraft that is part of the traffic at a controlled aerodrome must:

- maintain a lookout for other aerodrome traffic to avoid a collision
- maintain a continuous listening watch on the radio frequency for the aerodrome control service and
- maintain a listening watch for, or obtain clearance by, radio or visual signals, prior to carrying out any taxiing, landing or take-off manoeuvre.

**Aerodromes at which the operation of aircraft is not restricted to runways**

The rules to be followed by aircraft operation at such aerodromes can be found in CAR 168.

**Use of aerodromes** CAR 92

An aircraft shall not land at, or take off from, any place unless:

- the place is an aerodrome established under the Air Navigation Regulations
- the use of the place as an aerodrome is authorised by a certificate, or registration under CASR Part 139
- the place is an aerodrome for which an arrangement under section 20 of the Act is in force and the use of the aerodrome by aircraft engaged in civil air navigation is authorised by CASA under that section or
- the place (other than in the above three points) is suitable for use as an aerodrome for the purposes of the landing and taking off of aircraft; and, having regard to all the circumstances of the proposed landing or take-off (including the prevailing weather conditions), the aircraft can land at, or take off from, the place in safety.

Guidance as to the suitability of such aerodromes as may be found in CAAP 92 ‘Guidelines for aeroplane landing areas’.
**Emergency landings**

When safety is involved, the nearest aerodrome which will permit a landing without danger to the aircraft may be used, irrespective of the damage that may be caused to the pavement.

**Mercy flights** AIP ENR 1.1

Decisions should be made in accordance with the degree of urgency involved. Severe overloading of pavements is acceptable if the safety of patients, crew and aircraft is not thereby jeopardised.

**Circuit height** AIP ENR 1.1

By convention, the following circuit heights are flown:

- High performance, above 150 kt, 1500 ft AGL
- Medium performance, between 55 kt and 150 kt, 1000 ft AGL and
- Low performance, maximum 55 kt, 500 ft AGL

Circuit heights for aerodromes which have specific requirements are published in *ERSA*. 
Aerodrome markings

Light and ground signals

AIP ENR 1.5

Light signals

<table>
<thead>
<tr>
<th>On ground</th>
<th>Light mode</th>
<th>In flight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorised to <strong>take off</strong> if pilot is satisfied that no collision risk exists</td>
<td>Green</td>
<td>Authorised to <strong>land</strong> if pilot is satisfied that no collision risk exists</td>
</tr>
<tr>
<td>Authorised to <strong>taxi</strong> if pilot is satisfied that no collision risk exists</td>
<td>Green flashing</td>
<td><strong>Return</strong> for landing</td>
</tr>
<tr>
<td><strong>Stop</strong></td>
<td>Red</td>
<td><strong>Give way</strong> to other aircraft <strong>Continue</strong> circling</td>
</tr>
</tbody>
</table>
| **Taxi clear of landing area**  
  In use | Red flashing | **Do not land**  
  Aerodrome unsafe |
| **Return** to starting point  
  on aerodrome | White flashing |  |

Symbols near wind direction indicator

- Aerodrome unserviceable
- Gliding operations in progress  
  Operations are confined to hard surface runways, aprons and taxiways only
- Unserviceable area marker
- Boundary markers
Displaced threshold

AIP AD

Markings for a temporarily displaced threshold due to **obstacle infringement of approach surface** for a period of **30 days or less**

Markings for a temporarily displaced threshold due to **works on the runway** for a period of **30 days or less**
Markings for a temporarily displaced threshold due to **obstacle infringement of the approach path** for a period in **excess of 30 days**

Piano key, runway designation number and portion of runway edge marking obliterated  
Temporarily displaced threshold markers (white)  
Arrows leading to displaced threshold (white)  
Clear approach surface  
Commencement of TODA

Commencement of LDA  
Temporarily relocated runway designation marking (white)

Markings for a temporarily displaced threshold due to **works on the runway** for a period in **excess of 30 days**

Piano key, runway designation number and portion of runway edge marking obliterated  
Works limit markers (orange)  
Unserviceability markers  
Arrows leading to displaced threshold (white)  
Unserviceability markers (red and white)  
Works area

Commencement of TODA  
Temporarily displaced threshold markers (white)  
Temporarily relocated runway designation marking (white)
Radar transponders

Primary and secondary radar

**Primary radar** is a system where the ground-based antenna transmits a radar pulse, then listens for the small amount of return energy that is reflected from an aircraft. The time delay between the transmission of the pulse and the receipt of the reflected return is a measure of the range.

**Secondary radar** requires an airborne transponder which responds to the receipt of a pulse from a ground-based antenna by transmitting a return signal. Because the transponder transmits a much stronger signal than that which is reflected off an aircraft in primary radar systems, greater range and reliability can be achieved with secondary radar and cheaper and more efficient ground equipment can be used. Additionally, information such as altitude and a code can be added to the returned signal from the transponder which is then displayed on the operator’s screen.

**Traffic alert and collision avoidance system (TCAS)** is an airborne system which is capable of interpreting the transponder returns of nearby aircraft and displaying the positions of these aircraft on a cockpit display. TCAS can warn the crew of impending collisions and advise avoidance manoeuvres provided it receives the altitude information from nearby aircraft. For this reason, mode C (the ALT selection on a typical transponder) should always be selected by all aircraft outside controlled airspace.

TCAS is fitted to most commuter aircraft that operate in Class D, E and G airspace. It is therefore in everybody’s interest for all VFR transponder equipped aircraft in Class E or G to squawk code 1200 with ALT selected.

**ADS-B approval and operations**

Automatic dependent surveillance–broadcast (ADS-B) is a means by which aircraft, aerodrome vehicles and other objects can automatically transmit or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link. An aircraft, which is fitted with serviceable ADS-B transmitting equipment that complies with an approved equipment configuration, must operate the equipment continuously during the flight in all airspace at all altitudes unless the pilot is directed or approved otherwise by ATC.
Transponder operation

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

Standard transponder codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200</td>
<td>Civil VFR flights in Class E or G airspace</td>
</tr>
<tr>
<td>2000</td>
<td>Civil IFR flights in Class G airspace</td>
</tr>
<tr>
<td>3000</td>
<td>Civil flights in A, C and D airspace, or IFR flights in Class E airspace</td>
</tr>
<tr>
<td>6000</td>
<td>Military flights in Class G airspace</td>
</tr>
<tr>
<td>7500</td>
<td>Unlawful interference</td>
</tr>
<tr>
<td>7600</td>
<td>Communications failure</td>
</tr>
<tr>
<td>7700</td>
<td>Emergency</td>
</tr>
</tbody>
</table>

Important points in transponder operation

- Select standby (STBY) before changing codes. Otherwise there is the real possibility of transmitting a non-authorised code during the process.
- Do not press the IDENT feature unless requested by ATS. ‘Squawk’ does not mean press the IDENT. ‘Squawk IDENT’ is the request used for this purpose.
- ‘Squawk STBY’ means switch to the STBY position.
- ‘Squawk 5632’ for example, means select STBY, then select code 5632, then squawk ALT.
- Transponders require a warm up before being selected ON or ALT. The STBY position is used to warm up the transponder.
- In the TEST position the reply light should come on while the selector is held in this position.
- The reply light comes on each time the transponder responds to an interrogation. This may be from ground-based secondary radar, or from a nearby TCAS-equipped aircraft.
- In the ON position no altitude information is being transmitted.
• On occasions transponders may require ‘recycling’ to restore correct encoding. To recycle, briefly select STBY then return to ALT.

• A mode S transponder may have a GND selection on the switch. When you are taxiing on the ground, the transformer should be set to GND unless your installation includes a gear squat switch.

**Note**—Information on the operation of transponders in the ATC radar environment is shown in the VFRG section on—**ATS surveillance services**.
This pre-flight planning section of the VFRG has been designed to bring together the necessary information from various documents in one place to enable the pilot in command to plan a flight safely. Some of the information has been repeated from other sections to improve usability of the document.
Preparation

Pre-flight information

Planning of flight by pilot in command CAR 239, AIP ENR 1.10

Before beginning a flight, the pilot in command must study all available information appropriate to the intended operation. In the case of VFR flights away from the vicinity of an aerodrome, flights over water and all IFR flights, the pilot will make a careful study and plan in relation to the following:

- current weather reports and forecasts for the route to be followed and at aerodromes to be used
- the airways facilities available on the route to be followed (if qualified to use them) and the condition of those facilities
- the condition of aerodromes to be used and their suitability for the aircraft intended to be used
- the air traffic control rules and procedures applicable to the particular flight, and
- all Head Office and flight information region (FIR) NOTAM applicable to the en-route phase of flight, in addition to any location specific NOTAM.

You must calculate adequate fuel to allow for the safe execution of your plan (including any alternate courses of action) to satisfy the requirements within CAR 234.

Notes

1. Full details on the briefing services provided are available in ERSA GEN – PF (FIS Pre-flight).
2. For the purposes of pre-flight planning, you must use only meteorological reports or forecasts made with the authority of the Director of Meteorology or a person approved by CASA for the purpose (CAR 120).

Pre-flight information AIP GEN 3.1

Pre-flight information services are provided from the Network Coordination Centre (NCC) Pilot Briefing Office, located in Canberra. This office provides the following services:

- meteorological
- NOTAM
- flight notification
- COBT
Pilots must obtain an appropriate pre-flight briefing before departure from those places where suitable facilities exist. Where suitable facilities are not available, a briefing may be obtained from FLIGHTWATCH as soon as practicable after the flight commences. Information you request should be limited to data considered essential for the safe conduct of the flight to the first point of intended landing where additional information can be obtained. (AIP GEN 3.3)

The pre-flight briefing service is primarily an automated one. Pilots are encouraged to obtain pre-flight briefing either via the self-help electronic systems or through the briefing offices. These services are listed in ERSA GEN – PF. If required, elaborative briefings are available by contacting ATS and BoM staff from the briefing offices. For more information on this subject, see page 2.80.

Note—Pre-flight briefing will not normally be provided on ATC communication channels.

Weather forecast requirements AIP ENR 1.10

Weather forecast information must include:

• an aerodrome forecast for the:
  – destination and
  – when required, alternate aerodrome and

• one of the following:
  – a flight forecast or
  – a GAF (at and below A100) or
  – a SIGWX forecast (above A100) and

• a wind and temperature forecast

For a flight to a destination for which a prescribed instrument approach procedure does not exist, the minimum requirement is a GAF.

Note—A wind and temperature forecast may be obtained from wind and temperature charts, grid point wind and temperature charts, route sector winds and temperatures forecasts, a NAIPS wind and temperature profile (applicable for the flight), as well as from approved flight planning systems that derive data from the Bureau of Meteorology or the WAFS.

For private, charter and aerial work night VFR operations, the obtained forecast must indicate a cloud base ceiling no less than 1000 ft AGL above the highest obstacle within 10 nm either side of track.
Flights for which a forecast is required and cannot be obtained, are permitted to depart provided the pilot is satisfied that the weather at the departure point will permit the safe return of the flight within one hour of departure. The flight is permitted to continue if a suitable forecast is obtained for the intended destination within 30 minutes after departure (AIP ENR 1.10).

The validity period of the weather forecasts must cover the period of the flight. Furthermore, the aerodrome forecasts for the destination and alternate aerodromes—to be nominated in the flight plan—must be valid for a period of not less than 30 minutes before and 60 minutes after the planned ETA. If departure is delayed and results in the planned ETA falling outside the above-mentioned forecast validity period, meteorological updates must be obtained as necessary to ensure the safety of the flight.

If the pre-flight briefing is obtained more than one hour before taxiing for departure, you should obtain an update before departure to ensure that the latest information available can be used for the flight. Obtain this update by:

- NAIPS pilot access
- telephone or
- when the above is impracticable, by radio.

More than one flight may be included in one flight plan provided that the meteorological forecast validity period covers all flights and relevant AIS information is available at flight planning.
Alternate requirements – weather reports and forecasts AIP ENR 1.1

In addition to the above requirements, CAR 239 also requires you to consider flying to an alternate aerodrome during pre-flight planning and ensuring you carry additional fuel to allow for any alternate courses of action. CASA gives directions regarding alternate planning requirements in the AIP ENR 1.1. In deciding whether or not to plan for an alternate, you must consider each of the following:

- weather reports and forecasts—weather conditions and integrity of weather information
- radio navigation aids (if NVFR)—availability and serviceability and
- runway lighting (if NVFR)—type and reliability of runway lighting and availability of aerodrome personnel.

As pilot in command, you must make provision in your pre-flight planning for an alternate aerodrome if:

- you plan to arrive at your destination
  - 30 minutes before the commencement of
  - during or
  - 30 minutes after the end of the validity period of a forecast that indicates meteorological conditions that are below alternate minima or
- if the forecast for the destination is:
  - not available or
  - is attached with the term ‘provisional’.

The VFR alternate minima are as follows:

- for aeroplanes:
  - a cloud base that is SCT with a ceiling of 1500 ft
  - 8 km visibility
- for helicopters:
  - a cloud base that is SCT with a ceiling of 1000 ft
  - 3000 m visibility.

This alternate provision does not apply to day VFR flights within 50 nm from the point of departure.
Radio communications requirements

CAR PART 8, AIP GEN 1.5

As the pilot of an aircraft, you must ensure that the aircraft is equipped with radio communications systems capable of continuous communication according to the class of flight (IFR or VFR) and the category of airspace in which you will be flying (AIP GEN 1.5). This includes ensuring that the radio communication system is of an approved type.

The radio communication system in the aircraft must be licensed and approved by the Australian Communication and Media Authority (ACMA) in accordance with the Radiocommunications (Aircraft and Aeronautical Mobile Stations) Class Licence 2006 legislation. Furthermore, to use the aircraft’s radio communication system, you must hold a flight radiotelephony operator licence that qualifies you to communicate using the radio station (CAR 166E, CAR 83).

VFR requirements

<table>
<thead>
<tr>
<th>Class</th>
<th>Airspace</th>
<th>Communication requirements</th>
<th>See notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPT</td>
<td>Classes A, C, D, E, G</td>
<td>VHF and HF or 2 VHF</td>
<td>1, 2, 3, 4, 6</td>
</tr>
<tr>
<td>CHTR</td>
<td>Classes A, C, D, E, G</td>
<td>VHF HF</td>
<td>2, when VHF does not allow continuous communication with ATS at all stages of flight: 3, 4, 5, 6, 7</td>
</tr>
<tr>
<td>NGT VFR</td>
<td>Classes A, C, D, E, G</td>
<td>VHF</td>
<td>2</td>
</tr>
<tr>
<td>VFR</td>
<td>Classes A, C, D, E</td>
<td>VHF</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Class G—5000 ft and above</td>
<td>VHF</td>
<td>Except gliders at and below FL200: 2</td>
</tr>
<tr>
<td></td>
<td>Class G—Certified, registered, military aerodromes where the carriage and use of radio is required</td>
<td>VHF</td>
<td>2, 5</td>
</tr>
<tr>
<td></td>
<td>Class G—below 3000 ft AMSL or 1000 ft AGL</td>
<td>VHF</td>
<td>In reduced VMC: 2, 5</td>
</tr>
<tr>
<td>Gliders</td>
<td>Class G</td>
<td>VHF</td>
<td>Operations at aerodromes serviced by RPT: 5</td>
</tr>
</tbody>
</table>
Notes

1. The pilot must have a valid instrument rating and fly in day VMC only with continuous communication capability in accordance with CAO 82.3.7.3(c).

2. VHF communications systems must be capable of communication on all VHF frequencies required to meet the reporting and broadcast requirements of AIP ENR 1.1.

3. HF communications systems must be fitted with frequencies appropriate to the area of operation as specified in the AIP ERSA – NAV/COM. The frequencies fitted must be sufficient to enable continuous communication with ATS units for the planned duration of the flight or while operating within the specified area, taking into account the expected radio propagation conditions during the period of operation.

4. At least one item of the required radio equipment must be capable of maintaining continuous communication with ATS at all stages of the flight. The term ‘all stages of flight’ includes ground operations at the aerodromes of departure and arrival, and cruising levels that could be required for any emergency and/or abnormal operation en route. However, when continuous VHF can be maintained but cannot be guaranteed, a SATCOM telephone may be used instead of HF subject to the conditions in AIP GEN 1.5. See AIP GEN 3.4 for SATCOM procedures.

5. An approved and licensed hand-held VHF radio may be used by pilots (AIP GEN 1.5):
   - of VFR private and airwork aeroplanes with an MTOW not exceeding:
     - in the case of an aeroplane other than a seaplane 600 kg; and
     - in the case of a seaplane with two seats 650 kg;
   - of gliders
   - of balloons.

   Additionally, approved hand-held radios may be used by pilots of these aircraft when operating in Class G. Where the radio is not connected to the aircraft’s primary power supply, there must be ready access to back-up power.

6. Planning Chart Australia (AUS PCA) shows the areas in which an aircraft, flying at the altitudes indicated, could be expected to maintain continuous VHF communications with an ATS unit.

7. Private aircraft without radio may be admitted to the CTRs for maintenance subject to the approval of the appropriate ATC unit. Pilots must comply with any conditions contained in the approval (see AIP GEN 1.5).

Alternate due to weather

General alternate requirements CAR 239, CAR 234, CAAP 234

CAR 234 (3) (c) (i) requires you, as pilot in command, to make provision to carry adequate fuel so that, in the event of a forced diversion (due to prevailing weather conditions), you may navigate and land at an alternative aerodrome in safety. The preceeding parts to this section of the VFRG address the other factors mentioned in CAR 234.
During your pre-flight planning for a proposed flight, CAR 239 requires you to study all available information appropriate to the flight. If you plan to fly beyond the vicinity of the aerodrome, pre-flight study must include the current weather reports and forecasts for the route to be followed and at aerodromes to be used (CAR 239 (1) (a)).

CASA publishes definitions of meteorological minima for various flying operations and provides direction and guidance that will ensure adequate fuel is carried that is commensurate to the studied meteorological conditions. For instance, CASA provides guidance regarding (CAR 240 (1)):

- the circumstances in which a pilot in command must plan for an alternative course of action
- the grounds on which an alternate aerodrome is in itself suitable to land and
- the calculation of fuel that must be carried to ensure safety given the above factors.

This subsection of the VFRG outlines CASA’s guidance material regarding alternate requirements due to weather, which is published in AIP ENR 1.1 and CAAP 234-1(1).

**Alternate aerodrome suitability AIP ENR 1.1**

When nomination of an alternate aerodrome is required, any aerodrome may be nominated for that flight providing:

- it is suitable as a destination for that flight, and
- is not an aerodrome for which that flight would require to provide for an alternate aerodrome.

For flights to a destination for which an aerodrome forecast is required and cannot be obtained or is “provisional”, the flight is permitted to depart provided an alternate aerodrome meeting all the requirements, is nominated.

**Alternate minima AIP ENR 1.1**

For flight by aeroplanes under VFR (day or night) and helicopters operating under VFR at night, the alternate minima are a ceiling of 1500 ft and a visibility of 8 km (AIP ENR 1.1). For VFR helicopter operations by day, the alternate minima are the same as for night unless the additional conditions specified below are met (AIP ENR 1.1).

When operating a helicopter under VFR, and the use of helicopter VMC is permissible at the destination, the pilot in command must provide for a suitable alternate aerodrome when either of the following conditions is forecast at the destination:

- cloud—more than SCT below a ceiling of 1000 ft or
- visibility—less than 3000 m.
A flight permitted to operate under VFR at night (AIP ENR 1.2) must provide for an alternate aerodrome within a one hour flight time from the destination unless:

- the destination is served by a radio navigation aid (NDB/VOR) and the aircraft is fitted with the appropriate radio navigation system capable of using the aid or
- the aircraft is fitted with an approved GNSS receiver and the pilot and aircraft meet the requirements of AIP GEN 1.5.

**Weather conditions** AIP ENR 1.1

Except when operating an aircraft under VFR by day within 50 nm of the point of departure, the pilot in command must provide for a suitable alternate aerodrome when arrival at the destination will be during the currency of, or up to 30 minutes prior to the forecast commencement of, the following weather conditions:

- cloud—more than SCT below the alternate minimum
- visibility—less than the alternate minimum
- visibility—greater than the alternate minimum, but the forecast is endorsed with a percentage probability of fog, mist, dust or any other phenomenon restricting visibility below the alternate minima or
- wind—a crosswind or downwind component more than the maximum for the aircraft. Wind gusts must be considered.

**Note**—In determining requirements for alternate aerodromes, forecast amounts of cloud below—the alternate minima are cumulative. For determining requirements, the cumulative cloud amount is interpreted as follows (AIP ENR 1.1):

- FEW plus FEW is equivalent to SCT
- FEW plus SCT is equivalent to BKN and
- SCT plus SCT is equivalent to BKN or OVC.

When weather conditions at the destination are forecast to be as specified above, but are expected to improve at a specific time, provision for an alternate aerodrome need not be made if sufficient fuel is carried to allow the aircraft to hold until that specified time plus 30 minutes.

When weather conditions at the destination are forecast to be above the values specified above, but additionally, intermittent or temporary deteriorations in the weather below those values are forecast, provision of an alternate need not be made if sufficient additional fuel is carried to allow the aircraft to hold for:

- 30 minutes for intermittent deterioration (INTER) and
- 60 minutes for temporary deterioration (TEMPO).
When thunderstorms, or their associated severe turbulence, or their probability are forecast at the destination, sufficient additional fuel must be carried to permit the aircraft to proceed to a suitable alternate or to hold for:

- 30 minutes when the forecast is endorsed INTER or
- 60 minutes when the forecast is endorsed TEMPO.

INTER and TEMPO holding fuel requirements are not cumulative. When a forecast has a number of INTER or TEMPO deteriorations, holding fuel is required only for the most limiting requirement (AIP ENR 1.1).

When TAFs include an FM or a BECMG causing an operational requirement to either become effective or be removed, the timing for the change in operational requirement is as follows (AIP ENR 1.1):

- when the weather during the FM or BECMG is forecast to create an operational requirement, that operational requirement will become effective 30 minutes before the onset of the FM time, or 30 minutes before the start of the BECMG period; and
- when the weather during the FM or BECMG is forecast to remove an operational requirement, that operational requirement will remain effective until 30 minutes after the FM time, or 30 minutes after the end of the BECMG period.

The additional fuel required by the above conditions must be carried when the ETA of the aircraft at its destination or alternate falls within the period of 30 minutes before the forecast commencement time to 30 minutes after the expected time of cessation of these deteriorations. If the holding time required because of INTER or TEMPO or the probability of INTER or TEMPO requirements (as described above) extends past 30 minutes after the forecast cessation of these deteriorations, the aircraft need only carry sufficient fuel to hold until 30 minutes after the forecast cessation time (AIP ENR 1.1).

Due to the continuous weather watch provided by TTF, the 30-minute buffers required by the above conditions do not apply. Flights which will be completed within the time of validity of the TTF may be planned wholly with reference to the destination TTF (AIP ENR 1.1).

TTF may have either one visibility or two visibilities included in the report. Operational requirements will apply when (AIP ENR 1.1):

- the sole visibility is less than the alternate minimum or
- the higher visibility is less than the alternate minimum.

Flights which cannot use TTF will plan the flight on the current TAF until such time as the destination ETA falls within the validity periods of a TTF (AIP ENR 1.1).
Alternate due to facilities

AIP ENR 1.1

For night VFR operations, alternate requirements relate to airport lighting and navaids. Where these facilities are subject to operational changes (for example, due to maintenance, malfunction, upgrade or decommissioning) and these changes have been reported to the Airservices Australia NOTAM office, you will find details about the change in the NOTAMs. During your pre-flight planning where the use of air navigation facilities is required for your flight, it is essential that you check NOTAMs so you meet operational requirements. The details of these requirements are given in the night VFR section on page 3.132.

Take-off and landing requirements

**Weight and balance** CAR 235, CAO 20.7.4

CASA may give directions as to how to estimate or determine the weight and centre of gravity of a particular aircraft and may require changes to the published weight and centre-of-gravity limits.

These limitations are found in the aircraft flight manual or placard information and must be complied with during all stages of flight.

In determining the maximum weight and centre of gravity limits, CASA may take into consideration:

- the type of aircraft
- the kind of operations to be carried out during the flight
- the performance of the aircraft in configurations in which it is likely to be flown, and with faults that are likely to occur
- the meteorological conditions at the aerodromes at which the aircraft is to take off or land
- the altitude of the aerodromes at which that aircraft is to take off or land
- the aerodrome dimensions in the direction in which the aircraft is to take off or land
- the material of which the surface of the aerodrome in the direction in which the aircraft is to take off or land is constituted and the condition and slope of that surface
• the presence of obstacles in the vicinity of the flight path along which the aircraft is to take off, approach or land

• the anticipated meteorological conditions over the intended route to be flown by the aircraft after take-off and over planned divergences from that route and

• the altitude of the terrain along and on either side of the intended route to be flown by the aircraft after take-off and of planned deviations from that route.

An aircraft must not take off, or attempt to take off, if its gross weight exceeds its maximum take-off weight or, if a lesser weight determined in accordance with a direction under CAR 235 is applicable to the take-off, that lesser weight.

An aircraft must not take off, or attempt to take off, if its gross weight exceeds, by more than the weight of fuel that would normally be used in flying to its next landing place or planned alternative aerodrome, its maximum landing weight; or if a lesser weight determined in accordance with a direction under CAR 235 is applicable to landing at that place or aerodrome, that lesser weight.

Except in an emergency, an aircraft must not land if its gross weight exceeds its maximum landing weight or, if a lesser weight determined in accordance with a direction under CAR 235 is applicable to the landing, that lesser weight.

An aircraft must not take off, or attempt to take off, unless any directions with respect to the loading of the aircraft given under the regulations have been complied with.

The pilot in command must ensure that the load of an aircraft throughout a flight shall be so distributed that the centre of gravity of the aircraft falls within the limitations specified in its certificate of airworthiness or its flight manual.

Note—CAAP 235 reiterates the safety precautions that should be used to ensure compliance with CAR 235. It includes directions on how to determine runway clearance factors.

Determining weight limitations with meteorological conditions

CAR 235 requires the consideration of meteorological conditions when determining aircraft weight limitations for take-off and landing. The meteorological information to be used for determining weight limitations is as follows (CAO 20.7.4 para 4 and 5):

• for take-off
  – ambient meteorological conditions; or
  – approved declared conditions; and

• for landing
  – forecast meteorological conditions; or
  – approved declared conditions.
Note—it is acceptable to base all take-off and landing weight limitation calculations on declared meteorological conditions (see below) alone and you may only be required to determine weight limitations three times per year (for summer, winter and autumn/spring seasons). However, if calculations based on declared conditions result in a take-off or landing weight limitation that is too restrictive for a flight to or from a particular aerodrome, recalculating weight limitations based on ambient (for take-off weight) or forecast (for landing weight) conditions may result in acceptable weight limitations for your flight.

Declared density chart CAO 20.70

Declared density chart—Summer (December–February)

Instructions for use
Locate the position of the aerodrome by means of latitude and longitude.

To obtain the Seasonal Declared Density Altitude, add the height above sea level of the aerodrome to the value read from this chart.
Declared density charts are one acceptable means of determining take off and landing weight limitations at an aerodrome. There are three charts: one for summer months, one for winter months and one for both autumn and spring months.

The lines on the charts indicate lines of equal density altitude at the location of the aerodrome. However, these density altitude values do not take into account ground elevation and the values are assumed to be true at mean sea level. Therefore, you must add the aerodrome elevation to the declared density value at the appropriate location on the chart and then use this sum for take off and landing weight limitation calculations.

**Declared density chart – Winter (June–August)**

**Instructions for use**

Locate the position of the aerodrome by means of latitude and longitude.

To obtain the Seasonal Declared Density Altitude, add the height above sea level of the aerodrome to the value read from this chart.
In some cases, the take off and landing weight limitation charts in some aircraft flight manuals require you to use the combination of pressure height (PH) and ambient outside air temperature (OAT) in order to determine weight limitations. In this case, you can assume international standard atmosphere (ISA) temperature for these calculations, thus the PH will be declared density (read off the declared density chart) plus field elevation, and then use ISA OAT for the field elevation.

**Declared density chart—Autumn (March–May)—Spring (September–November)**

**Instructions for use**

Locate the position of the aerodrome by means of latitude and longitude.

To obtain the Seasonal Declared Density Altitude, add the height above sea level of the aerodrome to the value read from this chart.
Icing

**Icing conditions pre-flight information**

When planning flights at or below 10,000 ft, note that the graphical area forecast (GAF) includes information about known or expected icing conditions, and which is available through NAIPS. General information about icing conditions is stated under the ‘Cloud, icing and turbulence’ heading of the GAF.

Information about reported icing conditions that may affect the safety of aircraft operations (that is severe icing), will be included in the SIGMET.

Information about icing conditions that may affect aircraft operations but to a lesser degree of severity than those issued as a SIGMET (that is moderate icing), will be included in the AIRMET.

Information about icing conditions within 5 nm radius of an aerodrome serviced by an AWS or an authorised meteorological observer, may be included in SPECI if it is likely to affect aircraft operations safety (AIP GEN 3.5).

**Icing conditions airframe** CAR 238

As pilot in command of an aircraft, you must not take off for the purpose of making a flight during which the aircraft may fly into known or expected icing conditions unless the aircraft is adequately equipped with either de-icing or anti-icing equipment of the type and quantity as directed by CASA.

**Icing conditions carburettor**

Carburettor icing is of particular concern because, unlike airframe icing, the risk of ice build-up in the carburettor can be high even with no visible moisture and an OAT of up to 38°C.

Carburettor icing occurs when the air temperature adiabatically decreases sufficiently to condense water vapour and for the localised air temperature to reduce below freezing. Ice builds up as the chilled condensed water makes contact with localised surfaces, such as the butterfly valve and the venturi walls. Carburettors experience additional cooling because of the evaporation of fuel. Furthermore, the risk of carburettor icing is significantly increased at partial power settings (for example, when power is reduced during descent), because of the cooling effect of a partly-closed throttle.
CASA has published a specialised chart to measure carburettor icing probability based on known OAT and dew-point depression. Dew-point depression is the difference between OAT and dew-point temperature and this information is available from an aerodrome’s AWS or in METAR/SPECI aerodrome meteorological reports.

Example of carburettor icing probability shown on the chart below

OAT (or dry bulb temperature) = 12°C

Dew point = 2°C

1 Calculate **dew point depression**: OAT (or dry bulb temperature) minus dew point = 12 – 2 = 10.

2 Find the intersection of 12 (x axis) and 10 (y axis) and note the shading indicates:
   - **moderate icing for cruise power** or
   - **serious icing for descent power**.

3 From the intersection, follow the slanted reference lines to the right and note **relative humidity** is 52 per cent.

**Carburettor icing probability chart**
To use the chart
1. Obtain the temperature and dew point.
2. Calculate temperature minus dew point. This figure is used as the dew point depression.
3. Find the intersection between the temperature (x-axis) and the dew point depression (y-axis) and note the shaded area of its location.
4. For relative humidity, follow the slanted reference lines to the right and refer to the relative humidity scale for a percentage value.

Fuel requirements

**Fuel requirements** CAR 234, CAAP 234-1(2)

The fuel rules are aimed at ensuring that you always have enough fuel on board for your planned flight plus a safe margin.

The quantity of fixed fuel reserve is prescribed for different categories of flight, and you must plan to land with your fixed fuel reserves intact. If you need to use your fixed fuel reserve, you are considered to be in an emergency state.

A pilot in command must:
1. Determine how much fuel is required for flight
2. Establish how much fuel is on board before flight
3. Conduct regular in-flight fuel checks
4. Declare an emergency if you need to use your fixed fuel reserve

**Fixed Fuel Reserves**

<table>
<thead>
<tr>
<th>Private Operations</th>
<th>Day VFR</th>
<th>Night VFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small aeroplane</td>
<td>30 minutes</td>
<td>45 minutes</td>
</tr>
<tr>
<td>Helicopter</td>
<td>20 minutes</td>
<td>20 minutes</td>
</tr>
</tbody>
</table>

Variable fuel reserve is not mandatory for private operations.

Further detail and guidance, including requirements for IFR and charter flights, is available in CAAP 234-1(2).
Fuel planning

Pre-flight planning CAR 234, CAAP 234-1(2)

Refer to the AFM or POH to find:

- total fuel capacity
- useable fuel
- fuel consumption rates

To determine how much fuel you need, consider:

- the distance to be travelled to reach the proposed destination;
- the meteorological conditions in which the aircraft is, or may be required to, fly;
- where applicable, the possibility of:
  - a forced diversion to an alternative aerodrome
  - a delay pending landing clearance
  - air traffic control re-routing the flight after commencement of the flight
  - relevant NOTAMS
  - a loss of pressurisation in the aircraft
  - where the aircraft is a multi-engined aircraft – an engine failure
- mandatory fixed fuel reserves

Familiarise yourself with the aircraft’s fuel systems to know:

- whether the engine is fuel injected or fitted with a carburettor
- where to leave the fuel selector valve when parked:
  - both
  - left (or right) or
  - in the off position

Check fuel availability en-route and note suppliers and operating hours (refer to ERSA). Never plan to use fixed reserve fuel.
### Pre-flight inspection

Establishing the amount of fuel on board can be difficult, especially in smaller aircraft. To gain accurate fuel quantities, if tanks are partially full, the aircraft should ideally be on level ground and you should use the manufacturer’s accurately graduated dipstick, sight gauge, drip gauge or tank tab.

Try to refuel on level ground to avoid inaccurate fuel measurements and unwanted fuel transfer. Note the procedures that may be set out in the AFM or POH, especially regarding the positioning of the fuel selector valve.

Dip each tank to check the amount of fuel. If the tank is partially filled, any direct reading must be either discounted or rounded down to a figure consistent with the next lower tab or marking. However, direct readings of a partially filled tank may be used if the aircraft is level and:

- the fuel is at or above a tab with a clearly established value or
- the fuel gauge reading corresponds to a dipstick value.

Before starting the aircraft engine, you should cross-check fuel amounts by at least two separate methods. If you are not assured that the aircraft tanks are completely full, or a totally reliable and accurately graduated dipstick, sight gauge, drip gauge or tank tab reading can be done, consider the following methods:

- check of visual readings (tab, dip, drip, sight gauges) against fuel consumed indicator readings
- having regard to previous readings, a check of electrical gauge or visual readings against fuel consumed indicator readings
- after refuelling, and having regard to previous readings, a check of electrical gauge or visual readings against the refuelling installation readings
- where a series of flights is undertaken by the same pilot and refuelling is not carried out at intermediate stops, cross-checks may be made by checking the quantity gauge readings against computed fuel on board and/or fuel consumed indicator readings, provided the particular system is known to be reliable.

As part of a daily inspection, (CAR Schedule 5 Part 1):

- ensure drains and vents are working properly
- ensure, if using AVGAS, to rock the aircraft to move trapped water over the drain point before carrying out a fuel drain (refer aircraft manufacturer’s recommendations)
- check for contaminants, particularly water; and correct fuel type. Ensure the fuel filler cap is secure and sealed.
**In flight**

At regular intervals the pilot in command must compare fuel remaining with planned figures and should monitor tank selection. Checking at least every 30 minutes and at turning points is recommended.

Use planned power settings and correct mixture leaning technique (at all altitudes) and make sure gauge readings are conducted per the aircraft’s fuel calibration card.

If you find that insufficient fuel remains to continue with the planned flight to land with your fixed fuel reserves intact, you must re-plan to an alternative safe landing area.

An aircraft is considered to be in an emergency situation when the useable fuel predicted to be available upon landing at the nearest safe landing area will be less than the fixed fuel reserve.

If no option exists where a landing can be accomplished at a safe landing area with fixed fuel reserves intact, the pilot in command must declare a fuel emergency state by broadcasting: MAYDAY, MAYDAY, MAYDAY FUEL. This ensures that others operating in your vicinity and ATC are made aware of your situation and afford you priority to land.

**Post flight**

Compare usage figures with planned figures when next refuelling.

**Scenario – Piston single-engine aircraft (Essendon to Swan Hill)**

The flight is a private day piston single-engine flight from Essendon to Swan Hill. The quantity of usable fuel required to be on board at the commencement of the flight.

The quantity of usable fuel required to be on board at the commencement of flight.
## Fuel analysis table

<table>
<thead>
<tr>
<th>Fuel calculation</th>
<th>Time (min)</th>
<th>Fuel (lbs)</th>
<th>Fuel (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Taxi fuel (not a component of trip fuel)</td>
<td>–</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Take off</td>
<td>–</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Climb</td>
<td>16</td>
<td>29</td>
<td>18</td>
</tr>
<tr>
<td>Cruise</td>
<td>57</td>
<td>76</td>
<td>48</td>
</tr>
<tr>
<td>Descent and approach</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>2</strong> Total trip fuel</td>
<td>73</td>
<td>111</td>
<td>70</td>
</tr>
<tr>
<td><strong>3</strong> Variable fuel (% of <strong>2</strong>)</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>4</strong> Alternate fuel</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>5</strong> Fixed reserve</td>
<td>30</td>
<td>30</td>
<td>19</td>
</tr>
<tr>
<td><strong>6</strong> Additional fuel</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>7</strong> Holding fuel</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>8</strong> Fuel required ($1 + 2 + 3 + 4 + 5 + 6 + 7$)</td>
<td>103</td>
<td>147</td>
<td>93</td>
</tr>
<tr>
<td><strong>9</strong> Discretionary fuel</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>10</strong> Fuel margin</td>
<td>297</td>
<td>396</td>
<td>251</td>
</tr>
<tr>
<td><strong>11</strong> Endurance ($8 + 9 + 10$)</td>
<td>400</td>
<td>543</td>
<td>344</td>
</tr>
</tbody>
</table>

### Private Day VFR flight:

**Essendon to Swan Hill**

- **Trip**: 111 lbs
- **Taxi**: 6 lbs
- **Fixed**: 30 lbs
- **Margin**: 396 lbs
- **Fuel Capacity**: 543 lbs
- **Required Fuel**: 147 lbs
Time

Introduction
Australia uses Coordinated Universal Time (UTC) for all civil aviation operations (AIP GEN 2.1).

The term ‘Zulu’ is used when ATC procedures require a reference to UTC, for example:

- 0920 UTC is said as ‘zero nine two zero zulu’
- 0115 UTC is said as ‘zero one one fife zulu’

Converting from Standard Time to UTC

<table>
<thead>
<tr>
<th>Standard Time</th>
<th>UTC Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Standard</td>
<td>Subtract 10 hours</td>
</tr>
<tr>
<td>Central Standard</td>
<td>Subtract 9.5 hours</td>
</tr>
<tr>
<td>Western Standard</td>
<td>Subtract 8 hours</td>
</tr>
</tbody>
</table>

Note—Daylight saving is not applied universally across Australia and is not published in the AIP. See AIP SUP and NOTAM Daylight Saving.

The 24-hour clock system is used in radiotelephone transmissions. The hour is indicated by the first two figures and the minutes by the last two figures. For example:

- 0001 is said as ‘zero zero zero one’
- 1920 is said as ‘one nine two zero’

Time may be stated in minutes only (two figures) in radiotelephone communications when no misunderstanding is likely to occur. Current time in use at a station is stated to the nearest minute in order that pilots may use this information for time checks.

Control towers will state time to the nearest half minute when issuing a taxi clearance to a departing aircraft. For example:

- 0925:10 is said as ‘time, two fife’
- 0932:20 is said as ‘time, three two and a half’
- 2145:50 is said as ‘time, four six’.
Pre-flight planning – Preparation – Time

Coordinated Universal Time

Time format

Date and time are indicated in a combination of the date and time in a single six-figure group. However, a 10-figure group comprising the year, month, date, hours and minutes is used for NOTAMs and SUPs. This is reduced to an eight-figure group (nil year) for a specific pre-flight information bulletin (SPFIB). The format is yymmddhhmm. For example:

1215 hours UTC on 23 March 2010 would be written as 1003231215
Daylight and darkness

Daylight and darkness AIP GEN 2.7

‘Night’ is that period between the end of the evening civil twilight and the beginning of the morning civil twilight. For all intents and purposes, first light should be construed as the beginning of civil twilight and last light as the end of civil twilight. The terms ‘sunrise’ and ‘sunset’ have no relevance when calculating daylight operating times for the VFR pilot.

Note—Sunrise, sunset and civil twilight times (first and last light) can also be obtained from www.ga.gov.au/geodesy/astro/sunrise.jsp.

To compute the beginning or end of daylight using the graphs contained in this section:

• enter the top or bottom of the scale at the appropriate date (each line represents five-day increments)
• move vertically up or down to the curve for the latitude of the place concerned (interpolating for intermediate latitudes if necessary)
• move horizontally to the left or to the right and read local mean time on the vertical scale at the side
• to convert to UTC, subtract (in E longitudes) from the LMT obtained, the time increment corresponding to the longitude of the place concerned in the Conversion of arc to time table
• to convert to EST, add 10 hours to UTC
• to convert to CST, add 9.5 hours to UTC and
• to convert to WST, add 8 hours to UTC.

When using these graphs, note that the parameters used in compiling them do not include the nature of the terrain surrounding a location, or the presence of other than a cloudless sky and unlimited visibility at that location.

Consequently, cloud cover, poor visibility or high terrain to the west of an aerodrome will cause daylight to end at a time earlier than that extracted from the appropriate graph. Allowance should be made for these factors when planning a flight having an ETA near the end of daylight.

NAIPS automatically computes first light and last light. This information can be provided through pilot access, as part of a telephone briefing, or from Flightwatch.
Local time

Local time in Australia falls into three separate zones:

<table>
<thead>
<tr>
<th>Time Zone</th>
<th>UTC Offset</th>
<th>Geographic Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>EST</td>
<td>UTC + 10 hours</td>
<td>New South Wales (except the Broken Hill area), Queensland, Victoria, Tasmania and the Australian Capital Territory</td>
</tr>
<tr>
<td>CST</td>
<td>UTC + 9.5 hours</td>
<td>South Australia, the Northern Territory and the Broken Hill area</td>
</tr>
<tr>
<td>WST</td>
<td>UTC + 8 hours</td>
<td>Western Australia</td>
</tr>
</tbody>
</table>

However, certain states introduce local summer time each year between October of that year and March of the following year, which adds an additional hour to the local time applicable in that state.

A notice to airmen (NOTAM) or aeronautical information publication (AIP) supplements will be issued detailing revised hours of operation for those aeronautical facilities affected by local time changes during periods of State Summer Time and which do not have such hours publicised in AIP.

Time of last light AIP GEN 2.7

Worked example

Find the time of last light for a location at (360900S 1444600E) on 20 November.

Solution

Use the Time of last light April to September chart and Arc to time conversion table:

1. Using the Time of last light chart, enter at 20 November and follow downward until reaching latitude 36° (by interpolation) then straight across to read off Local Mean Time (LMT) = 1919.

2. To convert to UTC, using the Arc to time conversion table, find longitude 144° = 9h 36m.

3. Add the increment corresponding to 46° in the right hand column = 3’ 04” + 0936 = 0939.

4. Subtract the arc to time from the LMT to give the time of last light in UTC: 1919-0939 = 0940 UTC

Location  Echuca
Date  20 November
Lat/Long  S36 09.0 E144 46.0
### Time of first light April to September

| Month | 1   | 10  | 20  | 30  | 1   | 10  | 20  | 30  | 1   | 10  | 20  | 30  | 1   | 10  | 20  | 30  | 1   | 10  | 20  | 30  |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| LMT   | 0640| 0650| 0700| 0710| 0530| 0540| 0550| 0600| 0610| 0620| 0630| 0640| 0650| 0700| 0710| 0530| 0540| 0550| 0600|
| LAT   | 10º | 20º | 30º | 40º | 45º | 45º | 45º | 45º | 45º | 45º | 45º | 45º | 45º | 45º | 45º | 45º | 45º | 45º | 45º |

### Time of first light October to March

| Month | 1   | 10  | 20  | 30  | 1   | 10  | 20  | 30  | 1   | 10  | 20  | 30  | 1   | 10  | 20  | 30  | 1   | 10  | 20  | 30  |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| LMT   | 0530| 0540| 0550| 0600| 0530| 0540| 0550| 0600| 0610| 0620| 0630| 0640| 0650| 0700| 0710| 0530| 0540| 0550| 0600|
| LAT   | 0º  | 10º | 20º | 30º | 35º | 35º | 35º | 35º | 35º | 35º | 35º | 35º | 35º | 35º | 35º | 35º | 35º | 35º | 35º |
Time of last light April to September

Time of last light October to March
### Arc to time conversion AIP GEN 2.7

<table>
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<tr>
<th>Degrees</th>
<th>Time</th>
<th>Degrees</th>
<th>Time</th>
<th>Minutes</th>
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</table>
Charts

AIP GEN 3.2

**Charts available (but not limited to)**

**VFR**
- Planning Chart Australia (PCA)
- World Aeronautical Chart (WAC)
- Visual Terminal Chart (VTC)
- Visual Navigational Chart (VNC)

**IFR**
- En Route Chart – Low (ERC–L)
- En Route Chart – High (ERC–H)
- Terminal Area Chart (TAC)
- Aerodrome (AD) Chart

**Airservices store**
Airservices Publication Service  T: 1300 306 630  W: www.airservicesaustralia.com/store

**Planning Chart Australia**

PCA depicts the following information:
- GAF boundaries
- WAC coverage and chart titles
- Location names and abbreviations
- Estimated FIS VHF coverage at 5000 ft and 10,000 ft and
- HF network boundaries.

**Visual charts**

World Aeronautical Charts (WACs) (scale 1:1,000,000) are designed for pre-flight planning and pilotage. They are constructed on Lambert’s Conformal Conic Projection. Australian coverage is shown on the front of each chart.

Visual Navigation Charts (VNCs) (scale 1:500,000) are designed for VFR operations. They contain an aeronautical overlay of controlled airspace over a topographical base, and contain some radio communication and other navigational data appropriate for visual navigation. Map coverage is shown on the front of each map.

Visual Terminal Charts (VTCs) (scale 1:250,000) are designed for visual operations near terminal areas. They contain some topographical detail and appropriate airspace, radio communication and navigation aid information. VTCs are intended for use up to and including FL180.

**Note**—When planning visual navigation outside the coverage of VTCs, pilots will need to refer to the appropriate VNC (if available) or IFR chart ERC-L for depiction of controlled airspace and prohibited, restricted and danger areas (AIP GEN 3.2).
En-route charts and terminal area charts

ERCs-L, ERCs-H and TACs are presented at various scales and depict airspace, air routes and radio navigation facilities.

ERCs-L are intended for use primarily up to and including FL200. ERCs-L show an outline of the areas covered by TACs and VTCs. These areas impact on the ERC-L presentation as follows:

- within the areas covered by TACs, full details of air routes may not be shown due to lack of space
- air route information within these areas will usually only include the route line and bearing. Where space permits, the route designator, distance and LSALT may also be shown and
- within the areas covered by TACs and VTCs, full details of airspace may not be shown. Information may only indicate lateral boundaries. Restricted and danger area numbers and sport aviation symbols may not be shown.

For complete details of aeronautical data in these areas refer to the appropriate TACs or VTCs.

ERCs-H are intended to be used for operations above FL200.

TACs show details applicable to both high and low level operations in terminal areas. Aerodrome charts, apron charts, noise abatement procedures, SID charts, STAR charts, DME and GPS Arrival charts and IAL charts are IFR charts and are published in DAP East and DAP West (AIP GEN 3.2).

Restricted and danger areas

Restricted and danger areas are depicted as follows:

- On all charts, restricted areas are shown with a magenta verge. See the RA conditional status (see AIP ENR 1.4) displayed on the chart with association to the RA. ERSA-PRD AREA outlines each code and its meaning.
- On the ERCs and TACs, danger areas are shown with a solid magenta line.
- On the VTCs, danger areas are shown with a solid magenta line with a magenta dotted verge along the inside of its boundary.
- On all charts where a restricted and danger area have a common lateral boundary, only the restricted area verge is shown. The danger area boundary is indicated by labels (AIP GEN 3.2).
Airspace boundary information

Distances associated with airspace boundaries indicate the datum on which the airspace is based, and are shown as follows:

- ‘NM’ indicates a distance from the aerodrome reference point;
- ‘DME’ or ‘TAC’ indicates a distance based on a particular navigation aid (DME or TACAN), and
- Some control zones have boundaries based on a runway threshold. For example:
  
  ‘7 NM FM THR RWY 33’ indicates a distance based on the threshold of Runway 33 at the associated aerodrome (AIP GEN 3.2).

Frequency information

Flight information area (FIA) boundaries and frequencies are depicted in green. ATC frequencies and the associated boundaries for use in Class E airspace are depicted in brown (AIP GEN 3.2). The prefix to a frequency indicates the provider of the service. Where a single area is divided vertically between different frequencies, the vertical limits applicable to each frequency will be indicated.

Depiction of common traffic advisory frequency (CTAF) AIP GEN 3.2

At non-controlled aerodromes where MULTICOM 126.7MHz is not the CTAF, or non-controlled aerodromes that have an associated navaid, an entry “CTAF” followed by the designated frequency, is annotated in a box associated with the location. Radio carriage is required at all non-controlled aerodromes which are identified in the ERSA as being certified, registered or military. ERSA should always be consulted as part of the pre-flight planning process before operating at non-controlled aerodromes.

Broadcast areas AIP GEN 3.2

Broadcast areas are defined airspace volumes in Class G airspace for which a discrete frequency (CTAF) has been allocated. All operations, including those at aerodromes (charted and uncharted) and landing sites within this area shall use this CTAF as the broadcast frequency. Broadcast Areas are depicted on charts by a dotted dark green line and a label stating ‘for operations in this area SFC <altitude> use CTAF <frequency>’. The vertical boundaries of a Broadcast Area are:

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

An example of a broadcast area is located in the Redcliffe (YRED) area in Queensland.
Prohibited, restricted and danger areas

**Requirements** AIP ENR 1.4

You must not fly an aircraft over a prohibited area in any circumstances.

You must not fly an aircraft over a restricted area if the flight is not in accordance with conditions published in AIP (ERSA and DAH) and NOTAM. To obtain access to a restricted area or airspace, you must request approval from the controlling authority (see ERSA PRD). When an ATC service is available within that airspace, approval may be requested from ATC directly, in the same manner as a clearance request to enter CTA.

Restricted areas have been allocated an RA conditional status, which should be checked during pre-flight planning. Conditional statuses are as follows:

- **RA1**: pilots may flight plan through the restricted area and under normal circumstances expect a clearance from ATC;
- **RA2**: pilots must not flight plan through the restricted area unless on a route specified in ERSA GEN FPR or under agreement with the Department of Defence. However, a clearance from ATC is not assured. Other tracking may be offered through the restricted area on a tactical basis and
- **RA3**: pilots must not flight plan through the restricted area and clearances will not be available.

If the RA status is not known, treat it as RA3 and avoid the area.

Civil aircraft in restricted area or airspace will receive a service equivalent to that of Class C airspace unless specified otherwise in ERSA FAC or NOTAM.

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

When compliance with ATC requires flight through an adjoining restricted area, you may assume that ATC has obtained approval for the flight (AIP ENR 1.4).

If you find that the aircraft is over a prohibited area or a restricted area in contravention of the requirements noted above, you shall:

- immediately fly the aircraft out of the area
- as soon as possible report the circumstances to the nearest ATC unit
- land at such aerodrome as is designated by the ATC unit and, for that purpose, obey any instructions given by the ATC unit as to the movement of the aircraft.

A danger area (DA) is designated where an activity within or over the area is a potential danger to aircraft flying over the area. While no approval is required to fly through a DA, pilots are encouraged to be particularly vigilant if electing to do so. Examples include: flying training, gliding competitions, parachuting activities, mine blasting, high velocity plume rise and small arms firing.
Meteorology

Services

**Weather radar** AIP GEN 3.3

Weather radar data derived from BoM radar sites is displayed at various ATS positions and available to pilots on request, subject to ATS workload. ATS will only provide weather radar information to pilots within 75NM of the weather radar site and will prefix information with “MET RADAR DISPLAY INDICATES...” Weather radar sites available to ATS are shown in *ERSA MET*.

Weather radar images are not ‘real time’, but are the results of a ten minute update cycle.

**Meteorological briefing** AIP GEN 3.5

A limited elaborative briefing service is available from regional forecasting centres (RFCs) and meteorological offices on the following telephone numbers:

<table>
<thead>
<tr>
<th>Location</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adelaide</td>
<td>08 8366 2617</td>
</tr>
<tr>
<td>Brisbane</td>
<td>07 3229 1854</td>
</tr>
<tr>
<td>Cairns</td>
<td>07 4034 9437</td>
</tr>
<tr>
<td>Canberra</td>
<td>02 6249 6579</td>
</tr>
<tr>
<td>Darwin</td>
<td>08 8920 3814</td>
</tr>
<tr>
<td>Hobart</td>
<td>03 6221 2026</td>
</tr>
<tr>
<td>Melbourne</td>
<td>03 9669 4850</td>
</tr>
<tr>
<td>Perth</td>
<td>08 9263 2255</td>
</tr>
<tr>
<td>Sydney</td>
<td>02 9296 1527</td>
</tr>
</tbody>
</table>

**Meteorological documentation** AIP GEN 3.5

Available documents include the following:

- surface synoptic charts
- forecast upper level charts
- satellite imagery
- grid point winds and temperatures
- route sector winds and temperatures
- significant weather charts
- graphical area forecasts (GAFs)
- domestic TAFs and TTFs.
Forecasts

Notification required from operators for domestic operations
All meteorological information issued on a routine basis and held by the briefing office concerned is available without prior notice. Eight hours of notice is required for non-routine forecasts (AIP GEN 3.5).

Forecast for flights—valid graphical area forecasts (GAFs) not available
AIP GEN 3.5
Flight forecasts required for flights for which valid GAFs are not available will be supplied subject to the request being received three days before departure and forecaster capacity to provide the service. However, every effort will be made to expedite MET documentation for mercy and SAR flights. Notification should include the following information as applicable:

- departure aerodrome and estimated off blocks time (EOBT)
- destination and ETA
- route
- ETAs and EOBTs for intermediate stopping places
- heights for upper winds and temperatures
- time documentation required.
Forecasts and reports

**Significant abbreviations** AIP GEN 3.5

In reports, forecasts and graphical area forecasts (GAFs), the amount of cloud is indicated by the following abbreviations:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
<th>Amount of Cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>SKC</td>
<td>Sky clear</td>
<td>nil</td>
</tr>
<tr>
<td>FEW</td>
<td>Few</td>
<td>1 to 2 OKTAS</td>
</tr>
<tr>
<td>SCT</td>
<td>Scattered</td>
<td>3 to 4 OKTAS</td>
</tr>
<tr>
<td>BKN</td>
<td>Broken</td>
<td>5 to 7 OKTAS</td>
</tr>
<tr>
<td>OVC</td>
<td>Overcast</td>
<td>8 OKTAS</td>
</tr>
<tr>
<td>NSC and CAVOK</td>
<td>Nil significant cloud</td>
<td></td>
</tr>
</tbody>
</table>

The only cloud types that are included in aeronautical code format are towering cumulus (TCU) and cumulonimbus (CB). Forecasts, such as graphical area forecasts (GAFs), will also include cloud types other than CB and TCU when appropriate; and in the case of CB cloud, the amount will be indicated in ‘non-aerodrome’ type forecasts as follows:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISOL</td>
<td>Isolated</td>
<td>For individual CBs</td>
</tr>
<tr>
<td>OCNL</td>
<td>Occasional</td>
<td>For well-separated CBs</td>
</tr>
<tr>
<td>FREQ</td>
<td>Frequent</td>
<td>For CBs with little or no separation</td>
</tr>
</tbody>
</table>

>10KM is used in the visibility section of graphical area forecasts (GAFs) to indicate a visibility greater than 10 km over the entire area. When weather elements are forecast to reduce the visibility below 10 km, the weather and associated visibilities are given. Note that the visibility remains greater than or equal to 10 km in parts of the area unaffected by those elements (AIP GEN 3.5).
## Weather code and translation (AIP GEN 3.5)

### Weather descriptors

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC</td>
<td>Patches (or patches of)</td>
</tr>
<tr>
<td>BL</td>
<td>Blowing</td>
</tr>
<tr>
<td>DR</td>
<td>Drifting</td>
</tr>
<tr>
<td>FZ</td>
<td>Freezing</td>
</tr>
<tr>
<td>MI</td>
<td>Shallow</td>
</tr>
<tr>
<td>SH</td>
<td>Showers (or showers of)</td>
</tr>
<tr>
<td>TS</td>
<td>Thunderstorms (or thunderstorms with)</td>
</tr>
<tr>
<td>PR</td>
<td>Aerodrome partially covered (used only to describe FG)</td>
</tr>
</tbody>
</table>

### Phenomena

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BR</td>
<td>Mist</td>
</tr>
<tr>
<td>DU</td>
<td>Dust</td>
</tr>
<tr>
<td>DS</td>
<td>Dust storm</td>
</tr>
<tr>
<td>DZ</td>
<td>Drizzle</td>
</tr>
<tr>
<td>FC</td>
<td>Funnel clouds</td>
</tr>
<tr>
<td>FG</td>
<td>Fog</td>
</tr>
<tr>
<td>FU</td>
<td>Smoke</td>
</tr>
<tr>
<td>GR</td>
<td>Hail</td>
</tr>
<tr>
<td>GS</td>
<td>Small hail pellets</td>
</tr>
<tr>
<td>HZ</td>
<td>Haze</td>
</tr>
<tr>
<td>PL</td>
<td>Ice pellets</td>
</tr>
<tr>
<td>PO</td>
<td>Dust devils</td>
</tr>
<tr>
<td>RA</td>
<td>Rain</td>
</tr>
<tr>
<td>SA</td>
<td>Sand</td>
</tr>
<tr>
<td>SG</td>
<td>Snow grains</td>
</tr>
<tr>
<td>SN</td>
<td>Snow</td>
</tr>
<tr>
<td>SQ</td>
<td>Squalls</td>
</tr>
<tr>
<td>SS</td>
<td>Sand storm</td>
</tr>
<tr>
<td>UP</td>
<td>Unknown precipitation (from weather sensor)</td>
</tr>
<tr>
<td>VA</td>
<td>Volcanic ash</td>
</tr>
</tbody>
</table>

### Notes

1. Intensity is indicated with precipitation, duststorms and sandstorms. In these cases, the weather code is prefixed by the qualifier ‘-‘ for light, or ‘+‘ for heavy. Moderate intensity is indicated by the absence of a prefix.

2. METAR/SPECI may provide an indication of weather in the vicinity (within approximately 8–16 km of the aerodrome reference point). The proximity qualifier ‘VC‘ will be used only in combination with the abbreviations: TS, DS, SS, FG, FC, SH, PO, BLDU, BLSA and BLSN.
Forecast terminology

**TEMPO, INTER, FM and BECMG** AIP GEN 3.5

TEMPO and INTER indicate significant variations, from the previous given mean conditions, of a temporary or intermittent nature, expected during the period which is given in:

- **TAF format:** ddhh/ddhh,
  for example: **0108/0114** means from 08 until 14 UTC on the 1st or
- **TTF format:** hhmm/hhmm,
  for example: **0630/0900** means from 0630 until 0900 hours UTC.

**TEMPO** is used when variations from the forecast mean conditions are expected to last for 30 minutes or more but less than 60 minutes in each instance, and which in the aggregate are not expected to cover more than half the given period. For instance, the variations take place sufficiently infrequently such that the mean conditions remain those of the preceding part of the forecast.

**INTER** is used when variations from the forecast mean conditions are expected to last for periods less than 30 minutes in each instance and which, in the aggregate, are not expected to cover more than half the given period. For instance, the variations take place sufficiently infrequently such that the mean conditions remain those of the preceding part of the forecast (AIP GEN 3.5).

The change groups FM (from) and BECMG (becoming) are used when significant changes (both deteriorations and improvements) from the preceding information that are more lasting in nature.

**FM** is used when rapid changes are expected at the specified time, and is given in:

- **TAF format:** FMddhhmm,
  for example: **FM301000** means from 1000 UTC on the 30th or
- **TTF format:** FMhhmm,
  for example: **FM1815** means from 1815 UTC.

**BECMG** is used (in TAF only) when the changes are expected to develop at a regular or irregular rate during the specified time period, and is given in:

- **TAF format:** BECMG ddhh/ddhh,
  for example: **BECMG 3010/3011** means between 1000 and 1100 UTC on the 30th.

In both cases (FM and BECMG), the new conditions will continue until the end of the validity period of the TAF/TTF, or until replaced by another FM or BECMG.
Sun and rain illustrating an FM period

Cloud height datum
In aerodrome and trend forecasts, cloud heights are given above aerodrome elevations. In other forecasts, heights are expressed:

- as a flight level or
- with reference to mean sea level.

Forecast amendments
Amendments (AMD) to forecasts are issued as necessary when changes are expected during the period of validity of a given forecast.

Graphical area forecasts (GAF)

Graphical area forecasts (GAF) for operations surface to 10,000ft AIP GEN 3.5
These domestic forecasts are issued for aircraft operations at or below 10,000ft. They comprise of an image and supporting text detailing the meteorological conditions. GAFs are prepared and issued for the 10 areas as detailed on AUS PCA.

A flight forecast (text based forecasts) may be issued for any part of a flight for which a routine GAF is not prepared.

These forecasts are available from the ATS automated briefing systems, and briefing offices listed in ERSA GEN.
Pre-flight planning – Meteorology – Graphical area forecasts (GAF)

**GAF areas**

- GAFs are issued with the 6 hour validity periods 2300Z to 0500Z, 0500Z to 1100Z, 1100Z to 1700Z and 1700Z to 2300Z
- At each issue time two GAFs will be issued covering a 12 hour period, for example at 2200Z, both 2300Z to 0500Z and 0500Z to 1100Z GAFs will be issued
- GAFs will be issued no later than 30min before the commencement of the validity period of the first GAF
- the issuance of a new GAF replaces the previously issued GAF for the same validity period.
Approved abbreviations used in graphical area forecasts (GAF)

<table>
<thead>
<tr>
<th>Clouds</th>
<th>CU, TCU, SC, CB, ST, AS, AC, NS or combinations of these</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather</td>
<td>CAVOK, MTW, NIL, TURB, and other abbreviations</td>
</tr>
<tr>
<td>Cloud amounts or descriptors</td>
<td>FEW, SCT, BKN, OVC and for CB, ISOL, OCNL, FRQ, EMBD, BASE, CLD ON GND</td>
</tr>
<tr>
<td>Qualifiers</td>
<td>MOD, SEV, +, –</td>
</tr>
<tr>
<td>Units</td>
<td>KT, KM, M, FT</td>
</tr>
<tr>
<td>Time</td>
<td>Z.</td>
</tr>
<tr>
<td>Variations</td>
<td>TEMPO and INTER are only used for critical locations. FM, TL, BECMG</td>
</tr>
<tr>
<td>Heights</td>
<td>ABV, BLW, Lyr, SFC</td>
</tr>
<tr>
<td>Directions</td>
<td>N, NE, E, SE, S, SW, W, NW</td>
</tr>
<tr>
<td>Corrections</td>
<td>COR (correction), IMPR (improvement to conditions), TRANS ERR (transmission error), TYPO (typographical error).</td>
</tr>
<tr>
<td>General</td>
<td>FZLVL, FZLYR, WDSPR, WI, VAL, STNR, BTN and other abbreviations listed in AIP GEN 2.2 section 2.</td>
</tr>
</tbody>
</table>

Sections of the graphical area forecast (GAF)

The GAF shall comprise of:

- a header giving details of issue time and validity times. It will also contain the word “CORRECTED” for a GAF correction
- an image depicting weather areas labelled with an alpha character, e.g. A. Weather areas may be subdivided further with addition of a numerical character, e.g. A1. The weather in A1 will be the same as A with a minor differentiation, such as lower visibility in showers
- a table providing detailed meteorological information for the areas shown on the image divided into four columns:
  - AREA gives the alpha character corresponding to areas in the image
  - SURFACE VIS and WX gives details of weather and associated visibility
  - CLOUD, ICING and TURB gives the cloud, icing and turbulence in the area or associated with the weather in the SURFACE VIS and WX column
  - FZLVL gives the height of the freezing level, or ABV 10,000ft where the freezing level is above 10,000ft AMSL
• a legend explaining information important to the interpretation of the product
• a remarks box for additional information including forecasts for critical locations and reason for correction for a corrected GAF.

Changes to GAFs and corrected GAF

GAFs are not amended. Advice of deteriorating conditions will be in the form of an AIRMET or SIGMET. A corrected GAF will be issued between standard issue times to notify of:
• Typographical error (TYPO)
• Errors such as transmitting before completion (TRANS ERR) and
• Improvement in conditions (IMPR) – e.g. removal of fog, thunderstorms, etc.

An example GAF is given below:
Grid point wind and temperature (GPWT) forecasts

**Grid point wind and temperature (GPWT) forecasts** AIP GEN 3.5

GPWT charts provide a display of wind and temperature data derived from weather model data. The high-level and mid-level charts are produced with a 2.5° or 5° latitude and longitude grid resolution using data from the world area forecast system (WAFS) models.

The low level charts are produced with a 1.5° or 5° latitude and longitude grid resolution using data from the Bureau of Meteorology’s numerical weather prediction model. The data is overlaid on a geographic background. The values given represent the wind and temperature at a specific pressure level, which is approximated to a height or flight level, for the mid-point of each square.

GPWT are presented to aircrew on a geographic background to facilitate interpretation on specific routes.

A block of GPWT data contains the following information for each level:

- dd: two numbers indicating the wind direction in degrees true to the nearest 10
- fff: three numbers indicating the wind speed in knots
- t: the sign of the temperature (+ or -)
- TT: two numbers indicating the temperature in whole degrees celsius. Dashed line (— — —) are used when the grid point is below ground level and hence there is no valid wind or temperature for that point.

**Example**

<table>
<thead>
<tr>
<th>2503563</th>
<th>dd</th>
<th>fff</th>
<th>tTT</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>035</td>
<td>-63</td>
<td></td>
</tr>
</tbody>
</table>

GPWT forecasts are issued every six hours. High-level and mid-level charts are valid in six hourly time steps for the next 24 hours, however, low level charts are valid in three hourly time steps for the next 24 hours.

Receipt of a forecast for a particular validity time will automatically amend and supersede any prior issue for that time. Both issue and validity times appear with each forecast.
### Example of grid point forecast presentation

<table>
<thead>
<tr>
<th>Grid Point</th>
<th>140°E</th>
<th>141°E</th>
<th>142°E</th>
<th>150°E</th>
<th>151°E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid Point</td>
<td>30 02</td>
<td>30 02</td>
<td>30 02</td>
<td>30 02</td>
<td>30 02</td>
</tr>
<tr>
<td>29 02</td>
<td>29 02</td>
<td>29 02</td>
<td>29 02</td>
<td>29 02</td>
<td>29 02</td>
</tr>
<tr>
<td>28 02</td>
<td>28 02</td>
<td>28 02</td>
<td>28 02</td>
<td>28 02</td>
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<tr>
<td>27 02</td>
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<td>26 02</td>
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<td>25 02</td>
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<td>19 02</td>
<td>19 02</td>
<td>19 02</td>
<td>19 02</td>
<td>19 02</td>
<td>19 02</td>
</tr>
</tbody>
</table>

**GPWT FORECASTS (1000FT - FL140) - NSW**

Provided by Aerological Bureau for the USA - METEOROLOGY

| VALID | 0000 UTC 27 Jul 2018 |
| ISSUED: | 2030 UTC 26 Jul 2018 |
| DATA FORMAT: | 45 19 18 19 19 19 |
| AIR: | WIND OR TENS OF DEG TRUE |
| FT: | WIND SPEED IN KNOTS |
| FF: | EMB IN DEG CELSIUS |

Forecast is valid for the center of the box.
Aerodrome forecasts

Aerodrome forecasts (TAF) AIP GEN 3.5

Aerodrome forecasts are a statement of meteorological conditions expected for the specified period in the airspace within a radius of five nm of the aerodrome reference point.

The TAF service provided is in accordance with the airfield category, the category of airfield being determined by the type and the amount of traffic.

<table>
<thead>
<tr>
<th>Category</th>
<th>Aerodrome type</th>
<th>Routine TAF service</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>International</td>
<td>Issued 6 hourly, valid for 24 or 30 hours. Commencement times 00, 06, 12 and 18 UTC.</td>
</tr>
<tr>
<td>B</td>
<td>Major domestic</td>
<td>Issued 6 hourly, valid for 12 or 18 hours. Commencement times 00, 06, 12, 18 UTC.</td>
</tr>
<tr>
<td>C</td>
<td>Medium</td>
<td>Issued 6 hourly, typically valid for 12 hours. Commencement times are 02, 08, 14 and/or 20 UTC, except in Western Australia where commencement times are 04, 10, 16 and/or 22 UTC.</td>
</tr>
<tr>
<td>D</td>
<td>Small</td>
<td>Issued 6 or 12 hourly, valid for up to 12 hours. Commencement times are typically 20 and/or 02 UTC, except in Western Australia where commencement times are typically 22 and/or 04 UTC.</td>
</tr>
</tbody>
</table>

Notes
1. Commencement times for C and D TAFs will be one hour earlier in states using daylight saving.
2. TAF will be provided upon request for other locations in support of SAR and emergency flights.
### TAF (aerodrome forecast) format AIP GEN 3.5

#### TAF or TAF AMD or TAF COR
- **Location**
- **Issue time**
- **Validity**
- **NIL**
- **CNL**
- **VIS**
- **WX**
- **CLD**
- **CAVOK**

#### Significant changes to mean conditions
- **FM or BECMG**
- **Time**
- **Wind**
- **VIS**
- **WX**
- **CLD**
- **CAVOK**

#### Significant variations from mean conditions
- **INTER or TEMPO**
- **Start time**
- **Finish time**
- **Wind**
- **VIS**
- **WX**
- **CLD**

#### Probability of TS or poor visibility
- **PROB % (30 or 40%)**
- **INTER or TEMPO**
- **Start time**
- **Finish time**
- **VIS**
- **TS**
- **CLD**
- **Fog, mist, dust, smoke or sand**

#### Significant low level turbulence
- **FM**
- **Start time**
- **MOD TURB or MOD/SEV TURB or SEV TURB**
- **BLW...FT**
- **TILL**
- Finish time

#### Other elements
- **TEMP**
- **QNH**
- Not used for fog
- Inter or Tempo only used for TS

#### The following lines will only be included as required
- Indicates elements which may or may not be included in line.
METAR/SPECI (aerodrome weather report) format

Aerodrome weather and forecast decode AIP GEN 3.5

**Identifier**

METAR is used to identify routine observations (hourly or half-hourly) when conditions are above specified levels. SPECI is used to identify special observations, that is, observations when conditions are below specified criteria, or when there have been significant changes since the previous report. SPECI is also used to identify observations reported 10 minutes following an improvement to above SPECI conditions.

TTF METAR or TTF SPECI is used to identify METAR or SPECI to which a trend forecast is appended. The use of this identifier is restricted to those locations that issue Trend Forecasts.

TAF, TAF AMD, TAF COR, TAF... CNL, TAF... NIL and PROV TAF are used to identify Aerodrome Forecast, Amended Aerodrome Forecast, Corrected Aerodrome Forecast, Cancelled Aerodrome Forecast, Nil Aerodrome Forecast and Provisional Aerodrome Forecast respectively.

For message formats, see AIP GEN sections 14 (METAR/SPECI), 15 (TAF) and 17 (TTF).

**Location**

The location is indicated by the ICAO location indicator, the place name, or the approved abbreviation.

**Origination time**

The origination date/time of TAF and METAR/SPECI is given in UTC using a six figure group followed by the code Z (for UTC).
Validity period

The validity period of a TAF is given in UTC in the format ddhh/ddhh, where ddhh is the day of month and hour, for example: 0100/0206 is a validity period from 00 UTC on the 1st until 0600 UTC on the 2nd.

Auto

This group will be included when the METAR/SPECI contains only automated observations, which may include visibility, present weather, and cloud.

When the Automatic Weather Station (AWS) includes sensors for horizontal visibility, present weather and cloud, the AUTO report will include the parameters from these sensors in the body of the message (where previously only manually observed visibility, present weather and cloud data were included).

Note—Pilots should exercise caution when interpreting automated visibility, present weather and cloud information as data from these instruments may not be equivalent to human observations.

Wind AIP GEN 3.5

Wind direction is rounded to the nearest 10 degrees and is given in three figures relating to true north. Wind speeds are given in two figures. When the wind is calm, the group is encoded as 00000KT.

A variable wind direction is given as VRB and is used when the reporting or forecasting of a mean wind direction is not possible, such as in the following conditions:

- light winds (3 kt or less) or
- when forecasting a single direction is not possible, for example: with a tropical cyclone, or with the passage of a thunderstorm, in which case the forecast wind might be VRB60KT.

Maximum wind speed is given only when it is 10 kt or more greater than the mean wind speed. It is indicated by the letter G which is followed by the maximum wind speed, for example: 280°, mean speed 20 kt, maximum speed 35 kt, is given as 28020G35KT.

At some aerodromes, an additional wind group will be given in METAR/SPECI when the direction varies by 60° or more during the sampling period (normally ten minutes). The group gives the extreme range of directions in clockwise order, for example: 360V090.
Visibility

In TAF, the prevailing visibility (the greatest visibility covering more than half the aerodrome) is always given.

In METAR/SPECI, if the visibility is not the same in different directions and:

- the minimum visibility is the prevailing visibility or
- the visibility is fluctuating rapidly, then

the minimum visibility is the only information provided. When the minimum visibility is not the prevailing visibility and the minimum visibility is less than 5000m, both the prevailing visibility and the minimum visibility will be given. In this case the prevailing visibility is reported first followed by the minimum visibility including an indicator to show the general direction of the minimum visibility in relation to the observing point (the meteorological station), e.g. the visibility groups 9000 0600N indicate a prevailing visibility of 9000m and a minimum visibility of 600m to the north.

A visibility of 10 km or more is given by 9999.

Automatic visibility information

A report from an AWS with a visibility sensor will include data from this sensor in the body of the report if the report is fully automated (in which case the abbreviation AUTO is also included in the message).

Note—Pilots should exercise caution when interpreting automated visibility information as it may not be equivalent to a human observation because:

- the information is reported as a ten-minute average and
- as it is sourced from a single instrument sampling only a very small parcel of the atmosphere, it may not be representative of the entire airport.

Fully automated AWS may issue special reports (SPECI) for visibility using data from visibility sensors.
Runway visual range (RVR)

RVR may be reported in SPECI messages from aerodromes with RVR instrumentation. RVR at the runway’s touchdown zone may be reported in SPECI messages from aerodromes with RVR instrumentation. It will be reported in the format RDD/VVVVi or RDD/VVVVVVVVVi where:

- **R** and **V** are fixed indicators
- **DD** gives the runway number, for example 36
- **VVVV** gives the RVR value and
- **i** gives the tendency (either U, D or N for up, down or nil).

When RDD/VVVVi is reported, VVV is the average—normally over 10 minutes.

RDD/VVVVVVVVV is reported when the RVR has varied significantly during the averaging period. The group gives the one-minute mean minimum RVR value followed by V followed by the one-minute mean maximum RVR value during the averaging period, for example: R16/0500V1100.

Present weather

Present weather is given using the codes listed on page 2.36.

Appropriate intensity indicators and letter abbreviations will be combined in groups of two to nine characters to indicate present weather at, or in the vicinity of, the aerodrome. If more than one form of precipitation is observed, the appropriate letter abbreviations shall be combined in a single group with the first being the dominant type of precipitation. In such a group, the intensity shall refer to the total precipitation. Up to three groups may be given.

The intensity of precipitation, blowing dust, sand or snow, dust storm and sand storm will be indicated by the prefix – for light, + for heavy, and no prefix for moderate.

The qualifier VC will be used to report certain significant weather phenomena in the vicinity of the aerodrome (Note: vicinity, for meteorological purposes refers to the area between approximately 8–16 km of an aerodrome reference point).

Automatic present weather information

A report from an AWS with a present weather sensor will include data from this sensor in the body of the report if the report is fully automated, in which case the abbreviation AUTO is also included in the message (AIP GEN 3.5).

**Note**—Pilots should exercise caution when interpreting automated present weather information, as it may not be equivalent to a human observation.
Cloud

Cloud height is reported in hundreds of feet using three figures, for example: 700 ft is reported as 007.

Cloud amount is given using the following abbreviations listed on page 2.36.

In a weather report, nil cloud is reported as SKC (sky clear). In a weather forecast, cloud information is not included if the sky is clear.

Cloud information is given from the lowest to the highest layer or mass in accordance with the following criteria:

- the lowest layer or mass, regardless of amount
- the next layer or mass, covering more than 2 OKTAS
- the next higher layer or mass, covering more than 4 OKTAS and
- cumulonimbus and/or towering cumulus clouds whenever observed or forecast and not reported in one of the groups above.

Type of cloud is identified only for cumulonimbus and towering cumulus observed at or near the aerodrome. These will be given as CB and TCU respectively. When an individual layer or mass of cloud is composed of cumulonimbus and towering cumulus with a common cloud base, the type of cloud is reported as cumulonimbus only, and the amount shall be reported as the sum of the CB and TCU amounts.

Whenever cumulonimbus cloud is forecast, the degree of associated thunderstorm activity or probability of occurrence is included.

A clear sky will be indicated in a report by SKC. When the sky is obscured, the cloud group is omitted and vertical visibility may be given in the format VVhhh, where hhh is the vertical visibility in hundreds of feet. When information on vertical visibility is not available, hhh may be given as ///, indicating that the sky is obscured but information on the vertical visibility is not available.
CAVOK

CAVOK is included in reports (from staffed stations only) or forecasts when the following conditions are observed, or forecast to occur, simultaneously:

- visibility of 10 km or more
- nil significant cloud, that is, no cloud below 5000 ft or below the highest 25 nm minimum sector altitude, whichever is greater, and no cumulonimbus or towering cumulus at any height and
- nil significant weather, that is, none of the weather phenomena such as BR-Mist; DU-Dust etc. to VA-Volcanic ash, listed in the preceding section: Weather code and translation.

When the term CAVOK is given, the elements visibility, weather and cloud will not be given.

In METAR/SPECI, whenever a total of BKN or more of low or middle cloud cover is at or above 5000 ft, and CAVOK has been used, the cloud amount and base may be given as a remark after the RMK indicator.

Automatic weather stations with cloud information

A report from an AWS with a cloud sensor will include data from this sensor in the body of the report if the report is fully automated (in which case the abbreviation AUTO is also included in the message). The data will be in the same form as manual reports except that:

- NCD will be reported if no cloud is detected and
- there will be no indication of cumulonimbus or towering cumulus.

Note—Pilots should exercise caution when interpreting automated cloud information as it may not be equivalent to a human observation because:

- the information is reported as a 30-minute average with double weighting given to the last 10 minutes and
- as it is sourced from a single ceilometer sampling only the sky directly overhead, it may not be representative of the entire skyline.

AWS may issue special reports (SPECI) for cloud using data from cloud sensors.
**Significant variation**

Aerodrome forecasts will include significant changes or variations (indicated by FM, BECMG, INTER and TEMPO) to the previously given conditions when the relevant criteria are met. These relate to improvements as well as deteriorations.

The variation groups TEMPO and INTER are used to indicate significant variations of a temporary or intermittent nature. The change groups FM and BECMG are used to specify changes that are more lasting in nature. The indicators are the beginning of a self-contained forecast.

When thunderstorms or reduced visibility due to fog, mist, dust, smoke or sand is forecast, but the probability is assessed at between 30 per cent and 40 per cent, the terms **PROB30** or **PROB40** are used. INTER or TEMPO may also be used with a PROB for thunderstorms. If greater than, or equal to, 50 per cent probability is forecast, reference is made to the phenomenon in the forecast itself and not by the addition of a PROB statement.

The terms **NSW** (nil significant weather), and **NSC** may be included following FM or BECMG to indicate significant improvements expected.

If a TAF or TTF includes a forecast of turbulence, its commencement will be indicated by the abbreviation FM, and its cessation within the forecast coverage will be indicated by the abbreviation **TILL**. Start and finish times are given in the format ddhhmm (day of month, hour, minute). Turbulence associated with CB and TCU clouds is not included in forecast as it is implied.

**Temperature**

Aerodrome weather reports contain both air temperature and dew point. Up to four forecast values of air temperature are given, for the times HH, HH+3 hours, HH+6 hours and HH+9 hours, where HH is the time of commencement of the TAF validity period. Users should use linear interpolation to determine the forecast value between these points.

The temperature forecasts are prefixed by the letter **T**. Negative values are indicated by the letter **M** before the numeral.
QNH

QNH is given in whole hectopascals using four figures.

Observed intermediate values are rounded down, for example: 1001.9 is reported as 1001.

QNH is always given, prefixed by the letter Q, for example: Q0999.

Up to four forecast values of QNH are given, for the times HH, HH+3 hours, HH+6 hours and HH+9 hours, where HH is the time of commencement of the TAF validity period. Users should use linear interpolation to determine the forecast value between these points. The QNH forecasts are prefixed by the letter Q.

Supplementary information

In METAR/SPECI, supplementary information is used to report the following:

- recent weather (RE) of operational significance and
- wind shear (WS) information on a take-off or landing runway.

Remarks section

Rainfall

The remarks section of the report will include rainfall recorded by an automatic rain gauge. The information is in the form RF##.### where the first three digits after the indicator RF will report the rainfall recorded in the 10 minutes prior to the observation time, and the next four digits report the total rainfall recorded since 0900 local time. Both amounts are expressed in millimetres to the nearest 0.2 mm.

Plain language

Any other significant weather conditions (for example an approaching front or visible bushfires) are appended in plain language.

Elements not available

A report from a fully automated AWS that does not include information from sensors for visibility, weather, or cloud will report ///, // or //// respectively in lieu of these parameters.
Terminal Area Forecast (TAF) examples

TAF YCOM 070635Z 0708/0720 18015KT 9999 FEW005 BKN020
TEMPO 0710/0714 2000 -SHSN BKN005 SCT020
RMKT 03 00 M02 M04 Q 1008 1007 1006 1006

TAF YSSY 020435Z 0206/0312 31005KT CAVOK
FM021400 16015KT 8000 SHRA BKN008 SCT030
FM022300 23010KT 9999 NSW SCT030
RMKT 25 21 18 15 Q 1012 1013 1014 1014

TAF YSCB 270448Z 2706/2806 33015G28KT 3000 +RABKN010 OVC100
FM271400 16015KT 8000 SHRA FEW010 SCT040 SCT100
INTER 2710/2714 1000 +TSRA BKN005 SCT040CB
RMKT FM270800 MOD TURB BLW 5000 ft TILL271300
T 14 13 13 11 Q 1016 1015 1013 1016

Aerodrome weather report examples

SPECI YMML 092000Z 22012KT 170V260 6000 SHRA SCT035TCU 31/20 Q1020
RETS RMKT RF02.0/004.0

SPECI YBCS 221745Z 23014G29KT 6000 1200NETSRA FEW040CB BKN100 26/22
Q1003 RMKT RF04.0/004.0

SPECI YSSY 271915Z VRB01KT 3000 VCFG FEW030 18/17 Q1018 RMKT RF00.0/000.0

METAR YMOR 100400Z 06013KT 9000 VV/// 31/08 Q1010 RMKT RF00.0/000.0 SKY
OBS DUE BUSH FIRE SMOKE

SPECI YSCB 141400Z AUTO 20008KT 9000 // BKN016 14/11 Q1001 RMK
RF00.0/000.0

SPECI YMAV 240215Z AUTO 36018G28KT 9999 // NCD 31/10 Q1014 RMK
RF00.0/000.0

METAR YSBK 241700Z AUTO 15002KT 0900 // ///// 04/04 Q1020 RMK RF00.0/000.0
CLD: SKY MAY BE OBSC
Trend Type Forecasts

Trend Type Forecast (TTF)

At major aerodromes, a statement of trend, valid for three hours from the time of the observation, is appended to the observation (AIP GEN 3.5). TTF service is provided for the following locations:

- Adelaide
- Amberley
- Brisbane
- Darwin
- Cairns
- Canberra
- East Sale
- Melbourne
- Nowra
- Oakey
- Pearce
- Perth
- Sydney
- Tindal
- Townsville
- Williamtown
The TTF relates to weather conditions expected to affect the aerodrome of origin for the validity period of the forecast. This period is three hours unless, if the TTF service is not 24 hours, the TTF commencement falls within the last three hours of the service cessation. If the TTF validity is reduced to less than three hours, this will be indicated in the remarks section (AIP GEN 3.5), for example: **Use TAF for arrival after 0800Z.**

The decode of the TTF is as per that for the METAR/SPECI, except there is a statement of trend appended to the forecast. This may contain the following (AIP GEN 3.5):

- **NOSIG** is used to indicate that no significant changes to the wind, visibility, weather and cloud, as reported in the METAR/SPECI, are expected to occur during the validity period of the TTF.

- **FM** (time) indicates that significant changes to a new set of mean conditions, from those previously given, are expected to occur at the specified time and to persist until the end of the validity period of the TTF, or until new mean conditions are given.

- **INTER** (periods less than 30 minutes) and **TEMPO** (periods of between 30 minutes and 60 minutes) are given as INTER and TEMPO (time2/time3) – in this case, intermittent or temporary variations are expected to commence at (time2) and to end at (time3).

- Turbulence associated with CB and TCU clouds is not included in the forecast as it is implied. **TILL** (time) is used if the turbulence is expected to cease before the end validity period of the TREND.

The TTF supersedes the TAF for its validity period and is the current forecast for pilots of aircraft whose arrival time falls within the validity period. Note that PROB is not used in TTF, but it is included in a TAF. For aerodromes where the TTF is not a 24-hour service, the TAF will become the valid forecast from the time indicated in the remarks section of the TTF. For example:

**Use TAF for arrival after 0800Z.**

**Note**—Where applicable, TTF replaces TAF and present weather in VOLMET broadcasts.
**Trend Type Forecast (TTF) examples** AIP GEN 3.5

TTF SPECI YPAD 012200Z 00000KT 5000 DZ OVC005 14/14 Q1025 RMK RF00.4/000.4
FM2200 00000KT 9999 NSW BKN008
FM2300 03005KT 9999 NSW SCT020

TTF SPECI YMML 100200Z 05008KT 4000 DZ BKN005 OVC100 16/15 Q1017 RMK RF00.2/000.2 NOSIG

TTF METAR YPPH 120500Z 36015KT CAVOK 32/08 Q1014 RMK RF00.0/000.0
FM0630 28025KT 9999 NSW BKN030
INTER 0530/0730 5000 SHRA BKN008

TTF METAR YBTL 220730Z 35006KT 9999 FEW050TCU 31/21 Q1005 RMK RF00.0/000.0 DISTANT THUNDER NOSIG

TTF SPECI YBTL 240800Z 03010KT 4000 TSRA BKN030CB SCT120 27/24 Q1008 RMK RF00.0/000.0
FM0830 03005KT 9999 SHRA BKN035
INTER 0830/1100 4000 TSRA SCT010 SCT030CB

TTF METAR YSCB 140600Z 20008KT CAVOK 14/11 Q1001 RMK RF00.0/000.0 NOSIG
USE TAF FOR ARRIVALS AFTER 0800Z
Wind shear warning service

**General**  AIP GEN 3.5

Aircraft reports of wind shear encountered during climb and descent are the primary means of detecting wind shear. When possible, the MET forecasting office provides advice on the likely duration of the event and forecast low-level winds.

When wind shear has been reported or the meteorological situation has been assessed as a risk, then a **wind shear warning** is issued.

Wind shear warnings for an event will specify a validity period and sequence numbers will be assigned to each warning associated with an event. A wind shear warning will be cancelled when wind shear is no longer expected.

This service is provided at Sydney, Melbourne, Brisbane, Perth, Adelaide, Darwin, Cairns, Hobart and some defence locations.

When windshear is forecast, or reported by pilots at an intensity greater than ‘light’, this information, together with a forecast low-level wind, will be included on the ATIS at any of the above aerodromes.

**Meteorological reports**

Aerodrome weather reports are observations of meteorological conditions at an aerodrome. The reports are generated by electronic recording devices called automated weather stations (AWS) and may also have manual input by approved observers.

**Routine reports (METAR)** are issued at fixed times, hourly or half-hourly, and are made available at pre-flight briefing or on request to aircraft in flight.

**Special reports (SPECI)** are aerodrome weather reports issued whenever weather conditions fluctuate about, or are below, specified criteria.

**Take-off and landing reports** are provided at aerodromes with a control tower. This service may also be provided by a CA/GRS or UNICOM, details of which can be obtained in **ERSA**.

Take-off and landing reports are included on ATIS, where available, or passed to aircraft reporting taxiing or inbound. Take-off and landing reports contain, as available, the following:

- wind velocity, with direction in degrees magnetic
- altimeter setting
- air temperature (if appropriate to the type of aircraft)
• low cloud, if significant
• visibility, if significant – in metres up to and including 5000 m; above this value, in km (a visibility greater than 10 km is given as ‘visibility greater than 10 km’)
• additional items, that is extent of cloud below the main ceiling, disposition and intensity of rain, reported turbulence area, presence of freezing fog etc and
• CAVOK – when the following conditions are observed to occur simultaneously
  – visibility of 10 km or more
  – nil significant cloud that is no cloud below 5000 ft, or below the highest 25 nm minimum sector altitude, whichever is the greater, and no CB or TBU at any height
  – nil significant weather, that is none of the weather phenomena listed on page 2.36.

Note—When the term CAVOK is used, low cloud, visibility and additional items will not be advised.

The meteorological information provided by air traffic controllers may be obtained by observation of the whole horizon, or only of the probable flight path of an aircraft. Reports based on AWS data will be limited to wind direction and velocity, QNH and temperature, except when a qualified observer at the aerodrome provides visually observed information.

Approved observers
Approved observers are officers of the BoM, air traffic controllers, and other persons on the ground approved for the purpose by the BoM and/or CASA.
For the purpose of observing visibility for take-off and landing at an aerodrome, the pilot in command shall be deemed an approved observer for that flight.

Observing point
The location of the observing point for the aerodrome weather reports is such that the meteorological conditions observed within visual range, or interpreted from instruments at that point, are representative of conditions at the aerodrome.

Aircraft weather reports
The pilot in command of an aircraft is required to observe and report en-route meteorological conditions as prescribed in AIP GEN 3.5 (regarding AIREP). For this purpose, they are deemed an approved observer.
In addition to requirements for special AIREP reports concerning MET conditions likely to affect the safety of other aircraft, pilots in areas where ground meteorological reports are scanty are encouraged to report observations of MET conditions which they consider will assist in the provision of meteorological services.
Meteorological advice

**SIGMET AIP GEN 3.5**

SIGMET information concerns the occurrence or expected occurrence, in an area over which meteorological watch is being maintained, of one or more of the following:

<table>
<thead>
<tr>
<th>Meteorological Phenomenon</th>
<th>SIGMET Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obscured thunderstorms</td>
<td>OBSC TS</td>
</tr>
<tr>
<td>Embedded thunderstorms</td>
<td>EMBD TS</td>
</tr>
<tr>
<td>Frequent thunderstorms</td>
<td>FRQ TS</td>
</tr>
<tr>
<td>Squall line thunderstorms</td>
<td>SQL TS</td>
</tr>
<tr>
<td>Obscured thunderstorms with hail</td>
<td>OBSC GR</td>
</tr>
<tr>
<td>Embedded thunderstorms with hail</td>
<td>EMBD TSGR</td>
</tr>
<tr>
<td>Frequent thunderstorms with hail</td>
<td>FRQ TSGR</td>
</tr>
<tr>
<td>Squall line thunderstorms with hail</td>
<td>SQL TSGR</td>
</tr>
<tr>
<td>Tropical cyclones</td>
<td>TC</td>
</tr>
<tr>
<td>Severe turbulence</td>
<td>SEV TURB</td>
</tr>
<tr>
<td>Severe icing</td>
<td>SEV ICE</td>
</tr>
<tr>
<td>Severe icing due to freezing rain</td>
<td>SEV ICE (FZRA)</td>
</tr>
<tr>
<td>Severe mountain waves</td>
<td>SEV MTW</td>
</tr>
<tr>
<td>Heavy dust storm</td>
<td>HVY DS</td>
</tr>
<tr>
<td>Heavy sand storm</td>
<td>HVY SS</td>
</tr>
<tr>
<td>Volcanic ash cloud</td>
<td>VA</td>
</tr>
<tr>
<td>Radioactive cloud</td>
<td>RDOACT CLD</td>
</tr>
</tbody>
</table>

SIGMETs for TS are only issued when the TS are:

- OBSC by haze or smoke and cannot be readily seen
- EMBD within cloud layers and cannot be readily recognised
- FRQ with little or no separation between adjacent clouds and covering more than 75 per cent of the area affected or
- SQL TS, that is, TS along a line of about 100 nm or more in length with little or no separation between clouds.

SIGMETs for TS do not refer to CB, ICE or TURB as their presence is implied.
SIGMETs for TC include reference to the height of CB tops but not to TS, ICE or TURB as their presence is implied.

SIGMETs for MTW are issued when accompanying downdrafts of 600 ft/min or more are estimated.

SIGMET for TURB refers to low-level turbulence associated with strong surface winds, to rotor streaming, or to turbulence near jet streams.

Pilots in command of aircraft encountering any of the above phenomena, not notified by SIGMET advices, must report details of the phenomenon in an AIREP SPECIAL (AIP GEN 3.5).

SIGMETs are issued by MET forecasters and disseminated by ATS as an element of ATC-initiated FIS to aircraft operating on routes or in areas likely to be affected. This information will normally relate to phenomena reported to designated reporting points, and where possible will indicate the area in which the phenomenon exists.

**AIRMET**

AIRMET information concerns the occurrence, or expected occurrence, in an area over which meteorological watch is being maintained, of one or more of the following phenomena when the phenomena have not been included in a current GAF:

- isolated and occasional thunderstorms
- moderate icing
- moderate turbulence, when this is expected to occur in an area, or at a time, where or when it is not a normal seasonal feature
- extensive areas of visibility of less than 8 km
- extensive areas of cloud coverage of BKN or OVC below 1500 ft above ground level and
- when the wind at lowest-level forecast (for example 2000 ft) is expected to increase by at least 20 kt to at least 40 kt.

AIRMET information, which concerns phenomena of a lesser degree of severity than SIGMET information, is given to aircraft operating at or below 10,000ft.

AIRMET information is issued by MET forecasters and disseminated by ATS as an element of ATC-initiated FIS, to aircraft operating on routes or in areas likely to be affected. It will indicate the locality or area in which the phenomena exist or are expected to exist.
Pilots in command who encounter any of the above phenomena, which have not been notified by a forecast or an AIRMET advice, should report the details by SHORT AIREP.

Note—AIRMET information is additional to SIGMET information which is issued to all aircraft types.

Hazardous weather

Responsibility AIP GEN 3.5

Cooperative and concerted action is required by pilots, meteorologists and ATS to ensure the most accurate information is promulgated to assist pilots in the avoidance of hazardous weather, particularly volcanic ash clouds and phenomena associated with thunderstorms—icing, hail and turbulence.

Meteorologists are responsible for the observation of weather phenomena and forecasting their occurrence, development and movement, in terms applicable to aircraft operations. These forecasts need to be produced in sufficient time for evasive action to be taken.

ATS is responsible for distributing reports of hazardous meteorological conditions to pilots as a part of the Flight Information Service. ATS also makes visual and limited radar weather observations for the information of meteorologists and pilots, and is responsible for relaying pilot weather reports to the BoM. At some locations, ATS is provided with METRAD or RAPIC which may supplement weather advice by the ATS. Details are given in AIP GEN 3.3.

When manoeuvring in hazardous weather, pilots are responsible for the safety of their own aircraft using advice and clearances passed by ATS and information obtained from their own visual or airborne radar observations.

They are also responsible for passing visual and airborne radar observations of hazardous weather to ATS. Refer AIP ENR 1.1, Appendix 1.

Pilot action

Outside controlled airspace all hazardous weather avoidance action is the sole responsibility of the pilot in command. However, in order to preserve the safety of the aircraft and other air traffic, the pilot in command is requested to advise ATS of intended actions.

The pilot in command, both inside and outside controlled airspace, must advise ATS promptly of any hazardous weather encountered, or observed visually or by radar. Those observations should include as much detail as possible, including location and severity. Hazardous weather includes, in particular, thunderstorms, severe turbulence, hail, icing and line squalls, and volcanic ash cloud.
Wind shear—pilot reporting

Wind shear encountered by aircraft must be reported by pilots to ATS as aircraft following may not have the performance required to recover from the same wind shear encounter. The wind shear may also be increasing in intensity, making flight through the wind shear more dangerous for following traffic.

Due to cockpit workload, reports may be initially reported as wind shear escape and a full report provided when workload allows.

The full report must include:

- an assessment of the intensity:
  - light—shear causing minor excursions from flight path and/or airspeed
  - moderate—shear causing significant effect on control of the aircraft
  - strong—shear causing difficulty in keeping the aircraft to desired flight path and/or airspeed or
  - severe—shear causing hazardous effects to aircraft controllability
- a factual plain language report regarding airspeed/ground speed changes (gain or loss) or undershoot/overshoot effects
- the altitude or altitude band at which the adverse effect was experienced and
- where practicable, other relevant information such as significant changes in wind direction and/or speed may be included.

At non-controlled aerodromes, the report should also be broadcast to all aircraft on the CTAF and should include the name of the aerodrome.

The responsibility to continue an approach to land, or take off, following notification of low-level wind shear rests with the pilot in command.

Automatic meteorological broadcasts

Routine broadcasts of selected operational meteorological information for use by aircraft in flight are made from suitable locations using discrete ground-to-air frequencies.

Automatic en route information services (AERIS)

The AERIS continuously broadcasts METAR from a network of VHF transmitters installed around Australia. Details of transmitter sites, frequencies and locations for which METAR are provided are at ERSAGEN – FIS – INFLIGHT.
### VHF automatic en route information service (AERIS) network (coverage at 20,000 ft)

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AIREP

**AIREP Special** AIP GEN 3.5

A pilot in command should make a special AIREP report when requested, or as soon as practicable after encountering any SIGMET phenomena (see page 2.36) which has not been notified, or any other MET condition which is likely to affect the safety or markedly affect the efficiency of other aircraft.

The estimate of next position may be omitted from an AIREP Special report except where the report is made at a planned position reporting point.

In the climb-out and approach phases, a pilot in command must report meteorological conditions, not previously advised, which are likely to affect the safety of aircraft operations.

**Short AIREP**

Short AIREP should be provided by pilots when requested. ATS should be advised when a pilot encounters:

- cloud—unexpected significant variations to amount, base or tops (by reference to QNH)
- visibility—reduced due to fog, mist, hail, rain, snow or dust, or improvement observed
- wind—significant variation to forecasts and/or
- other phenomena—incidence of severe or moderate turbulence, thunderstorms, moderate or severe icing, hail, line squalls, standing waves or winds of 40 kt or more within 2000 ft of ground level.

The report comprises:

- callsign of the ground station
- callsign of the aircraft
- short AIREP
- either
  - position and time, or
  - ‘en route (departure point) to (destination)’
- a weather report.
Flights over water

Pre-flight

Flights over water CAR 258, AIP ENR 1.1

An aircraft shall not fly over water at a distance from land greater than the distance from which the aircraft could reach land if the engine, or, in the case of a multi-engined aircraft, the critical engine, were inoperative. However, it is a defence to a prosecution if the flight was:

- in accordance with directions issued by CASA or
- in the course of departing from or landing at an aerodrome in accordance with a normal navigational procedure for departing from or landing at that aerodrome.

Note the ‘critical engine’ of a multi-engined aircraft is the engine the non-operation of which (when the other engines are in operation) gives the highest minimum speed at which the aircraft can be controlled.

Aircraft engaged in private, airwork or charter operations, and which are normally prohibited by CAR 258 from over-water flights because of their inability to reach land in the event of engine failure, may fly over water subject to compliance with the following conditions. These conditions are additional to the requirements for flight over land (AIP ENR 1.1).

The requirements for flights over water are as follows:

- for charter operations carrying passengers the distance from land suitable for emergency landing must not exceed 25 nm
- helicopters may use a fixed platform or a vessel suitable for an emergency landing
- seaplanes may use an area of water suitable for an emergency landing and located adjacent to land
- there is no limitation for private, airwork or freight-only charter operations
- each occupant of the aircraft must wear a life jacket during the flight over water unless exempted from doing so under the terms of CAO 20.11 para 5.1.7 to 5.1.9 and
- a meteorological forecast must be obtained.

Note—Requirements regarding pre-flight passenger briefing are provided in page 2.72.
**SAR alerting** AIP ENR 1.1

- VFR flights may choose to operate on reporting schedules for the over-water stages of a flight. Schedules may be arranged before commencing the over-water stage and terminate on completion of the crossing.

- VFR aircraft not equipped with radio which will enable continuous communication, or not radio-equipped, must carry a survival beacon as prescribed in CAO 20.11 para 6 for the over-water stages of the flight.

**Note**—VFR flights in the categories outlined in AIP ENR 1.10 are required to submit a SARTIME flight notification to ATS, or, as an alternative, to leave a flight note with a responsible person. This requirement includes flights over water.

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**Safety equipment**

**Life jackets** CAO 20.11

**When to carry**

Aircraft shall be equipped with one life jacket that complies with the standards specified in CAO 20.11 para 5.1 for each occupant when the aircraft is over water and at a distance from land:

- in the case of a single-engine aircraft—greater than that which would allow the aircraft to reach land with the engine inoperative; and

- in the case of multi-engine aircraft—greater than 50 nm.

**Note**

1. For the purposes of this paragraph ‘land’ shall mean land suitable for an emergency landing.

2. Except as specified for regular public transport or charter, the provisions of this paragraph need not apply to land aircraft departing from or landing at an aerodrome in accordance with a normal navigational procedure for departing from or landing at that aerodrome.
Stowage requirements

Where required by CAO 20.11 para 5.1, a life jacket or individual flotation device shall be stowed at, or immediately adjacent to, each seat. In addition, sufficient additional life jackets or individual flotation devices shall be carried in easily accessible positions for use by infants or children for whom a life jacket or individual flotation device is not available at, or adjacent to, their seated position.

Life jackets shall be so stowed in the aircraft that one life jacket is readily accessible to each occupant and, in the case of passengers, within easy reach of their seats.

When to wear

Where life jackets are required to be carried in single-engine aircraft each occupant shall wear a life jacket during flight over water. However, occupants of aeroplanes need not wear life jackets during flight above 2000 ft above the water.

Where life jackets are required to be carried in accordance with CAO 20.11 para 5.1.4, each occupant of a single-engine aircraft shall wear a life jacket during flight over water when the aircraft is operated beyond gliding distance from land or water (as appropriate), suitable for an emergency landing. However, occupants need not wear life jackets when the aircraft is taking off or landing at an aerodrome in accordance with a normal navigational procedure for departing from or arriving at that aerodrome.

Life rafts

When to carry

Life rafts shall be in addition to the life jackets required for the flight.

An aircraft that is flown over water at a distance from land greater than the permitted distance* must carry, as part of its emergency and lifesaving equipment, sufficient life rafts to provide a place in a life raft for each person on board the aircraft (CAO 20.11 para 5.2).

*The permitted distance is a distance equal to 30 minutes at normal cruising speed, or 100 nm, whichever is the least (CAO 20.11 para 5.2.1.1 (b)).
Stowage requirements
Life rafts carried in accordance with this section shall be stowed so as to be readily accessible in the event of a ditching. When life rafts are stowed in compartments or containers, such compartments or containers shall be appropriately and conspicuously marked. Life rafts shall comply with a standard approved by CASA.

Signalling equipment
When to carry
Aircraft or flights where the carriage of life rafts is required by CAO 20.11 para 5.2, or on such other overwater flights as CASA specifies, shall carry approved types of the following signalling equipment:
• one ELT when one life raft is carried or
• at least two ELTs when more than one raft is carried and
• a supply of pyrotechnic distress signals.

Single-engine aircraft on flights over water, which are not equipped with radio communication equipment or are not capable of continuous air-ground communication and which are not required to carry a life raft, shall be required to carry an ELT.

Stowage requirements
The ELTs shall meet the standards specified by CASA and shall be stowed so as to facilitate their ready use in an emergency;

Survival equipment
When to carry
An aircraft shall carry survival equipment for sustaining life appropriate to the area being overflown on the following flights (CAO 20.11 para 7):
• where the carriage of life rafts is required
• during operations within or through the remote areas specified by the remote area maps and
• on such other flights as may be directed by CASA.
Designated remote areas

Maps

Designated remote areas

Aircraft planned to operate within or through designated remote areas must carry survival equipment in the area over which the flight is planned (CAO 20.11 para 7 (b)). See CAO 20.11 Appendix III for maps of designated remote areas.

Notes

1. Flight through corridors shall be made within sight of the highway concerned and never more than five nm away.
2. Australian-administered islands adjacent to the remote area between Talgarno and Cairns are part of the designated remote area.
3. The mainland within 50 nm of Darwin is excluded from the designated remote area.
Pre-flight planning – Designated remote areas – Maps

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**的设计区域

- Benalla
- Jamieson
- Albury
- Khancoban
- Berridale
- Delegate
- Mt Franklin
- Tharwa
- Canberra
- Melbourne
- Mt Franklin
- Mt Baw Baw

15 nm

**的设计区域

- West Point
- Devonport
- Black Bluff
- Launceston
- Hobart
- Cape Bruny

15 nm
Safety precautions

Passengers

Briefing of passengers CAO 20.11 (14)

The operator of an aircraft shall ensure that all passengers are verbally briefed before each take-off on:

• smoking, including the prohibition of smoking in toilets
• the use and adjustment of seat belts
• the location of emergency exits
• the use of oxygen where applicable
• the use of flotation devices where applicable
• stowage of hand luggage and
• the presence on board of special survival equipment where applicable.

See CAAP 253-2(0) for a comprehensive guide to passenger safety briefings.

Example

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

‘The law requires that you refrain from smoking on the tarmac and in the terminal as well as during take-off, landing, and refuelling.

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

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

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

Passenger briefings such as this can instil confidence in your passengers and start the flight off well.
**Passengers with special needs**

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

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**Pre-flight**

**Removal of locking and safety devices** CAO 20.2

Where external control surface locks, undercarriage pins and locks, or other external locking or restricting devices have been fitted, they shall, except where otherwise approved by CASA, be removed before taxiing for the purpose of taking off. They shall be removed only by the pilot in command or the co-pilot, or by a person instructed in this function and authorised to perform it by the owner, hirer, operator or pilot in command.

Where external control surface locks, undercarriage pins and locks, or other external locking or restricting devices are removed by a person other than the pilot in command or co-pilot:

- removal shall only be effected as directed by the pilot in command;
- the locks, pins and other external devices shall be shown to the pilot in command from a position which will enable him to readily determine that all pins, locks and devices are being displayed;
- during the hours of darkness the owner, hirer, operator or pilot in command shall ensure that adequate lighting is provided to enable the pilot in command to see the articles displayed; and
- when the pilot in command is satisfied that all locking devices have been removed and displayed they shall give an agreed form of acknowledgement to the person effecting removal.
When an aircraft has been parked, taxied or towed in winds exceeding 35 kt and the control systems and surfaces have not been effectively restrained either by a person in the cockpit or by approved control surface gust locks, the pilot in command or an appropriately licensed maintenance engineer shall, before flight, inspect the control systems and control surface attachments for damage. Where external control surface locks or restricting devices have been removed, or where an aircraft is to be flown for the first time following maintenance work involving the aircraft’s control surfaces or control surface systems, the pilot in command shall, immediately before taxiing for the purpose of taking off, test the flight controls to the full limit of their travel and carry out any other tests as are necessary to ensure that those controls are functioning correctly (CAR 244(1)(a)).

**Security of doors and hatches** CAO 20.2

Immediately before taxiing for the purpose of taking off on any flight, the pilot in command shall ensure that all doors, escape hatches and loading hatches are properly secured.

**Precautions before solo flight in aircraft fitted with dual controls** CAO 20.2

The pilot in command of an aircraft fitted with dual controls, which is to be flown solo, shall ensure that the safety harness and any other articles or equipment which may foul the controls are safely secured. If the second control column is easily detachable, it must be removed.

**Fuel system inspection** CAO 20.2

The operator and pilot in command shall ensure that the following inspections and tests for the presence of water in the fuel system of the aircraft are made:

- either:
  - if any of the following apply, an inspection and test in accordance with the approved data
  - the aircraft manufacturer’s data specifies the manner in which inspections and tests for the presence of water in the aircraft’s fuel system are to be made, and
• the data has been approved under CAR 42M as part of the aircraft’s system of maintenance or
– in any other case, before the start of each day’s flying, and after each refuelling, with the aircraft standing on a reasonably level surface, drain a small quantity of fuel from each fuel tank into a clear transparent container and check by an approved method for the presence of water and
• on such aircraft types which may be specified by CASA, extend the inspection to fuel system filters and collector boxes. It is recommended that all aircraft fuel system filters and collector boxes be checked for water contamination at frequent intervals.

**Note**—It is important that checks for water contamination of fuel drainage samples be positive in nature and do not rely solely on sensory perceptions of colour and smell, both of which can be highly deceptive. The following methods are acceptable:
• Place a small quantity of fuel into the container before taking samples from tank or filter drain points. The presence of water will then be revealed by a visible surface of demarcation between the two fluids in the container
• Check the drainage samples by chemical means such as water detecting paper or paste, where a change in colour of the detecting medium will give clear indication of the presence of water or
• In the case of turbine fuel samples, tests should also include inspection for persistent cloudiness or other evidence of the presence of suspended water droplets, which will not necessarily be detected by the methods mentioned above. Should any doubt exist about the suitability of the fuel, the checks specified in the aircraft operator’s maintenance manual should be followed. It is advisable to allow turbine fuel a reasonable period of stagnation before drawing test samples from fuel drain points. This allows settling of suspended water which is a slower process in turbine fuel than in aviation gasoline.

The paragraph above does not apply to helicopters that are being hot refuelled in accordance with CAO 20.10.

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

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

The operator and pilot in command shall ensure that, before each day’s flying, they inspect all external fuel tank vents to be free from obstruction.
Daily inspections

An inspection (called a daily inspection) must be carried out on the aircraft before the aircraft’s first flight on each day on which it is flown (CAR Schedule 5).

A daily inspection must consist of the making of such checks set out in the aircraft flight manual (AFM), approved system of maintenance or the following list (as applicable to the aircraft):

**Table of checks included in a daily inspection**

| Check that ignition switches are off, the mixture control is lean or cut off, the throttle is closed and the fuel selector is on. |
| Check that propeller blades are free from cracks, bends and detrimental nicks, that the propeller spinner is secure and free from cracks, that there is no evidence of oil or grease leakage from the propeller hub or actuating cylinder and that the propeller hub, where visible, has no evidence of any defect which would prevent safe operation. |
| Check that the induction system and all cooling air inlets are free from obstruction. |
| Check that the engine, where visible, has no fuel or oil leaks and that the exhaust system is secure and free from cracks. |
| Check that oil quantity is within the limits specified by the manufacturer for safe operation and that the oil filler cap, dipstick and inspection panels are secure. |
| Check that the engine cowlings and cowl flaps are secure. |
| Check that the landing gear tyres are free from cuts or other damage, have no plies exposed and, by visual inspection, are adequately inflated. |
| Check that the landing gear oleo extensions are within normal static limits and that the landing gear doors are secure. |
| Check that the wing and fuselage surfaces are free from damage and that the inspection panels, flight control surfaces and flight control devices are secure. |
| Check that the interplane and centre section struts are free from damage and that the bracing wires are of the correct tension. |
| Check that the pitot heads and static ports are free from obstruction and that the pitot cover is removed or is free to operate. |
| Check that fuel tank filler caps, chains, vents and associated access panels are secure and free from damage. |
| Check that empennage surfaces are free from damage and that the control surfaces, control cables and control rods, where visible, are secure. |
Check that canard surfaces are free from damage and that the control surfaces, control cables and control rods, where visible, are secure.

Check that flight controls, the trim systems and the high-lift devices operable from the ground have full and free movement in the correct sense.

Check that radios and antennae are secure and that where visible, radio units and interwiring are secure.

Check that drain holes are free from obstruction.

Check that there is no snow, frost or ice on the wings, tail surfaces, canards, propeller or windscreen.

Check that each tank sump and fuel filter is free from water and foreign matter by draining a suitable quantity of fuel into a clean transparent container.

Check that the windscreen is clean and free from damage.

Check that the instruments are free from damage, legible and secure.

Check that the seat belts, buckles and inertia reels are free from damage, secure and functioning correctly.

**Additional items for agricultural aeroplanes**

Check that the agricultural equipment is secure.

Check that the dump and fan brake mechanisms are free from obstructions and operate correctly.

**Additional items for seaplanes**

Check that the hull and floats are free from damage, corrosion and water accumulation.

Check that the float attachment struts, bracing wires and attachment fittings are secure and free from damage and corrosion.

Check that the water rudder and its attachments are secure and free from damage and corrosion and that the water rudder has full, free and correct travel.
Emergency Locator Transmitter (ELT) requirements  CAR 252A

An ELT must transmit, when activated, in the frequency band 406MHz – 406.1MHz, and on 121.5MHz. An ELT must also be registered with the Australian Maritime Safety Authority. See CAR 252A para (4) to (6) for further ELT requirements.

Australian Maritime Safety Authority (freecall) 1800 406 406

When undertaking a flight more than 50 nm radius from the aerodrome of departure, you must carry a serviceable ELT. If the ELT is installed on the aircraft it must be armed before flight. If it is a portable ELT it must be carried in a readily accessible place.

Exceptions to this requirement are:
- flights wholly within 50 nm of the aerodrome of departure
- aerial agriculture flights
- where CASA has issued an approval (CASR 21.197)
- the aircraft is new and the flight is for a purpose associated with its manufacture, preparation or delivery or
- the flight is for the purpose of moving the aircraft to a place to have an approved ELT fitted to the aircraft, or to have an approved ELT that is fitted to it repaired, removed or overhauled
  - an entry has been made in the aircraft’s log book stating the ELT make, model and serial number together with the date it was removed and the reason for doing so
  - a placard stating ‘ELT not installed or carried’ has been placed in a position visible to the pilot and
  - not more that 90 days have passed since the ELT was removed.

AusSAR—Australian Rescue Coordination Centre (RCC)  AIP GEN 3.6

AusSAR is the Australian RCC.

Enquiries
Australian Rescue Coordination Centre
GPO Box 2181, Canberra City ACT 2601
T: 1800 815 257 or 1800 641 792. F: 1800 622 153
Monitoring of 121.5MHz

Pilots should monitor 121.5 MHz before engine start and after shut down. Reception of an ELT transmission must be reported to ATS or the RCC immediately (AIP GEN 3.6).

Checking ELTs

There are two types of ELT beacon testing: self-testing and operational testing. Self-testing signals are not processed by satellite equipment. All 406 MHz beacons can be tested at any time using the self-test function without prior approval from the RCC. The operational-testing mode requires prior approval from RCC Australia as it impacts on the Cospas-Sarsat system.

Test transmissions from ELTs should be limited to five seconds and it is preferred that such tests be conducted within the first five minutes of the hour. Before conducting operational tests operators must notify AusSAR, and where the beacon is operated on 406 MHz, its HexID must be provided (AIP GEN 3.6).

Go to beacons.amsa.gov.au/maintenance for detailed ELT testing procedures

Inadvertent ELT activation

If your ELT has been inadvertently activated for more than 10 seconds, this must be reported to ATS or the RCC immediately (ERSA EMERG).

Telephone 1800 815 257 to report inadvertent ELT activation

Emergency use of ELTs

Refer to ERSA EMERG
Pre-flight briefing and notification

Pre-flight services

The pre-flight information service offers a range of services which are supported by NAIPS Internet Service (ERSA GEN PF). Information for the purposes of flight planning should be obtained through NAIPS Internet Service.

NAIPS is the National Aeronautical Information Processing System. It provides briefings and flight notification functions, supports a range of pre-flight information services and has a database of NOTAM and meteorological information.

If you require personal assistance regarding pre-flight information and services, the Briefing Office is available 24 hours a day on 1800 805 150. If you require NIS account assistance a National Help Desk is available 24 hours a day on 1800 805 150.

The service delivery options for pre-flight information and flight notification, in order of preference, are:

1. NAIPS Internet Service (NIS) – www.airservicesaustralia.com/naips/
2. AVFAX (weather & NOTAM only) – 1800 805 150 – option 1
3. METBRIEF (weather only) – 1800 805 150 – option 2
4. Submission of flight notification via fax – 1800 805 150 option 3
5. Personal briefing and submission of flight notification via phone – 1800 805 150 – option 4
6. By radio, where telephone facilities are not available.
NAIPS

Pre-flight briefing requirements

Remember that a weather forecast and NOTAMs are mandatory for flights away from the vicinity of an aerodrome (CAR 239) and, for VFR, an alternate must be provided for flights more than 50 nm from point of departure when forecast is below alternate minimum of 1500 ft ceiling and 8 km visibility (AIP ENR 1.1).

For specific flight plan track requirements at certain locations, see ERSA GEN FPR.

Internet briefings

Visit www.airservicesaustralia.com (click on Flight Briefing). You must be registered to obtain a user ID and password to be able to use NIS. A wide range of services are available and menu choices and online help are provided for unfamiliar users.

Enquiries

Call the National Help Desk on 1800 801 960 for further assistance.

You will be required to log in using your user ID and password to use the NAIPS internet service. The NIS provides the following information:

- Specific pre-flight information briefing (SPFIB);
- Full text NOTAM
- Location briefing
- Graphical area forecasts (GAFs)
- Special MET briefing
- General MET forecasts
- First light/last light calculations
- Wind/temperature profile
- Restricted area briefing
- Retrieve previous SPFIB
- Update SPFIB
- Update AVFAX briefing
- GPS RAIM (receiver autonomous integrity monitoring) availability
- NAIPS charts
- UTC time check and
- Flight notification using:
  - Stored flight file
  - SPFIB
  - Flight notification form
  - Domestic / ICAO flight plan and
  - SARTIME.

Note—An SPFIB is a briefing based on a route. The NOTAM and MET data presented are based on the set parameters of the route, time and height. The route can be either one stored in NAIPS and accessed via the route directory, or as described in the data entry form.
AVFAX products and custom codes can be accessed online via the NIS or by telephone. AVFAX has other MET products necessary for use in some operations (see ERSA GEN PF).

Each AVFAX briefing contains a reference number which can be used online, quoted to the briefing office, or in-flight to obtain an update on the original briefing.

To use AVFAX:

- Note which FIR and GAF areas cover your flight
- Use a tone dialling telephone to access AVFAX on 1800 805 150
- When AVFAX answers, enter your account number (to obtain an account number, pilots need to register with NIS or contact the Help Desk on 1800 801 960)
- When prompted, enter your password followed by the # key
- Enter the relevant Product Number and
- Follow the prompts until you hear the ‘thank you’ message.

Product Number and Prefix Group Code from are available in ERSA GEN PF 9-13.

**METBRIEF**

METBRIEF is a self-help system which delivers meteorological information on the telephone, using a computer-generated voice, in response to a tone-generated telephone request.

**METBRIEF**

T: 1800 805 150

**Personal briefing**

Briefing staff at the Flight Information Centre provide a flight notification acceptance service and a NOTAM, meteorological and other briefing information by telephone, or facsimile in response to requests for specific information.

**Personal briefing** T: 1800 805 150

**By radio**

Where telephone facilities are not available, FLIGHTWATCH and ATC provide an in-flight NOTAM and meteorological briefing service via air-ground communications channels to pilots unable to obtain information pre-flight, or who require an in-flight briefing update. This service only delivers information until the first point of landing where telephone facilities are available.
Weather briefings

This option is for weather briefings only.

**Weather briefing** Visit the Bureau of Meteorology website at [www.bom.gov.au](http://www.bom.gov.au)

**Note**—Airservices Australia is the official provider of the Aeronautical Information Service, which includes the delivery of the Bureau of Meteorology’s aviation meteorological products. Therefore, all information for the purpose of flight planning should be obtained from Airservices Australia.

Notice to airmen

**NOTAM**

As part of the network operations centre’s service, the NOTAM Office is responsible for issuing NOTAMs that provide information that is of direct operational significance and which may immediately affect aircraft operations. Distributed electronically, a **notice to airmen (NOTAM)** contains information concerning the establishment, condition or chance in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations (AIP GEN 2.2).

A pre-flight information service is provided from an office located in Canberra. This office provides a NOTAM, meteorological, and flight notification service. Some charges are applicable.

In Australia, description of the pre-flight information services available is contained in ERSA GEN.

In Australia, three types of NOTAMs are available to pilots (AIP GEN 3.3):

- Location NOTAMs, accessed by individual location identifier, for example **YBWW** for Brisbane West Wellcamp/li>
- FIR NOTAMs, which consists of NOTAMs applicable to individual FIRs – Brisbane (YBBB) or Melbourne (YMMM) and
- Head Office NOTAMs, accessed by the identifier YSHO and shown in the briefing results as Australia Gen (YBBB/YMMM).

**Note**—‘Trigger NOTAMs’ are Head Office NOTAMs that are allocated to a specific FIR or location.
A NOTAM is issued in a format with the following fields:

- Location identification
- Time of commencement of information or time of publication where prior notification is required. This date/time will then reflect the actual commencement time of the NOTAM information
- Time of cessation of information
- Times of periods of activity
- Plain language text
- Lower limit and
- Upper limit.

In the domestic environment, NOTAM numbering is preceded by the letter C followed by the number and year, for example: C0689/14.

For each location, a separate series of numbers is issued; thus the NOTAM is identified by the location identifier and the number, not by the number alone.

In the international environment, Australia issues NOTAMs against a series of registers. These registers are by individual FIRs, multiple FIRs, or Australia General. The individual FIRs and multiple FIRs registers are further subdivided by NOTAM category.

The NOTAM category series is as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Brisbane FIR—ATS and PRD NOTAMs</td>
<td>D</td>
</tr>
<tr>
<td>Brisbane FIR—all other NOTAMs</td>
<td>N</td>
</tr>
<tr>
<td>Melbourne FIR—ATS and PRD NOTAMs</td>
<td>E</td>
</tr>
<tr>
<td>Melbourne FIR—all other NOTAMs</td>
<td>F</td>
</tr>
<tr>
<td>Australia General FIR</td>
<td>G</td>
</tr>
</tbody>
</table>
NOTAM examples

Head Office NOTAMs
AUSTRALIA GEN (YBBB/YMMM)

C156/13 REVIEW C155/13
DAYLIGHT SAVING TIME EFFECTIVE IN THE STATES OF NEW SOUTH WALES,
SOUTH AUSTRALIA, TASMANIA, VICTORIA AND THE AUSTRALIAN CAPITAL
TERRITORY
FROM 10 051600 TO 04 051600

C46/13
D383 HR INFO ON AIS CHARTS AMD
VISUAL TERMINAL CHART (VTC) MELBOURNE, VISUAL NAVIGATION CHART (VNC)
MELBOURNE, TERMINAL AREA CHART (TAC) MELBOURNE AND ENROUTE CHART
LOW
(ERCL) 1:
DANGER AREA D383 HR TO READ ‘ERSA’
FROM 03 280351 TO PERM

FIR NOTAMS
BRISBANE FIR (YBBB)

C1969/13 REVIEW C1633/13
A/G FAC ACC/FIA BRISBANE CENTRE 135.5 (WHITSUNDAY ISLAND AREA) SUBJ
TO INTRP DUE INTERFERENCE
ALTN FREQ 133.2 OR AS ADZ BY ATC
FROM 12 170151 TO 03 170500 EST

LOCATION NOTAMS
TOWNSVILLE (YBTL)
TRIGGER NOTAM – AIP SUP H58/13
TOWNSVILLE RNP-AR PROPRIETARY PROCEDURES
AVBL FM AIRSERVICES WEBSITE
http://airservicesaustralia.com/aip/aip.asp (in lower case)
FROM 12 120412 TO 05 290300 EST
Note—This is a Head Office NOTAM, but allocated to a specific location.

ABN DECOMMISSIONED
FROM 02 130516 TO PERM

INCREASED BIRD HAZARD (MAGPIE GEESE) IN VCY OF AD
FROM 02 240427 TO 03 280100 EST
DAILY 2000/2230 0630/0900

OM ‘ITL’ 75 (RWY 01) NOT AVBL DUE MAINT
EXCEPT ON 30 MIN NOTICE FOR OPR RQMNTS
FROM 02 280100 TO 02 280500
Notification general

**Flight notification—methods of SARTIME nomination** AIP ENR 1.10

Pilots of VFR flights nominating a SARTIME to ATS, and those intending to operate in controlled airspace (except for VFR flights in Class E airspace) must submit flight details to ATS.

The order of preference for pilots to submit comprehensive flight notification is:

- through pilot access to NAIPS (via the internet)
- in writing
- by telephone or
- by radio to ATS.

Pilots submitting SARTIME flight notifications by fax must confirm receipt of the notification with the briefing office. Airservices strongly recommends that when any flight notification is submitted by fax, the pilot or operator telephones the briefing office before departure to confirm that it has been received.

Abbreviated details for operations in controlled airspace may be advised by radio if the flight is to operate locally, or operations will be for a brief duration. However, prior contact with ATC may avoid delays. Pilots may submit details by radio to ATS when associated with a clearance request, or to nominate a SARTIME.

When submitting flight notification by radio, pilots should be mindful of the need to minimise frequency congestion and transmit only that information required by the ATS for the current flight stage. Acceptance is subject to ATS workload and may be delayed.

Submission of comprehensive travel flight notification by radio is not a preferred method and should not be used when submission by some other means is available. Flight notification by radio for travel flights requiring the submission of comprehensive details will not be accepted at controlled aerodromes.

Pilots of VFR flights wishing to operate in other than class C or D airspace, and who wish to nominate a SARTIME, may submit details in the NAIPS SARTIME flight notification format (via the internet). If submitting the flight notification by fax or via telephone, the only form available is the Australian Domestic Flight Notification form.
Pilots may cancel a SARTIME via:
- telephone to CENSAR on 1800 814 931
- Flight Service or ATC when telephone facilities are not available or
- relay through another pilot.

**Flight notification—SARTIME requirements for VFR flights** AIP ENR 1.10

VFR flights in the following categories must submit a SARTIME flight notification to ATS, or, as an alternative, leave a Flight Note (see example on page 2.106) with a responsible person:
- Regular public transport and charter flights
- overwater flights
- flights in designated remote areas and
- flights at night proceeding beyond 120 nm from the aerodrome of departure.

VFR flights which are required to, or wish to, use a SARTIME may do so by providing ATS with the following details:
- callsign
- aircraft type
- departure point
- route to be flown
- destination
- POB and
- SARTIME.

**Note**—Only one SARTIME may be current at any time. To prevent the existence of multiple SARTIMEs for aircraft used by more than one pilot, SARTIMEs should be nominated immediately before the start of each flight.
VFR flights may operate on reporting schedules in the following circumstances:

- mercy flights
- flood, fire or famine relief flights
- overwater flights
- search and rescue flights and
- military flights.

Submission of flight details at least 30 minutes before estimated off blocks time (EOBT) is recommended.

Where notification of flight details, or changes to details, are submitted less than 30 minutes before EOBT, delays will be encountered when an ATC unit requires that the data be programmed into the computerised SSR code/callsign management system.

The following table identifies flight notification options for the various classes and types of operations when flying IFR or VFR:

<table>
<thead>
<tr>
<th>Flight category</th>
<th>Class of operation</th>
<th>Type of operation</th>
<th>Summary of flight notification options</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFR</td>
<td>Regular public transport and charter</td>
<td>All operations</td>
<td>SARTIME or Flight Note</td>
</tr>
<tr>
<td>VFR</td>
<td>Airwork and private</td>
<td>Overwater flights</td>
<td>SARTIME or Flight Note</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In designated remote areas</td>
<td>SARTIME or Flight Note</td>
</tr>
<tr>
<td></td>
<td></td>
<td>At night proceeding beyond 120 nm from the aerodrome of departure</td>
<td>SARTIME or Flight Note</td>
</tr>
<tr>
<td>VFR</td>
<td>Airwork and private</td>
<td>All other operations</td>
<td>SARTIME, Flight Note or no notification</td>
</tr>
</tbody>
</table>

To assist in managing the airways system, pilots should always warn ATS of any flight notification amendments by utilising appropriate alerting phraseologies, for example: ‘Flightwatch, delta mike golf, SARTIME flight plan amendment’.
Domestic flight notification

Forms AIP ENR 1.10
An example of, and instructions for, completing the Domestic Flight Notification Form is shown on the following pages.

In a number of cases (particularly in Item 19), completion is recommended as good practice. If mandatory Items are left incomplete, delays may occur.

The reverse side of the Flight Notification Form has a flight log/template to assist pilots in planning and navigation. It is not intended to be mandatory or prescriptive, and pilots may use any template, or other device, of their choice. Refer ENR 1.10.

Flight notification forms are available from the Airservices website: www.airservicesaustralia.com/flight-briefing

Flight rules AIP ENR 1.10
Flight rules must be indicated in any flight notification, except for VFR flights operating wholly outside controlled airspace and nominating a SARTIME.

PBN notification AIP ENR 1.10
No indication on the Flight Notification form is required for visual navigation or DR substitute applications of GNSS.

- Notification of PBN capabilities requires a combination of entries in Item 10 (Equipment and Capabilities) and Item 18 of the flight notification form. Guidance is provided in the Domestic flight notification form user guide.

Prior to conducting RNP AR operations in Australian administered airspace, foreign operators must apply to CASA (International Operations) for an “Authorisation: RNP-AR operations”. Foreign operators should not include any RNP AR capability in flight plan notification until so authorised by CASA.

POB
Pilots of VFR flights must include POB when submitting flight notification or when leaving a flight note, and are encouraged to notify ATS of any subsequent changes.
General

For flights not operating along an ATS route, estimated elapsed times should be provided for locations approximately 30 minutes or 200 nm apart.

Location data

Any location abbreviations used should be authorised abbreviations (that is, published in AIP).

If a common name is entered into NAIPS in lieu of an aerodrome abbreviation or navigational aid/waypoint, the flight notification output will assume that the aircraft is tracking over a navigational aid/waypoint and not the aerodrome, for example: the location Holbrook will translate to HBK, not YHBK.

Pilots entering details in terms of latitude and longitude, or using polar coordinates, must adhere to the correct format, for example: 2730S15327E.

Flight notification amendment  AIP ENR 1.10

When flight notification details have been previously notified to ATS, pilots should advise, as soon as possible, when there is any significant change to the following items:

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
<th>VFR in CTR/CTA</th>
<th>VFR wholly OCTA nominating a SARTIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Aircraft ident and/or registration</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>8</td>
<td>Flight rules to which flight will be operating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Serviceability of equipment carried</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>DEP aerodrome and EOBT—if the change exceeds 30 minutes</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>(DEP aerodrome only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 + 16</td>
<td>Route, landing points or alternate</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>15</td>
<td>Cruising level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Speed and estimated total elapsed time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Any change to: STS/PBN/NAV/RMY/ (incl. SARTIME)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>19</td>
<td>POB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Domestic Flight Notification Form user guide

Example of Domestic Flight Notification Form

Australian – Domestic Flight Notification Form

<table>
<thead>
<tr>
<th>7. Aircraft Identification</th>
<th>8. Flight Rules</th>
<th>Type of Flight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>F</td>
<td>R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9. No.</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>C072</td>
<td>N or S</td>
</tr>
<tr>
<td>Wake Cat</td>
<td>M</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10. Aircraft Identification</th>
<th>11. Flight Rules</th>
<th>Type of Flight</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>J</td>
<td>J</td>
<td>J</td>
</tr>
<tr>
<td>K</td>
<td>L</td>
<td>M</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13. DEP Aerodrome</th>
<th>EOBT</th>
<th>15. Cruising Speed</th>
<th>Level</th>
<th>16. DEST Aerodrome</th>
<th>Total EET</th>
<th>ALTN Aerodrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>YBAF</td>
<td>0000</td>
<td>0005</td>
<td>A</td>
<td>F</td>
<td>045</td>
<td>YBRK</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15. Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCT DBO MLY TNG DCT</td>
</tr>
<tr>
<td>DCT GLA MMB DBO DCT</td>
</tr>
</tbody>
</table>

| 18. | (Info relevant to Stage 2) |
|     |                             |

<table>
<thead>
<tr>
<th>13. DEP Aerodrome</th>
<th>EOBT</th>
<th>15. Cruising Speed</th>
<th>Level</th>
<th>16. DEST Aerodrome</th>
<th>Total EET</th>
<th>ALTN Aerodrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>YBRK</td>
<td>0330</td>
<td>0005</td>
<td>A</td>
<td>F</td>
<td>045</td>
<td>YBAF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15. Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCT GLA MMB DBO DCT</td>
</tr>
<tr>
<td>DCT GLA MMB DBO DCT</td>
</tr>
</tbody>
</table>

| 18. | (Info relevant to Stage 3) |
|     |                             |

| 18. | (Information relevant to all stages) |
|     | ----------------------------------- |

<table>
<thead>
<tr>
<th>DOP</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>PER</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>RMK / SARTIME</th>
<th>To ATS Unit</th>
<th>Location</th>
<th>DEST Tel No:</th>
</tr>
</thead>
<tbody>
<tr>
<td>230700</td>
<td>CENSAR</td>
<td>YBAF</td>
<td>ORGN/0000 000 123</td>
</tr>
</tbody>
</table>

Supplementary Information

<table>
<thead>
<tr>
<th>19. Endurance</th>
<th>Aircraft colour / markings</th>
<th>Persons on Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR</td>
<td>MIN</td>
<td>White/Red</td>
</tr>
<tr>
<td>05</td>
<td>00</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N/</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plot - in - command</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>C/</td>
</tr>
</tbody>
</table>
Item 7 — Aircraft identification

Enter: aircraft registration/flight number. ZZZZ and TBA cannot be accepted.

Requirements

For VH-registered aircraft, enter the three letters after the prefix only, for example: VH-ZFR enter ZFR.

For flight numbers, and other approved callsigns, enter a mixture of figures and letters not exceeding seven characters, for example: QF 611.

One callsign per flight notification.

Item 8 (a) — Flight rules

Circle:
I instrument flight rules (IFR)
V visual flight rules (VFR)
Y IFR then one or more changes of flight rules
Z VFR then one or more changes of flight rules

Requirements

If Y or Z is circled, an entry in Item 15 must specify where the change of flight rules will occur, for example: YBAF VFR.

Type of flight

Circle:
S scheduled air service
N non-scheduled air service
G general aviation
M military

Item 9 — Number of aircraft

Enter: number of aircraft where there is more than one, otherwise leave blank.

Type

Enter: aircraft type. Where more than one aircraft type is included in a formation, enter the type of the lowest-performance aircraft. Additional details regarding the formation must be inserted at Item 18.
Requirements
Use the two or four-letter ICAO-approved aircraft type abbreviations.

Note—Go to [www.icao.int/publications/DOC8643/Pages/default.aspx](http://www.icao.int/publications/DOC8643/Pages/default.aspx) for an extensive list of aircraft type abbreviations.

For aircraft type abbreviations not approved by ICAO, enter **ZZZZ** and specify the type of aircraft in Item 18 (b) preceded by **TYP/**.

**Wake turbulence category**

Circle:

- **H** heavy aircraft 136,000 kg MTOW or more
- **M** medium aircraft between 7000 and 136,000 kg MTOW
- **L** light aircraft 7000 kg MTOW or less

**Item 10—Nav/com equipment**

Circle to indicate the presence of serviceable equipment that the pilot is qualified to use:

- **N** no COM/NAV/approach aid equipment for the route to be flown, or the equipment is unserviceable
- **S** standard COM/NAV/approach aid equipment of VHF/ILS/VOR
- **A** GBAS landing system
- **B** LPV (APV with SBAS)
- **C** LORAN C
- **D** DME
- **E1** FMC WPR ACARS
- **E2** D-FIS ACARS
- **E3** PDC ACARS
- **F** ADF
- **G** GNSS
- **H** HF RTF
- **I** Inertial NAV
- **J1** CPDLC ATN VDL Mode 2
- **J2** CPDLC FANS 1/A HFDL
- **J3** CPDLC FANS 1/A VDL Mode A
- **J4** CPDLC FANS 1/A VDL Mode 2
- **J5** CPDLC FANS 1/A SATCOM (INMARSAT)
- **J6** CPDLC FANS 1/A SATCOM (MTSAT)
- **J7** CPDLC FANS 1/A SATCOM (Iridium)
- **K** MLS
- **L** ILS
- **M1** ATC RTF SATCOM (INMARSAT)
- **M2** ATC RTF (MTSAT)
- **M3** ATC RTF (Iridium)
- **O** VOR
### Notes

1. If the letter Z is used, specify the other equipment carried or other capabilities in Item 18, preceded by COM/, NAV/ and/or DAT/, as appropriate.

2. If the letter R is used, specify the performance-based navigation levels that can be met in Item 18 following the indicator PBN/.

3. The NAIPS interface does not currently support the use of P1, P2 and P3. Operators may only have to declare the RCP capability for flights that will operate in airspace administrated by States that require it.

Enter ‘G’ (GNSS) and ‘R’ (PBN capability) in Item 10 for aircraft equipped with a GNSS enabled area navigation system with additional entries as appropriate. The correlation between Item 10 and Item 18 entries for common PBN approvals is summarised below:

<table>
<thead>
<tr>
<th>PBN Capability</th>
<th>Item 10</th>
<th>Item 18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oceanic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RNAV10 (RNP10)</td>
<td>GR (if appropriate)</td>
<td>PBN/A1</td>
</tr>
<tr>
<td>RNP4</td>
<td>GR</td>
<td>PBN/L1</td>
</tr>
<tr>
<td>Continental</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RNP2</td>
<td>GZ</td>
<td>NAV/RNP2</td>
</tr>
<tr>
<td>Terminal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RNP1, all permitted sensors</td>
<td>GRDI</td>
<td>PBN/O1</td>
</tr>
<tr>
<td>RNP1, GNSS</td>
<td>GR</td>
<td>PBN/O2</td>
</tr>
<tr>
<td>Approach</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RNP APCH</td>
<td>GR</td>
<td>PBN/S1</td>
</tr>
<tr>
<td>RNP APCH with Baro-VNAV</td>
<td>GR</td>
<td>PBN/S2</td>
</tr>
<tr>
<td>RNP AR APCH with RF</td>
<td>GRI</td>
<td>PBN/T1 OPR/ (name)</td>
</tr>
<tr>
<td>Precision Approach</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GLS</td>
<td>AGZ</td>
<td>NAV/GLS</td>
</tr>
</tbody>
</table>
For the majority of Australian IFR operations the appropriate field 10 navigation entries will be:

S  Standard COM/NAV/Approach Aid combination of VHF/VOR/ILS, and

R  PBN capable, and

G  GNSS, and

Z  other equipment or capabilities (required to enable nomination of NAV/RNP2 in Item 18.

**Surveillance equipment**

Circle:

N  Nil or

Aircraft with ADS-B capability:

Enter: up to two ADS-B codes: either ‘L’ or ‘E’ and ‘B1’ or ‘B2’.

L  SSR Transponder Mode S, including aircraft identification, pressure altitude, ADS-B Out and enhanced surveillance capability.

E  SSR Transponder Mode S, including aircraft identification, pressure altitude and ADS-B Out capability.

B1  ADS-B “Out” capability using 1090MHz extended squitter

B2  ADS-B “Out” and “In” capability using 1090MHz extended squitter

**Note**—Enhanced surveillance capability is the ability of the aircraft to downlink aircraft derived data via a Mode S transponder.

Use the following table to determine the Field 10b entries for ADS-B transponder (use only one entry)
Mode S transponder with ADS-B

<table>
<thead>
<tr>
<th>Field 10b entry</th>
<th>Transponder Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mode S (ADS-B)</td>
</tr>
<tr>
<td>LB2</td>
<td>X X X X</td>
</tr>
<tr>
<td>EB2</td>
<td>X X</td>
</tr>
<tr>
<td>LB1</td>
<td>X X X</td>
</tr>
<tr>
<td>EB1</td>
<td>X X</td>
</tr>
<tr>
<td>L</td>
<td>X X</td>
</tr>
<tr>
<td>E</td>
<td>X X</td>
</tr>
</tbody>
</table>

Aircraft without ADS-B capability

Enter one SSR code representing the highest level of non-ADS-B surveillance capability available (in order highest is H then S, I, P, X, C and A is lowest).

- **H** SSR Transponder Mode S, including aircraft identification, pressure altitude and enhanced surveillance capability, identification capability.
- **S** SSR Transponder Mode S, including both pressure altitude and aircraft identification capability.
- **I** SSR Transponder Mode S, including aircraft identification, but no pressure altitude capability.
- **P** SSR Transponder Mode S, including pressure altitude, but no aircraft identification capability.
- **X** SSR Transponder Mode S with neither aircraft identification nor pressure altitude capability.
- **C** SSR Transponder Mode C
- **A** SSR Transponder Mode A

**Note**—Enhanced surveillance capability is the ability of the aircraft to down-link aircraft derived data via a Mode S transponder.
Mode S transponder without ADS-B

<table>
<thead>
<tr>
<th>Field 10b entry</th>
<th>Transponder Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mode S (non-ADS-B)</td>
</tr>
<tr>
<td>H</td>
<td>X</td>
</tr>
<tr>
<td>S</td>
<td>X</td>
</tr>
<tr>
<td>I</td>
<td>X</td>
</tr>
<tr>
<td>P</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**ADS-C**

Enter up to two ADS-C codes: ‘D1’ and/or ‘G1’

**D1** ADS-C with FANS 1/A capabilities

**G1** ADS-C with ATN capabilities

**Note**—The RSP specification(s), if applicable, will be listed in Item 18 following the indicator SUR/. Operators may only have to declare the RSP capability for flights that will operate in airspace administered by State that require it.

**Item 13—Departure aerodrome**

**Item 16—Destination aerodrome and total estimated elapsed time:**

**Alternate aerodrome**

Enter: aerodrome abbreviation in four letters.

**Requirements**

Enter the four-letter authorised abbreviation then, without a space, the total estimated elapsed time as four figures in hours and minutes, for example 0340. Include any aerial work delay noted as DLE in Item 18.

For aerodromes without an authorised abbreviation, enter ZZZZ.
In Item 18 enter **DEP/** (or as applicable **DEST/, ALTN/**) followed by either the:

- latitude and longitude of the aerodrome
- bearing and distance from a location with an authorised abbreviation
- first point of the route or
- marker radio beacon if the aircraft has not taken off from the aerodrome.

In item 18(a), enter the common name of the alternate location after **RMK/.**

**Note**—For bearing and distance, enter the designator of the location followed by three figures in degrees magnetic followed by three figures in nautical miles, for example BN270120 is a position 270 degrees 120 nm, from Brisbane.

Use of authorised aerodrome abbreviations for mobile locations may be suspended by NOTAM when not in the normal location. Pilots must enter **ZZZZ** and provide location details when the aerodrome abbreviation is suspended.

**Total EET**

Enter: total estimated elapsed time of the flight as four figures in hours and minutes, (for example **0340**) and include any aerial work delay noted as DLE in Item 18.

**AFIL**

AFIL (flight notification filed in the air) can be used instead of the departure aerodrome abbreviations when ATS services are only required for entry to, or to cross, controlled airspace. (Time of departure becomes an estimate for the point where the ATS service is to commence).

**Note**—For a flight plan received from an aircraft in flight, the total estimated elapsed time is the estimated time from the first point of the route to which the flight plan applies to the termination point of the flight plan.

**Estimated off blocks time**

Enter: estimated off blocks time (EOBT), or an estimate for the point where the ATS service is to commence (applicable for use with AFIL—as referred to above in the departure aerodrome section), in four-figure UTC.
Requirements
Enter: an EOBT for every flight stage as hhmm. All flights must also include DOF/ followed by the date of flight as yymmdd at Item 18, even if the date of the flight is the current day. EOBT/DOF more than 120 hours (five days) in advanced of the time of notification cannot be accepted. A change of more than 30 minutes to a submitted EOBT should be advised to ATS or through NAIPS.

Time of departure
Enter: estimated time of departure (ETD) in four-figure UTC, or an estimate for the point where the ATS service is to commence (applicable for use with AFIL—as referred to above in the departure aerodrome section).

Requirements
Enter: an ETD for every flight stage as ddhmm.
ETDs of more than seven days from the time of notification cannot be accepted. A change of more than 30 minutes to a submitted ETD should be advised to ATS or through NAIPS.

Item 15 – Cruising speed
Enter: TAS in knots or Mach number.

Requirements
Circle:
N then enter zero and three figures for knots, for example 0180;
M then enter zero and two figures for Mach number to the nearest hundredth of a unit, for example 082.

Level
Enter: first planned cruising level.

Requirements
Enter: either:
A followed by three figures to indicate altitude in hundreds of feet up to and including 10,000 ft. For example, A085 or
F followed by three figures to indicate flight levels above 10,000 ft.
For example, FL350.
**Item 15—Route**

Enter: details of the planned route, change of level, flight rules and cruise climb.

**Requirements for locations/waypoints**

For an aerodrome, use the authorised abbreviation, for example *YMBL* for Marble Bar. For a navaid identifier, use the published two or three-letter abbreviation, for example *KSC* for Kingscote NDB.

For a latitude and longitude identification, use degrees and minutes in an eleven-character group, for example: *2730S15327E*.

For a waypoint use assigned designator, for example: *CANTY*.

For bearing and distance, enter the designator of the location followed by three figures in degrees magnetic followed by three figures in nautical miles. For example, *BN270120* is a position 270 degrees 120 nm, from Brisbane.

**Requirements for route**

For the ATS route designator, enter the published chart designator, for example *B456*, *H62*.

Route details must start with DCT (direct) to indicate the flight is planned to track from the departure aerodrome (for example *YSCB* for Canberra), to the first en route point, then from the last en route point to the destination (for example *YSSY* for Sydney), DCT CB SY DCT.

When planning to track direct from the departure aerodrome to the destination aerodrome, that is without the use of navigational aids, enter DCT only.

When operating outside a designated ATS route, enter DCT followed by a significant point. For example, DCT PH CKL BIU PH DCT or DCT 1239S14325E 1300S14335E DCT.

When operating in a designated ATS route, enter the name of the location where the route is joined followed by the route designator, for example, on a flight departing Ceduna for Griffith via the route designators J149 and B469 enter DCT CD J149 WHA B469 GTH DCT in Item 15.

On survey work in a block or airspace, enter DCT followed by significant points to the survey area, included the point of commencement of the survey, then the point of exit from the survey area and the significant points to the destination, for example: DCT BN KCY GAYYGYM MC BN DCT.
When planning survey work, you must provide a map of the survey area to ATS with the flight notification.

When planning survey work, write in Item 18(b) the expected delay (DLA) at the commencement of the survey. For example, DLA/GAY 0130 indicates a delay at Gayndah for 90 minutes.

**Note**—A designated route begins and ends at the navaid except where the departure or destination is not serviced by a navaid.

Pilots should refer to AIP ENR 1.1 para 5 ‘Air route specifications’ and AIP ENR 1.1 para 4.

**Requirements for change of speed/level**

**Enter:** the significant point where the change will occur, followed by an oblique stroke, the cruise speed and the level, for example AY/N0130A080. Both cruise speed and level must be entered even if only one has changed.

**Requirements for change of flight rules**

**Enter:** details of a change to flight rules following the ‘for change’ entry in Items 8 of Y or Z.

**Enter:** the location where the change will occur followed by a space and VFR or IFR, for example: YBAF VFR.

Can accompany change in level, for example ROM/N018A090 IFR.

**Requirements for cruise climb/block level reservation**

**Enter:**

- the letter C followed by an oblique stroke, the point at which the cruise climb or reservation is planned to start, an oblique stroke, the speed to be maintained during the cruise climb or reservation and
- either:
  - the two levels defining the layer to be occupied during the cruise climb or block reservation or
  - one level and the word PLUS.

For example, C/FERET/N0380F370F390 or C/FERET/N0380F370PLUS.
**Item 18**

**Enter:** other information such as navaid training, block surveys and other plain language remarks of significance. Note that ACARS and TCAS or ACAS are not required to be included in the flight notification. Enter information in the sequence shown below:

- **STS/** Use for special aircraft handling, followed by one or more of the indicators set out in AIP ENR 1.10 – 21 Appendix 2 (Item 18) (STS/), separated by a space. For example, **STS/MEDEVAC NONRVSM.**

- **PBN/** Followed by RNAV and/or RNP capabilities. For more details, see AIP ENR 1.10 – 22 Appendix 2 (Item 18) (PBN/).

- **COM/** Followed by communication equipment or capabilities other than those listed for Item 10a. Use when Z has also been entered in Item 10a. For example, **COM/HF3452.**

- **DAT/** Followed by data applications or capabilities not specified in Item 10a. Use when Z has also been entered in Item 10a.

- **SUR/** Followed by surveillance applications or capabilities not specified in 10b.

- **DEP/** When ZZZZ has been entered in Item 13 followed by latitude and longitude or bearing and distance from a location with an authorised abbreviation. For example, **DEP/BN090120.**

- **DEST/** When ZZZZ has been entered in Item 16 followed by latitude and longitude or bearing and distance from a location with an authorised abbreviation. For example, **DEST/2730S1532E.**

- **DOF/** Followed by the full aircraft registration. For example, **REG/VHZFR.**

- **EET/** For international flights.

- **SEL/** Followed by the **special code**, for aircraft so equipped.

- **TYP/** When an approved aircraft type designator has not been assigned and ZZZZ has been entered in Item 9, enter **TYP/** followed by the aircraft type. For example, **TYP/Echo Mk 1.**

- **DLE/** Followed by the point where the aircraft will be operating and the estimated time in hours and minutes as a four-figure group, for example: **DLE/MDG0030 RMK/MDG NDB** indicates that the aircraft will be delayed at Mudgee for 30 minutes training on the NDB.

- **OPR/** Followed by the name on operator.
ORGN/ Followed by the originator’s eight-letter AFTN address or other appropriate contact details, such as a contact phone number when submitting a SARTIME.

PER/ Followed by the aircraft performance category as described in AIP ENR 1.5 para 1.2. For example, PER/B.

ALTN/ When ZZZZ has been entered in Item 16 followed by latitude and longitude or bearing and distance from a location when an approved abbreviation. For example, ALTN/2700S25320E.

RMK/ When any other plain language remarks are required or deemed necessary, followed, where applicable, by one or more of the indicators set out in AIP ENR 1.10 Appendix 2 (Item 18) (RMK/).

Item 19—Supplementary information

Enter: additional information relevant to the flight for search and rescue purposes (optional).

Endurance

Fuel endurance to be entered for each stage of flight in hours and minutes after E/. For example, 0430 hours.

Aircraft colour and markings

Used to record predominant colour and significant markings of the aircraft.

Survival equipment

Circle as follows:

P  First aid
D  Emergency rations
M  Water
J  Jackets
E  ELT 406 MHz

Dinghies

Enter: number of dinghies carried, the total capacity of all dinghies and their colour.
**Persons on board**

Enter:

- the total number carried for each flight;
- **TBN** if the number is to be advised after the time of filing flight notification.

**Remarks**

Provided for any additional survival equipment carried.

**Enter:** additional capabilities of life jackets and ELT beacon transmit frequencies as relevant:

- **L** Lights
- **F** Fluorescent
- **U** UHF radio on 243.0 MHz
- **V** VHF radio on 121.5 MHz

**Pilot in command**

The pilot in command should include telephone, mobile and fax numbers, and company name.

---

**Flight note**

A flight note is not submitted to Airservices as part of the ATS SARWATCH system, whereas an AVFAX or NIS flight notification is submitted to Airservices.

A flight note details the route and timing of a proposed flight and must be left with a person who can notify appropriate authorities if the flight is overdue.

Thus, a flight note does not provide an official SARWATCH but relies on the responsible person calling the AusSAR number (1800 815 257).

Note that, in order to be fully effective, complete details of the planned tracks and landing points should be provided on the flight note.
**Example of a flight note**

**FLIGHT NOTE**

The holder of this flight note should contact The Rescue Coordination Centre - Australia (RCC Australia) if the pilot has not arrived at the destination by the cancellation time shown below. Any delay could be crucial to the safety of the occupants of the aircraft.

**RCC Australia: 1800 815 257 (freecall)**

Note: All times are local at that location

PLEASE PRINT CLEARLY - USE BLACK INK IF POSSIBLE

<table>
<thead>
<tr>
<th>Latest cancellation time and final destination (local time)</th>
<th>Destination phone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1500</strong></td>
<td><strong>0000 000 123</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Call-sign</th>
<th>Type</th>
<th>TAS</th>
<th>Nav aids carried and used (include GPS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BJW</td>
<td>C-172</td>
<td>105 KT</td>
<td>VOR/NDB/GPS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pilot's name</th>
<th>Mobile phone No.</th>
<th>Home contact (name &amp; phone)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Smith</td>
<td>0000 000 123</td>
<td></td>
<td>15/8/15</td>
</tr>
</tbody>
</table>

Complete a separate line for each flight sector

<table>
<thead>
<tr>
<th>DEP AD / Point &amp; phone No.</th>
<th>EOBT (Local time)</th>
<th>Route (Turning points)</th>
<th>DEST &amp; phone No.</th>
<th>POB</th>
<th>Endurance Hr</th>
<th>Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>YGDI</td>
<td>0830</td>
<td>GDI-TWB-AF</td>
<td>YBBN</td>
<td>3</td>
<td>05 00</td>
<td></td>
</tr>
</tbody>
</table>

Remarks

(eg mobile phone numbers of passengers / registration if different from call-sign / any other useful information to aid Search and Rescue)

NOTE: REMEMBER TO TURN ON MOBILE PHONE AFTER LANDING

Communications and safety equipment on board (tick boxes as appropriate)

- 406 MHz Distress Beacon -
  - GPS equipped?
    - Yes
    - No
  - Registered with AMSA?
    - Yes
    - No

- Battery expiry date
  - / 00
  - / 00

- GPS
- First aid kits
- Water
- Emergency rations
- Life jackets
- Life rafts: Capacity
- Colour
- Ballistic Recovery System
- Satellite Tracking / Flight Following: Make/model

Other signalling / life-saving devices / tracking devices

<table>
<thead>
<tr>
<th>Aircraft colour / markings</th>
<th>Operating company name &amp; contact No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>White/Blue</td>
<td>Jane Smith, 0000 000 123</td>
</tr>
</tbody>
</table>

Copies of this form can be obtained from AMSA’s web site: www.amsa.gov.au/Forms/index.asp

AMSA 104 (12/10)
Flight information service

In-flight information

AIP GEN 3.3

Pilot responsibility
Pilots are responsible for requesting information necessary to make operational decisions (AIP GEN 3.3).

Operational information
Information about the operational aspects of the following subjects is normally available from ATS:
- meteorological conditions
- air routes and aerodromes, other than ALAs
- navigational aids
- communications facilities
- ATS procedures
- airspace status
- hazard alerts
- search and rescue services
- maps and charts and
- regulations concerning entry, transit and departure for international flights.

In-flight information
The in-flight information services are structured to support the responsibility of pilots to obtain information in-flight on which to base operational decisions relating to the continuation or diversion of a flight. The service consists of three elements:
- ATC-initiated FIS
- automatic broadcast services and
- on-request service.
**ATC-initiated FIS**

ATC-initiated FIS will include the provision of pertinent operational information such as:

- Meteorological conditions and the existence of non-routine MET products
- Changes to air routes
- Changes to serviceability of navigation facilities, for example RAIM
- Change to serviceability of communications facilities
- Changes in conditions of aerodromes and associated facilities
- Changes to airspace status and
- Information on medium and heavy unmanned free balloons.

**Note:** An ATC initiated FIS will only be provided to aircraft which will encounter the changed conditions within one hours’ flight time. The only exception to this is SIGMET information, which will be provided where the changed conditions will be encountered within two hours’ flight time.

**Automatic broadcast services**

The automatic broadcast services consist of:

- Automatic Terminal Information Service (ATIS)
- Automatic En Route Information Service (AERIS)
- Aerodrome Weather Information Service (AWIS) and
- Meteorological Information for Aircraft in Flight (VOLMET).

**ATIS**

At aerodromes specified in *ERSA* the normal operational information required by aircraft before take-off or landing is broadcast automatically and continuously either on a discrete frequency, or on the voice channel of one or more radio navigation aids. The broadcast may be pre-recorded or computerised.

When control zones are deactivated the ATIS may be used to broadcast operational information of an unchanging nature. This information may include the CTAF PAL frequency, preferred runways and noise abatement procedures. It may also include the expected reopening time of the tower. Pilots are encouraged to monitor the ATIS outside the normal hours of the tower.
The following information is transmitted on the ATIS:

**Terminal information** (aerodrome)

‘(Code letter)’, for example: ‘alpha’, ‘bravo’, etc; as assigned to each separately prepared transmission (zulu is not used).

‘(Time (hh mm)) UTC’, [('Time of observations (hh mm))'] (if appropriate).

‘(Type of approach expectation)’. For example, ‘expect ILS approach’.

**One runway in use**

‘Runway (number)’, ['damp'] ['wet'] ['water patches'] ['flooded'] (if applicable).

**More than one runway in use**

‘Runway/s (number/s) and (number/s) for arrivals’. 
‘Runway/s (number/s) and (number/s) for departures’, ['damp'] ['wet'] ['water patches'] ['flooded'] (if applicable).

‘Land and hold short operations in progress’ (when being used).

**Holding delay** (if appropriate), for example: ‘…minutes holding may be expected’.

**Curfew runway nomination**

When a runway is nominated due to noise abatement legislation and the crosswind and/or downwind component is in excess of that specified in ENR 1.1.

Crosswind and downwind components for the purposes of the above are:

- crosswind component, including gusts = 20 kt
- downwind component, including gusts = 5 kt and
- if the runway is not completely dry—downwind component > 0 kt.

**Wind direction**

Wind direction is quoted in degrees magnetic as either:

- **single mean direction** or
- **two values representing variation in wind direction** will be given whenever:
  - the extremes in wind direction vary by 60° or more or
  - the variation is considered to be operationally significant (for example the variation is less than 60°, but the variation from the mean results is either a downwind and/or significant crosswind component on a nominated runway).
‘variable’ will be used when the reporting of a mean wind direction is not possible, such as:
- in light wind conditions (3 kt or less) or
- the wind is veering or backing by 180° or more, for example passage of thunderstorms, or localised wind effect.

**Wind speed**

Wind speed is quoted as either:
- **calm** when less than 1 kt. For example, ‘wind calm’
- **single maximum value** whenever the extremes between minimum and maximum are 10 kt or less. For example, ‘wind 250 degrees maximum 25 knots’;
- **two values representing minimum and maximum values** whenever the extremes in wind vary by more than 10 kt. For example, ‘wind 250 degrees minimum 15 knots, maximum 28 knots’.

**Note**—When quoting a wind with variations in speed and direction, the above criteria may be varied in order to indicate the true crosswind and/or downwind.

Where threshold wind analysers are installed, and the wind at the threshold of a duty runway varies from that of the central wind analyser or the threshold wind on the other duty runway by criteria specified for the revision of ATIS, threshold winds may be broadcast on the ATIS, for example: ‘threshold wind runway (number), …/…, runway (number), …/…’.

Where runway threshold wind analysers are installed, a tower controller must provide a departing aircraft with the wind at the upwind area of the runway if it varies from the ATIS broadcast by 10° or 5 kt or more, and the variation is anticipated to continue for more than 15 min. Such information shall be passed by use of the phrase ‘wind at upwind end…/…’.

**Visibility**

Distance is reported as either:
- >10 km—‘greater than one zero kilometres’, or actual distance ‘(number) kilometres’.
- Greater than 5 km and 10 km (inclusive)—‘(number) kilometres’.
- Up to and including 5000 m—‘(number) metres’.
- <1500 m—runway visual range (RVR) is reported when available.
Present weather

Weather is reported as applicable. For example, ‘showers in area’ or:

CAVOK:
- **Cloud** (below 5000 ft or below MSA, whichever is greater; cumulonimbus, if applicable; if the sky is obscured, vertical visibility when available).
- **Temperature**
- **QNH**
- **[Other information]**
  - any available information on significant meteorological phenomena in the approach, take-off and climb-out, including the presence of freezing fog.
  - advice on hazard alert information including unauthorised laser illumination events.

ATIS broadcast

On first contact with (for example ['ground'], ['tower'], ['approach']) notify receipt of (code letter of the ATIS broadcast). This contact information may not be transmitted when recording space is limiting.

Wind shear

When moderate, strong or severe wind shear has been reported on the approach or take-off paths, or has been forecast, the information will be included on the ATIS in the following format. For example,

‘Wind shear warning—Cessna 210 [(wake turbulence category) category aircraft (if military ATIS)] reported moderate wind shear on approach runway 34 at time 0920’, (plus, if available, wind shear advice issued by MET, for example: ‘Forecast wind at 300 feet above ground level 360 degrees 45 knots’, or ‘Probable vertical wind shear from 0415 to 0430—forecast wind at 200 feet above ground level 110 degrees 50 knots’).

A **wind shear escape manoeuvre** is considered to constitute an emergency operation.
AERIS

The AERIS continuously broadcasts METAR from a network of VHF transmitters installed around Australia.

The information broadcast on the individual transmitters caters primarily for the needs of aircraft operating in control areas within VHF range of the facility.

Details of transmitter sites, frequencies and locations for which meteorological information is provided are at ERSA GEN-FIS and in this VFRG under Pre Flight Planning—Meteorology.

Aerodrome Weather Information Service (AWIS) and Weather and Terminal Information Reciter (WATIR) AIP GEN 3.5

AWIS and WATIR provide actual weather conditions via telephone and/or radio broadcast at specified locations. AWIS provides information from the AWS only. WATIR combines the AWS information with additional terminal information from the airport operator.

Basic AWS provide wind direction and speed, temperature, humidity, pressure setting and rainfall. Advanced AWS provide automated cloud and visibility information. Information provided in AWIS will contain some of the following:

- message identifier ‘AWS aerodrome weather’
- station identifier as a plain language station name
- wind direction in degrees magnetic and wind speed in knots
- altimeter setting (QNH)
- temperature in whole degrees celsius
- cloud below 10,000 ft*
- visibility*
- dew point in whole degrees celsius
- relative humidity
- runway visual range at selected locations^
- rainfall over the previous ten minutes and
- present weather information*.

* Provided as guidance material only. Pilots should exercise caution when interpreting automated visibility and cloud information as data from these instruments may not be equivalent to human observations.
Information broadcast from the AWS and WATIR is considered to be ‘real time’ data. When information is not available about a particular item, either because of invalid data or an inoperative sensor, the element of the broadcast will be identified as ‘Currently not available’. For example,

‘Temperature currently not available’.

The integrity of the barometric system in BoM-accepted AWS is such that they are an approved source of QNH. Therefore, QNH from these AWS may be used in accordance with ENR 1.5 to reduce the published minima for DME arrival procedures, and the published landing, circling and alternate minima. Information derived from other sensors within the AWS (for example: wind and temperature), does not have the same degree of integrity and should be used at pilot discretion.

When AWIS information is available after (tower) hours and the aerodrome is uncontrolled, reference will be made to its availability in ATIS ZULU.

The availability of AWIS and WATIR is contained in ERSA FAC and MET.

**On request service—Flightwatch**

An on-request FIS is available to aircraft in all classes of airspace on ATC VHF or HF (domestic and international) frequencies.

Pilots must prefix any request for FIS on ATC VHF frequencies with the callsign of the appropriate ATC unit and the generic callsign ‘Flightwatch’, for example:

‘Melbourne centre flightwatch request actual weather (location)’

Due to workload considerations, ATC may redirect pilot requests for FIS to an alternative VHF frequency or FLIGHTWATCH HF.

When operating on domestic HF (callsign ‘Flightwatch’) and international HF (callsign ‘Brisbane’), pilots must include the frequency on which they are calling. For example,

‘(Flightwatch or Brisbane), romeo juliet delta, six five four one, request actual weather (location)’.

Information will be provided in an abbreviated form, paraphrased into brief statements of significance. The full text of messages will be provided on request.
Alerting service

An alerting service will be provided (AIP GEN 3.3):

- for all aircraft provided with air traffic control services (on request and subject to ATC workload)
- in so far as practicable, to all other aircraft having filed a flight plan or otherwise known to the ATS and
- to any aircraft known or believed to be the subject of unlawful interference.

Surveillance information service (SIS)

SIS to VFR flights is available on request in Class E and Class G Airspace, subject to ATC workload. SIS is available to improve situational awareness and assist pilots in avoiding collisions with other aircraft (AIP GEN 3.3).

Pilots wanting SIS (AIP GEN 3.3):

- must be in direct VHF communications with ATC and equipped with a serviceable SSR transponder or ADS-B transmitter
- will be provided with traffic (detectable to ATC) information and upon request position or navigation information (advisory only);
- will be provided with an alerting service
- must, on initial contact, advise ATC and, if an ongoing service is requested, include the phrase ‘Request flight following’, and then, once ATC responds, advise position, level and intentions, after which (if SIS is available) SIS will commence
- in an emergency situation, should communicate using the prefix ‘Mayday Mayday Mayday’ and
- must, while receiving SIS, maintain a continuous listening watch with ATC and advise before leaving the frequency, and advise ATC before any changes to track or level.
Hazard alert

A sudden change to a component of FIS, not described in a current MET product or NOTAM, having an immediate and detrimental effect on the safety of an aircraft will be communicated by ATC using the prefix ‘Hazard alert’. Hazard alerts will (AIP GEN 3.3):

- be repeated at H+15 and H+45 in the hour following the initial transmissions
- normally cease after one hour, or after an updated MET product or NOTAM is available for dissemination, whichever is earlier and
- be directed to those aircraft maintaining continuous communications with ATS at the time the hazard is assessed and that are within one hour flight time of the hazardous conditions.

Hazard alert information, or its availability, will be directed or broadcast on the appropriate ATS frequencies.

For example:

‘All stations hazard alert Melbourne. Weather observation notifies unexpected deterioration below the IFR alternate minima’.

‘All stations hazard alert Dubbo. Pilot reports unexpected deterioration below the VFR alternate minima’.

When appropriate, ATC towers may provide advice about hazard alert information on the ATIS.

Information by pilots

A pilot in command becoming aware of any irregularity of operation of any navigational or communications facility or service or other hazard to navigation must report the details as soon as practicable. Reports must be made to the appropriate ATS unit except that defects or hazards on a landing area must be reported to the person or authority granting use of the area.

When a landing is made on a water-affected runway, the pilot is requested to advise ATS of the extent of water on the runway and the braking characteristics experienced.
## Terms to describe water on a runway

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damp</td>
<td>The surface shows a change of colour due to moisture</td>
</tr>
<tr>
<td>Wet</td>
<td>The surface is soaked but there is no standing water</td>
</tr>
<tr>
<td>Water patches</td>
<td>Patches of standing water are visible</td>
</tr>
<tr>
<td>Flooded</td>
<td>Extensive standing water is visible</td>
</tr>
</tbody>
</table>

## Terms to describe braking characteristics experienced

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>Pilots should not expect to find the conditions as good as when operating on a dry runway, but should not experience any directional control or braking difficulties because of runway conditions.</td>
</tr>
<tr>
<td>Medium</td>
<td>Braking action may be such that the achievement of a satisfactory landing or accelerate-stop performance, taking into account the prevailing circumstances, depends on precise handling technique.</td>
</tr>
<tr>
<td>Poor</td>
<td>There may be a significant deterioration both in braking performance and directional control.</td>
</tr>
</tbody>
</table>

During the bushfire danger period, pilots in command of an aircraft should notify the nearest ATS unit promptly of any evidence of bushfires observed which they believe has not been reported previously.
Plan your route thoroughly

Carry current charts and documents

**Before you fly**, always check:

- ERSA
- NOTAMs
- the weather
General information

Classes of airspace

AIP ENR 1.4

Airspace administration in Australia is generally aligned with the International Civil Aviation Organization (ICAO)—prescribed airspace classes and associated levels of service, as set out in Annex 11 to the Convention on International Civil Aviation (1944) (Chicago Convention). Differences to the ICAO classes of airspace in Australia are notified to ICAO and listed in the Australian Aeronautical Information Publication (AIP).

The various classes of airspace in Australia’s flight information regions (FIRs) are summarised in the table below:

**Classes of airspace in Australia’s FIRs**

<table>
<thead>
<tr>
<th>Class</th>
<th>Type of flight</th>
<th>Separation provided</th>
<th>Service provided</th>
<th>Speed limitation</th>
<th>Radio communication requirements</th>
<th>SUBJ ATC CLR</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>IFR</td>
<td>All aircraft</td>
<td>ATC service</td>
<td>N/A</td>
<td>Continuous two-way</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>VFR not permitted (see AIP ENR 1.7 and VFRG 3.5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>IFR</td>
<td>IFR from IFR, IFR from VFR, IFR from Special VFR</td>
<td>ATC service</td>
<td>250 kt below 10,000 ft AMSL, except where specified in ERSA, DAP or varied by ATC (see note 2)</td>
<td>Continuous two-way</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>VFR</td>
<td>VFR from IFR</td>
<td>ATC service for separation from IFR VFR/VFR traffic INFO (and traffic avoidance advice on request)</td>
<td>250 kt IAS below 10,000 ft AMSL</td>
<td>Continuous two-way</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Special VFR</td>
<td>Special VFR from special VFR, when VIS does not meet VMC</td>
<td>ATC service</td>
<td></td>
<td>Continuous two-way</td>
<td>Yes</td>
</tr>
<tr>
<td>Class</td>
<td>Type of flight</td>
<td>Separation provided</td>
<td>Service provided</td>
<td>Speed limitation</td>
<td>Radio communication requirements</td>
<td>SUBJ ATC CLR</td>
</tr>
<tr>
<td>-------</td>
<td>---------------</td>
<td>---------------------</td>
<td>------------------</td>
<td>-----------------</td>
<td>---------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>D</td>
<td>IFR</td>
<td>IFR from IFR</td>
<td>ATC service, traffic information about VFR flights</td>
<td>200 kt IAS at or below 2500 ft AAL within</td>
<td>Continuous two-way</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>VFR</td>
<td>Nil</td>
<td>ATC service, traffic INFO on all other flights</td>
<td>4 nm of the primary Class D aerodrome (see note 3)</td>
<td>Continuous two-way</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Special VFR</td>
<td>Special VFR from special VFR when visibility is less than VMC</td>
<td>ATC service</td>
<td>250 kt IAS in the remaining Class D airspace</td>
<td>Continuous two-way</td>
<td>Yes</td>
</tr>
<tr>
<td>E</td>
<td>IFR</td>
<td>IFR from IFR</td>
<td>ATC service and traffic info on VFR flights as far as is practicable</td>
<td>250 kt IAS below 10,000 ft AMSL</td>
<td>Continuous two-way</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>VFR</td>
<td>Nil</td>
<td>FIS SIS—flight following O/R (ATC workload permitting)</td>
<td>250 kt IAS below 10,000 ft AMSL</td>
<td>Continuous two-way</td>
<td>No</td>
</tr>
<tr>
<td>G N*</td>
<td>IFR</td>
<td>Nil</td>
<td>FIS</td>
<td>250 kt IAS below 10,000 ft AMSL</td>
<td>Continuous two-way</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>VFR</td>
<td>Nil</td>
<td>FIS SIS—flight following O/R (ATC workload permitting)</td>
<td>250 kt IAS below 10,000 ft AMSL</td>
<td>Continuous two-way</td>
<td>No</td>
</tr>
<tr>
<td>S†</td>
<td>IFR</td>
<td>Nil</td>
<td>FIS O/R</td>
<td>250 kt IAS below 10,000 ft AMSL</td>
<td>Continuous two-way</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>VFR</td>
<td>Nil</td>
<td>FIS O/R</td>
<td>250 kt IAS below 10,000 ft AMSL</td>
<td>Nil</td>
<td>No</td>
</tr>
</tbody>
</table>
Notes—if a radio is fitted to an aircraft it must be serviceable even though the carriage of a radio may not be mandatory

N* = on and north of 65° south
S† = south of 65° south

ATC can vary the speed at their discretion.

VFR altimetry

**Transition layer, altitude and level** AIP ENR 1.7

The system of altimetry used in Australia makes use of a transition layer between the transition altitude (which is always 10,000 ft) and the transition level which is typically FL110 (but can be up to F125 depending on the QNH) in order to separate aircraft that are using QNH from those using 1013.2 hPa as a pressure datum.

For all operations at or below the transition altitude, the altimeter reference will be:

- the current local QNH of a station along the route within 100 nm of the aircraft; or
- the forecast area QNH if the current local QNH is not known.

For cruising in the standard pressure region, the altimeter reference must be 1013.2 hPa.

The positions to change between QNH and 1013.2 hPa shall always be in the standard pressure region on climb after passing 10,000 ft and before levelling off, or on descent to a level in the altimeter setting region before entering the transition layer, and are shown in the following diagram.

QNH is available from a reporting station, the ATIS, TAF, ARFOR, AERIS or from ATS. Cruising within the transition layer is not permitted.

Flights cruising at or below the transition altitude must change the area QNH altimeter setting when advised of a change by ATS. Pilots of aircraft not using radio may obtain local QNH by setting the altimeter to aerodrome elevation before take-off.

**Note**—Setting the altimeter to the aerodrome elevation does not constitute an accuracy check of an altimeter if there is no reference made to an ‘accurate QNH’ (that is, QNH provided by ATIS, ATC or an AWS).
Area QNH

Area QNH is a forecast value which is valid for a period of three hours and normally applies throughout an area QNH zone (AQZ).

Area QNH zones will be subdivided, if necessary, to meet the following standards:

- Area QNH forecasts are to be within ± 5 hPa of the actual QNH at any low-level point (below 1000 ft AMSL) within or on, the boundary of the appropriate area during the period of validity of the forecasts.
- Area QNH must not differ from an adjoining area QNH by more than 5 hPa.

Local QNH

Local QNH, whether provided by ATS, AWS or aerodrome forecast (TAF) or by using the altimeter subscale to indicate airfield elevation AMSL, is used as shown above.
Altimetry phraseology

Heights measured from a QNH or area QNH datum must be expressed in full, for example: 3000 ft as ‘three thousand’ and 1800 ft as ‘one thousand eight hundred’ adding, if necessary, ‘on (QNH)’.

Expressions of height measured from the 1013.2 hPa datum must always include the words ‘flight level’.

Pre-flight altimeter check AIP ENR 1.7

Whenever an accurate QNH is available and the aircraft is at a known elevation, pilots must check the accuracy of the aircraft’s altimeter before take-off.

In order of priority, the pilot should use the following elevations for the check:

• tarmac
• threshold or
• airfield reference point elevation.

Note—if the first check indicates that an altimeter is unserviceable, the pilot is permitted to make a further check at another location on the airfield; for example, the first on the parking position and the second at the runway threshold (to determine altimeter serviceability).

VFR altimeters AIP ENR 1.7

With an accurate QNH set, a VFR altimeter(s) should read site elevation to within 100 ft (110 ft at test sites above 3300 ft) to be accepted as serviceable by the pilot.

If an aircraft fitted with two VFR altimeters continues to fly with one altimeter reading 100 ft (110 ft) or more in error, the faulty altimeter must be placarded as unserviceable and the error noted in the maintenance release.

VFR altimeters are not permitted for aeroplane operations above FL200. VFR flights operating above FL200 must be equipped with an altimeter calibrated to IFR standards.

Accurate QNH and site elevation

A QNH can be considered accurate if it is provided by ATIS, a tower or an automatic remote-reporting aerodrome sensor. Area or forecast QNH must not be used for the test.

Site elevation must be derived from aerodrome survey data published by Airservices Australia (see AIP DAP) or supplied by the aerodrome owner/operator.
Visual flight rules

Visual Flight Rules (VFR)

VFR flight may only be conducted (CAR 172, ENR 1.2):

- in VMC
- provided that, when operating at or below 2000 ft above the ground or water, the pilot is able to navigate by visual reference to the ground or water
- at sub-sonic speeds and
- in accordance with the speed restrictions identified at ENR 1.4

Unless the pilot in command is authorised under CASR Part 61 to conduct a flight under IFR or at night under VFR and the aircraft is appropriately equipped for flight at night or under the IFR, a VFR flight must not:

- be conducted at night (see the VFRG section Preflight planning-preparation-daylight and darkness) and
- depart from and aerodrome unless the ETA for the destination (or alternate) is at least 10 minutes before last light after allowing for any required holding.

Special VFR

By day, when VMC do not exist, the ATC unit responsible for a control zone may issue, at pilot request, a special VFR clearance for flight in the CTR, or in controlled airspace next to the CTR for the purpose of entering or leaving the CTR, providing (AIP ENR 1.2):

- the special VFR flight will not unduly delay an IFR flight
- the flight can be conducted clear of cloud
- the visibility is not less than
  - 1600 m for aeroplanes
  - 800 m for helicopters or
  - for balloons, not less than 100 m below 500 ft AGL and 1600 m at and above 500 ft AGL
- a helicopter is operated at such a speed that the pilot has adequate opportunity to observe any obstructions or other traffic in sufficient time to avoid collisions and
- the flight can be conducted in accordance with the requirements of CAR 157 regarding low flying.
Note—Special VFR is not permitted in Class E airspace

**Determination of visibility for VFR** CAR 174

Flight visibility shall be determined by the pilot in command from the cockpit of the aircraft while in flight.

Subject to CAR 257, the pilot in command of an aircraft operating under VFR is responsible for determining visibility for the take-off and landing of the aircraft.

In determining visibility for the purposes of this regulation, the pilot in command shall take into account the meteorological conditions, sun glare and any other condition that may limit their effective vision through their windscreen.

**Aerodrome meteorological minima** CAR 257

CASA may, in respect of an aircraft operation, determine the meteorological minima for the landing or taking off of an aircraft at an aerodrome. This information must be published in AIP or NOTAMs.

If an element of the meteorological minima for take-off or landing is less than that determined for the aircraft operation at the aerodrome, the aircraft must not take-off or land at the aerodrome.
Visual meteorological conditions

Visual Meteorological Conditions (VMC)—take-off, en route, and landing AIP ENR 1.2

VMC – controlled airspace – Class C

<table>
<thead>
<tr>
<th>Type of aircraft</th>
<th>Height</th>
<th>Flight VIS</th>
<th>Distance from cloud</th>
<th>Additional conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeroplanes, helicopters and balloons</td>
<td>At or above 10 000 ft AMSL</td>
<td>8 km</td>
<td>1500 m horizontal 1000 ft vertical</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Below 10 000 ft AMSL</td>
<td>5000 m</td>
<td>1500 m horizontal 1000 ft vertical</td>
<td>ATC may permit operations in weather conditions that do not meet these criteria (special VFR)</td>
</tr>
</tbody>
</table>

Source: AIP ENR 1.2
### VMC – controlled airspace – Class D

<table>
<thead>
<tr>
<th>Type of aircraft</th>
<th>Height</th>
<th>Flight VIS</th>
<th>Distance from cloud</th>
<th>Additional conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeroplanes, helicopters and balloons</td>
<td>Within Class D</td>
<td>5000 m</td>
<td>600 m horizontal, 1000 ft vertically above cloud; or 500 ft vertically below cloud</td>
<td>ATC may permit operations in weather conditions that do not meet these criteria (special VFR)</td>
</tr>
</tbody>
</table>

Source: AIP ENR 1.2
### VMC – controlled airspace – Class E

<table>
<thead>
<tr>
<th>Type of aircraft</th>
<th>Height</th>
<th>Flight VIS</th>
<th>Distance from cloud</th>
<th>Additional conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeroplanes, helicopters and balloons</td>
<td>At or above 10,000 ft AMSL</td>
<td>8 km</td>
<td>1500 m horizontal</td>
<td>1000 ft vertical</td>
</tr>
<tr>
<td></td>
<td>Below 10,000 ft AMSL</td>
<td>5000 m</td>
<td>1500 m horizontal</td>
<td>1000 ft vertical</td>
</tr>
</tbody>
</table>

Source: AIP ENR 1.2
VMC – non-controlled airspace – Class G

<table>
<thead>
<tr>
<th>Height</th>
<th>Flight VIS</th>
<th>Distance from cloud</th>
<th>Additional conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeroplanes, helicopters and balloons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1  At or above 10,000 ft AMSL</td>
<td>8 km</td>
<td>1000 ft vertical 1500 m horizontal</td>
<td></td>
</tr>
<tr>
<td>2  Below 10,000 ft AMSL (subject to items 3 and 4 on page 3.12)</td>
<td>5000 m</td>
<td>1000 ft vertical 1500 m horizontal</td>
<td></td>
</tr>
</tbody>
</table>
### VMC – non-controlled airspace – Class G (continued)

<table>
<thead>
<tr>
<th>Height</th>
<th>Flight VIS</th>
<th>Distance from cloud</th>
<th>Additional conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aeroplanes, helicopters and balloons continued</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>At or below (whichever is the higher) of:</td>
<td>5000 m</td>
<td>Clear of cloud and in sight of ground or water</td>
</tr>
<tr>
<td></td>
<td>(a) 3000 ft AMSL;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) 1000 ft AGL</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Balloons</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Below 1500 ft above ground or water</td>
<td>5000 m</td>
<td>Clear of cloud</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Below 500 ft above ground or water</td>
<td>100 m</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Source: AIP ENR 1.2
ATS surveillance services

Operating requirements for ADS-B transmitters AIP ENR 1.1

Pilots of aircraft fitted with a serviceable ADS-B transmitter which has been confirmed suitable to receive ADS-B-derived ATS surveillance services in Australia should activate the transmitter at all times during flight.

Note
1. Some ADS-B installations may share controls with the SSR transponder, meaning that independent operation of the two systems is not possible.
2. If it is not possible to comply with a particular instruction the pilot must advise ATC and request alternative instructions.

Aircraft equipped with ADS-B having an aircraft identification feature shall transmit the aircraft identification as specified in the flight notification or, when no flight notification has been filed, the aircraft registration.

Operation of transponders AIP ENR 1.6

Note—Background information on transponders and TCAS is shown in the VFRG section on—Radar transponders.

Except as indicated below, ATS will assign a temporary discrete code for each flight for aircraft operating in controlled airspace, and for aircraft participating in the Surveillance Information Service (SIS).

Unless otherwise advised by ATC, pilots of Mode 3A or Mode S transponder-equipped aircraft operating in Australian airspace must activate their transponders, and where a Mode C capability is also available it must be activated simultaneously with Mode 3A.

Pilots must ensure that transponders and ADS-B transmitters are activated and that altitude function is selected as:

- primary radar coverage only exists within 50 nm of major airports and the remainder of the ATS surveillance system relies on SSR transponder and ADS-B transmitter information and
- TCAS relies on transponder information for its pilot alerting and collision avoidance functions.
When operating in Australian airspace, transponder-equipped aircraft must select and use codes in accordance with the following criteria:

<table>
<thead>
<tr>
<th>Category</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil flights in Classes A, C and D airspace, or IFR flights in Class E airspace</td>
<td>3000</td>
</tr>
<tr>
<td>Civil IFR flights in Class G airspace</td>
<td>2000</td>
</tr>
<tr>
<td>Civil VFR flights in Class E or G airspace</td>
<td>1200</td>
</tr>
<tr>
<td>Military flights in Classes A, C, D or E airspace</td>
<td>5000</td>
</tr>
<tr>
<td>Military flights in Class G airspace</td>
<td>6000</td>
</tr>
<tr>
<td>Civil flights not involved in special operations or SAR, operating in Class G airspace in excess of 15 nm offshore</td>
<td>4000</td>
</tr>
<tr>
<td>Civil flights engaged in littoral surveillance</td>
<td>7615</td>
</tr>
<tr>
<td>Ground testing by aircraft maintenance staff</td>
<td>2100</td>
</tr>
<tr>
<td>Flights operating at aerodromes (in lieu of the first three of this list when assigned by ATC)</td>
<td>0100</td>
</tr>
<tr>
<td>RPAS in all classes of airspace and when instructed to enable transponder</td>
<td>7000</td>
</tr>
</tbody>
</table>

Pilots of flights which will require an SIS and/or a clearance into controlled airspace, and for which a discrete code has already been coordinated, must select that code immediately before making their SIS/clearance request.

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

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

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

**Transponder emergency codes** AIP ENR 1.6

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

The pilot of an aircraft losing two-way communications must set the transponder to code 7600.
A radar controller observing a 7600 code shall request the pilot to ‘squawk IDENT’ (which means to activate the SPI function). If the identification signal is received, further control of the aircraft will be continued using the identification transmission to acknowledge receipt of instructions issued.

If the identification is not received, the aircraft must continue with the transponder on code 7600 and follow radio failure procedures set out in the VFRG section *Emergency procedures-communications failure*.

**Radio communications procedures** AIP ENR 1.6

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

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

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

**Identification procedures** AIP ENR 1.6

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

**Vectoring procedures** AIP ENR 1.6

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

Aircraft will normally be vectored on routes along which the pilot can monitor navigation.

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

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

When an aircraft reports unreliable directional instruments, the pilot will be asked, before being issued with manoeuvring instructions, to make all turns at an agreed rate and to carry out the instructions immediately on receipt.
When aircraft are being vectored, the controller will assign altitudes which allow for terrain clearance. However, in VMC by day, an aircraft may be permitted to arrange its own terrain clearance. In such instances the aircraft will be instructed to:

\[ \text{Turn left (or right) heading (heading)} \] \[ \text{climb (or descend) to (level) visual} \].

Pilots being vectored will be routinely advised of their position to enable pilot navigation in the event of radio or ATS surveillance system failure.

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

Before take-off, ATC may assign a heading for a departing aircraft to assume after take-off, followed by frequency change instructions if appropriate. Headings, other than those assigned for a standard radar SID, will only be issued for a visual departure by day in VMC.

Arriving aircraft may be vectored to:

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

### VASIS

**Visual approach slope indicator systems (VASIS)** AIP AD 1.1

Two types of VASIS are approved for use in Australia:

- T-VASIS – a high-intensity system for use by day or night; and
- PAPI – a colour discrimination system usable by day or night.

The standard installation aims to provide an obstacles clearance of at least 11 m above a 1.9° slope, within the azimuth splay of 7.5° either side of the runway centre line for a distance of a 5 nm from the threshold (7 nm for a runway equipped with an ILS).

When the installation differs from the standard, details are promulgated in the aerodrome documentation.
T-VASIS

The cross-bar indicates on-slope, and deviations appear as one, two or three lights above or below the cross-bar. The sensitivity is similar to the ‘dot positions’ on an ILS glide path.

Increased eye height over the threshold can be achieved by flying the approach with one or more of the ‘fly-down’ lights visible.

<table>
<thead>
<tr>
<th>Approach slope indication</th>
<th>Eye height above threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 lights fly up</td>
<td>0 to 7 ft</td>
</tr>
<tr>
<td>2 lights fly up</td>
<td>7 to 25 ft</td>
</tr>
<tr>
<td>1 light fly up</td>
<td>25 to 41 ft</td>
</tr>
</tbody>
</table>

On glide slope: 49 ft

| 1 light fly down           | 57 to 75 ft                |
| 2 lights fly down           | 75 to 94 ft                |
| 3 lights fly down           | 94 to 176 ft               |

Notes

The night azimuth splay is normally increased to 30° to permit T-VASIS to be visible on base leg. However, obstacle clearance is not guaranteed until the aircraft is within the runway approach obstacle limitation surface. Accordingly, T-VASIS should not be used for approach slope guidance until the aircraft is aligned with the runway.

The presence of a thin layer of ground fog or mist may produce abnormal T-VASIS indications, including erroneous fly-down or fly-up signals, or other fly-up or fly-down lights together with the correct lights (which are usually much brighter than the erroneous lights). Consequently, pilots should exercise caution when using the T-VASIS in ground fog or other conditions conducive to light reflection or refraction.

The above requirements may vary by 15 ft depending on the location of the system.

The intensity of the system can be varied at the request of the pilot.

An abbreviated version of T-VASIS, AT-VASIS, is used at some locations, with the equipment located on one side only of the runway (usually the left).
### T-VASIS

#### On glide slope

<table>
<thead>
<tr>
<th>Slightly high</th>
<th>Slightly low</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>High</th>
<th>Low</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Very high</th>
<th>Very low</th>
</tr>
</thead>
</table>
PAPI

A PAPI (precision approach path indicator) installation consists of a set of four light boxes placed in a line at right angles to the runway, abeam the touchdown point and usually on the left-hand side. Each box radiates both red and white light. The transition between the red and white will appear instantaneous to the pilot (three minutes of arc); however, light changes between adjacent boxes will not occur unless the approach slope changes by about 0.25 degrees. A one degree progressive incremental spread from the outermost to the innermost light unit about the standard approach angle provides the visual guide shown below.
Class G communications

Listening watch

For the entire period from which you taxi a VHF radio-equipped aircraft onto the aerodrome’s manoeuvring area (see page 1.25) until the aircraft is brought to a complete stop at the point of termination of the flight, you must maintain a ‘listening watch’ using the aircraft’s VHF radio (CAR 243).

Furthermore, whenever you are flying a VHF radio-equipped aircraft in the vicinity of a non-controlled aerodrome, you must make a broadcast whenever it is necessary to avoid a collision or the risk of a collision with another aircraft (CAR 166C).

Frequency management

When operating in the vicinity of an aerodrome published on aeronautical charts, use the CTAF (MULTICOM 126.7MHz or the discrete frequency) as published.

Anywhere within a Broadcast Area, use the dedicated Broadcast Area CTAF.

Otherwise, it is recommended pilots use the Area VHF. This frequency may provide the best means of gaining assistance from ATC or other pilots in the event of an emergency. In the vicinity of uncharted aerodromes, pilots have discretion to use the most appropriate frequency that ensures safe operation. This may be MULTICOM 126.7MHz. However, pilots should be aware that transiting aircraft may be monitoring Area VHF. To ensure mutual traffic awareness, it is recommended that pilots using an alternative frequency also monitor Area VHF.

You are ‘in the vicinity’ of an aerodrome if you are flying:

- within 10 nm of an aerodrome, and
- at a height above the aerodrome that could result in conflict with operations at the aerodrome.

In the vicinity of an aerodrome, the most hazardous area for a collision is within a cylinder of airspace 5 nm in diameter and up to 3000 ft above the aerodrome.
Radiotelephony requirements

Radio broadcasts

A broadcast must include (CAR 166C):

- the name of the aerodrome
- the aircraft’s type and callsign and
- the position of the aircraft and the pilot’s intentions.

All pilots of aircraft carrying a VHF airband radio should make broadcasts as required depending on traffic in the area in accordance with the following table:

<table>
<thead>
<tr>
<th>Circumstance (non-controlled aerodromes)</th>
<th>Pilot radio broadcasts</th>
</tr>
</thead>
<tbody>
<tr>
<td>The pilot intends to take off</td>
<td>Immediately before, or during, taxiing</td>
</tr>
<tr>
<td>The pilot intends to enter a runway</td>
<td>Immediately before entering a runway</td>
</tr>
<tr>
<td>The pilot is inbound</td>
<td>10 nm or earlier from the aerodrome, commensurate with aircraft performance and pilot workload, with an estimated time of arrival (ETA) for the aerodrome</td>
</tr>
<tr>
<td>The pilot is ready to join the circuit</td>
<td>Immediately before joining the circuit</td>
</tr>
<tr>
<td>The pilot intends to carry out a straight-in approach; or join on base leg</td>
<td>On final approach at not less than 3 nm from the threshold before joining on base</td>
</tr>
<tr>
<td>The pilot intends to fly through the vicinity of, but not land at, a non-controlled aerodrome</td>
<td>When the aircraft enters the vicinity of the aerodrome (as defined)</td>
</tr>
</tbody>
</table>

Note—Some distances above refer to the runway threshold and others to the aerodrome reference point (ARP). Pilots should be aware that a global positioning system (GPS) indication of 3 nm from an aerodrome may not be 3 nm to the runway threshold.
Radiotelephony requirements outside controlled airspace
AIP ENR 1.1, AIP GEN 3.4

The callsign of the station or service being called must be included at the beginning of each exchange on VHF and HF. For examples, see the table below.

For initiating communication to a unit or station

<table>
<thead>
<tr>
<th>Circumstances</th>
<th>Phraseologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>If your callsign is IMZ and you wish to:</td>
<td></td>
</tr>
<tr>
<td>Initiate communication with another aircraft in the area with the callsign BUQ</td>
<td><strong>Bravo Uniform Quebec, India Mike Zulu</strong></td>
</tr>
<tr>
<td>Initiate communication with ATS, for example Brisbane Centre</td>
<td><strong>Brisbane Centre, India Mike Zulu</strong></td>
</tr>
<tr>
<td>Request operational information on FIS frequencies (AIP ENR 1.1)</td>
<td><strong>Flightwatch, India Mike Zulu</strong></td>
</tr>
</tbody>
</table>

All transmissions between aircraft should be prefixed with the aircraft callsign. When calling FLIGHTWATCH add the frequency in use to the initial transmission. This assists the operator in monitoring multiple frequencies.

When initiating a transmission with ATS, an ATS unit will respond using your callsign followed by their callsign. In the absence of an instruction to ‘stand by’, this response by the ATS unit is an invitation for the aircraft calling to pass their message (AIP GEN 3.4).

**Note**—The use of the words ‘go ahead’ is no longer appropriate due to the possibility of misconstruing ‘go ahead’ as an authorisation for an aircraft to proceed.

For initiating a broadcast of information intended for multiple units and stations

<table>
<thead>
<tr>
<th>Circumstances</th>
<th>Phraseologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>If your callsign is IMZ and you wish to transmit a broadcast to all stations on the frequency, including:</td>
<td></td>
</tr>
<tr>
<td>Location specific information, for example, at Wellcamp CTAF (AIP GEN 3.3)</td>
<td><strong>All stations Wellcamp, India Mike Zulu</strong></td>
</tr>
<tr>
<td>AIP GEN 3.4</td>
<td><strong>Wellcamp traffic, India Mike Zulu</strong></td>
</tr>
<tr>
<td>General information</td>
<td><strong>All stations, India Mike Zulu</strong></td>
</tr>
</tbody>
</table>

**Note**—The term ‘traffic’ refers to aircraft, while ‘stations’ may also refer to ATS agencies, CA/GRS, UNICOM and vehicles on the ground.

■ Pilot transmission
When broadcasting information, you must include (CAAP 166-01):

- the name of the aerodrome
- the aircraft’s type and callsign and
- the position of the aircraft and your intentions.

The standard broadcast format for low and medium-performance aircraft is (AIP ENR 1.1, CAAP 166-01):

- location ‘traffic’
- aircraft type
- callsign
- flight rules (if IFR)
- position and intentions then
- location.

Where more than one aerodrome is used on a CTAF frequency, prefixing the message with the location followed by the word ‘traffic’ (for example: ‘Caboolture traffic’) and then adding the location again on its own at the end of the message (for example: ‘Caboolture’) helps to confirm the location.

**Read-back requirements** AIP GEN 3.4

Pilots must transmit a correct read-back of ATC clearances, instructions and information which are transmitted by voice. Apart from the first item of the list below, only key elements of the following clearances, instructions, or information must be read back. Ensure you include sufficient detail to indicate compliance (that you have adequately understood the message):

- an ATC route clearance in its entirety, and any amendments (‘rest of clearance unchanged’ is not required to be read back)
- en route holding instructions
- any route and holding point specified in a taxi clearance
- any clearances, conditional clearances, or instructions to do any of the following manoeuvres on any runway:
  - hold short of
  - enter
  - land on
  - line up on
  - wait
  - take off from
  - cross
  - taxi or
  - backtrack on
any approach clearance

assigned runway, altimeter settings, directed to specific aircraft, radio and radio navigation aid frequency instructions (an ‘expectation’ of the runway to be used is not to be read back)

SSR codes, data link logon codes and

level instructions, direction of turn, heading and speed instructions.

The controller will listen to the read-back to ascertain that the clearance or instruction has been correctly acknowledged and will take immediate action to correct any discrepancies revealed by the read-back. Reported level figures of an aircraft must be preceded by the words ‘flight level’ when related to standard pressure and may be followed by the word ‘feet’ when related to QNH.

**Standard format**

The standard broadcast format for low and medium-performance aircraft is as per the following example:

<table>
<thead>
<tr>
<th>(Location) traffic</th>
<th>Parkes traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Aircraft type)</td>
<td>Cessna 172</td>
</tr>
<tr>
<td>(Call sign)</td>
<td>Zulu Foxtrot Romeo</td>
</tr>
<tr>
<td>(Position/intentions)</td>
<td>One-zero miles north inbound, on descent through four-thousand two-hundred, estimating the circuit at three-six</td>
</tr>
<tr>
<td>(Location)</td>
<td>Parkes</td>
</tr>
</tbody>
</table>

**Variety of callsigns used** AIP GEN 3.4

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

<table>
<thead>
<tr>
<th>Passenger transport</th>
<th>‘Q-link 2719’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreational</td>
<td>‘Jabiru 5234’</td>
</tr>
<tr>
<td>Military</td>
<td>‘Stallion 22’</td>
</tr>
<tr>
<td>Law enforcement</td>
<td>‘Polair 5’</td>
</tr>
<tr>
<td>Foreign-registered</td>
<td>‘November 15 Yankee’</td>
</tr>
<tr>
<td>VH-ZFR</td>
<td>‘Zulu Foxtrot Romeo’</td>
</tr>
</tbody>
</table>
Interpilot air-to-air communication

In accordance with regional agreements, 123.45 MHz is the designated air-to-air VHF communications channel. Use of this channel will enable aircraft engaged in flights over remote and oceanic areas out of range of VHF ground stations to exchange necessary operational information and facilitate the resolution of operational problems (AIP GEN 3.4).

CTAF

Common traffic advisory frequency (CTAF), and procedures at non-controlled aerodromes AIP ENR 1.1

The CTAF is the frequency on which pilots operating at a non-controlled aerodrome should make positional radio broadcasts. If a discrete frequency is not listed use 126.7 MHz. These frequencies are not normally monitored by ATS.

To achieve the greatest degree of safety, CAR 166C requires pilots of aircraft carrying a serviceable radio which they are qualified to use 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 at a non-controlled aerodrome. In certain circumstances carriage of radio and being qualified to use it are mandatory. Refer to the table on page 3.30 for report and broadcast requirements.

Pilots of higher-performance aircraft, or pilots operating at busy aerodromes, are encouraged to monitor/broadcast on the CTAF earlier to allow sufficient time to gain situational awareness of the traffic.

Note—The responsibility for collision avoidance, sequencing, and knowledge of local procedures lies solely with the pilot in command. Aircraft overflying a non-controlled aerodrome should avoid the circuit area, and the routes commonly flown by arriving and departing traffic.

Where a number of non-controlled aerodromes are in close proximity, a single discrete CTAF may be allocated to those aerodromes. Where a discrete CTAF is prescribed, these frequencies are shown in ERSA and ERC Low charts. For charted aerodromes where no specific frequencies is prescribed the default CTAF is 126.7 MHz. For uncharted aerodromes the area frequency should be used for traffic communication whenever it is reasonably necessary to do so to avoid a collision or risk of collision with another aircraft.

When a UNICOM service is provided at a non-controlled aerodrome and the UNICOM is the CTAF, ERSA identifies the frequency as CTAF/UNICOM.
AFRU

**Aerodrome frequency response unit** AIP GEN 3.4

To assist pilots’ awareness of inadvertent selection of an incorrect VHF frequency when operating into non-controlled aerodromes, a device known as an aerodrome frequency response unit (AFRU) may be installed. An AFRU will provide an automatic response when pilots transmit on the CTAF for the aerodrome at which it is installed.

The features of the AFRU are as follows:

- When the aerodrome traffic frequency has not been used for the previous five minutes, the next transmission over two seconds long will cause a voice identification to be transmitted in response, for example: ‘Goulburn CTAF’.
- When the aerodrome traffic frequency has been used within the previous five minutes, a 300-millisecond tone will be generated after each transmission over two seconds long.

A series of three microphone clicks within a period of five seconds will also cause the AFRU to transmit a voice identification for the particular aerodrome.

If the transmitter in the AFRU is jammed for a period of more than one minute, the unit will automatically shut down.

The AFRU improves safety by confirming the operation of the aircraft’s transmitter and receiver, the volume setting, and that the pilot has selected the correct frequency for use at that aerodrome.

CA/GRS

**Certified air/ground radio service** AIP GEN 3.4

A certified air/ground radio service (CA/GRS) is an aerodrome-based radio information service, which may operate at non-controlled aerodromes. The service provides pilots with operational information relevant to the particular aerodrome. The service is operated by or for the aerodrome operator within the published hours, on the CTAF assigned to the particular aerodrome. It is not an Airservices Australia or RAAF-provided air traffic service.

The CA/GRS does not provide any separation advice. The callsign of the service is the aerodrome location followed by ‘radio’; for example: ‘Ayers Rock radio’.

The radio service operators have been certified to meet a CASA standard of communication technique and aviation knowledge appropriate to the service being provided.

The CA/GRS is provided to all aircraft operating within the designated broadcast area for the specific location. Refer to ERSA for the location-specific designated broadcast areas.

When a CA/GRS is operating, pilot procedures are unchanged from the standard non-controlled operating and communication procedures. ERSA includes location-specific information related to procedures.

The CA/GRS information helps pilots to make informed operational decisions. Pilots retain authority and responsibility for the acceptance and use of the information provided.

Aircraft making the normal inbound or taxiing broadcast receive a responding broadcast from the CA/GRS operator, conveying the following information:

- confirmation of correct CTAF
- current known, relevant traffic in the vicinity of the aerodrome and on its manoeuvring area. Traffic information may include some or all of the following information
  - the aircraft type, callsign, position and intention or
  - where circuit flying is in operation, general advice on the number of aircraft in the circuit, and position in the circuit if relevant.

  **Note**—This information is provided to assist pilots in arranging traffic separation.

- weather conditions and operational information for the aerodrome.
  This may include:
  - runway favoured by wind or noise abatement
  - runway surface conditions
  - wind direction and speed
  - visibility and present weather
  - estimated cloud base
  - aerodrome surface temperature and
  - aerodrome QNH.

This information will be provided by means of an automatic aerodrome information service (AAIS) broadcast on a discrete published frequency (similar to ATIS) during CA/GRS operating hours, or on request to the CA/GRS operator.
Pilots should monitor the published AAIS frequency before making a taxiing or inbound broadcast and indicate that the AAIS information has been received when making an inbound or taxiing broadcast.

Other local operational information, relevant to the safety of operations at the aerodrome, will also be broadcast.

The CA/GRS will provide emergency services call-out if requested by the pilot in an emergency or, if in the opinion of the operator, a call-out is warranted.

The weather information provided by the service is derived from approved measuring equipment, which meets BoM aeronautical precision standards. QNH provided by a CA/GRS, or AAIS may be used to reduce landing, circling and alternate minima in accordance with AIP ENR 1.5 (QNH Sources).

The CA/GRS operator may act as a representative of an air operator (where formal agreement with the operator has been established) for the purposes of holding SARWATCH.

### UNICOM

**AIP GEN 3.4**

Universal communications (UNICOM) is a non-ATS communications service to improve the information normally available about a non-controlled aerodrome.

The primary function of the frequency used for UNICOM services where the frequency is the CTAF is to give pilots the means to make standard positional broadcasts when operating in the vicinity of the aerodrome. Participation in UNICOM services must not inhibit the transmission of standard positional broadcasts.

Participation in UNICOM services relates to the exchange of messages concerning:

- fuel requirements
- estimated times of arrival and departure
- aerodrome information
- maintenance and servicing of aircraft, including the ordering of parts and materials urgently required
- passenger requirements
- unscheduled landings to be made by aircraft
- general weather reports and
- basic information on traffic.
This information is available to all aircraft during the times when the UNICOM is operating.

Weather reports, other than simple factual statements about the weather, may not be provided by UNICOM operators unless they are properly authorised to make weather observations under CAR 120.

The UNICOM operator is solely responsible for the accuracy of any information passed to an aircraft, while the use of information obtained from a UNICOM is at the discretion of the pilot in command.

Stations providing a UNICOM service must be licensed by the Australian Communications and Media Authority (ACMA). Detailed information regarding the licensing and use of equipment may be obtained by contacting ACMA in the appropriate state or territory capital city.

UNICOM operators must comply with the requirements of CAR 83 (2).

Airmanship

Listening to other pilots’ broadcasts increases situational awareness and helps you to see and avoid 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. A pilot should not hesitate 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, have selected the wrong radio, have a microphone failure, or have the volume turned down.

Make calls as clearly and concisely as possible using the standard phraseology. Speak at a normal pace, as rapid speech can make transmissions difficult for other pilots to understand. Be careful not to ‘clip’ your transmission when stating your location as confusion can arise at aerodromes that are close together and share the same CTAF.

Ideally pilots should make circuit broadcasts before 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’.
Make broadcast calls brief and clear. Think about what to say before transmitting. Make positional and other broadcasts necessary to minimise traffic conflict 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 (a near collision).

Avoid the use of local terminology in position reports, for example: use ‘Bundaberg’ instead of ‘Bundy’.

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

### Summary

**VFR operations in Class E and G airspace** AIP ENR 1.1

**Summary of reports and broadcasts – VFR aircraft in Classes E and G airspace**

<table>
<thead>
<tr>
<th>Situation</th>
<th>FREQ to use</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>For clearance into controlled airspace</td>
<td>ATC</td>
<td>Report</td>
</tr>
<tr>
<td>Before and on completion of overwater stage</td>
<td>ATS</td>
<td>Report (if requesting schedules)</td>
</tr>
<tr>
<td>CAR 166C requires a pilot to make a broadcast whenever it is reasonably</td>
<td>CTAF</td>
<td>Broadcast—must include:</td>
</tr>
<tr>
<td>necessary to do so to avoid a collision, or the risk of a collision with</td>
<td></td>
<td>Location ‘traffic’</td>
</tr>
<tr>
<td>another aircraft in the vicinity of the aerodrome (see note 1)</td>
<td></td>
<td>Aircraft type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Callsign</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Position/intentions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Location</td>
</tr>
<tr>
<td>The pilot intends to depart from the aerodrome (see note 1)</td>
<td>CTAF</td>
<td>Broadcast—immediately before or during taxiing</td>
</tr>
<tr>
<td>The pilot intends to enter a runway (see note 1)</td>
<td>CTAF</td>
<td>Broadcast—immediately before entering a runway</td>
</tr>
<tr>
<td>The pilot is inbound</td>
<td>CTAF</td>
<td>Broadcast—10 nm from the aerodrome or earlier, commensurate with</td>
</tr>
<tr>
<td></td>
<td></td>
<td>aeroplane performance and pilot workload, with an estimated time of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>arrival (ETA) for the aerodrome</td>
</tr>
</tbody>
</table>
### Situation | FREQ to use | Remarks
--- | --- | ---
The pilot is ready to join the circuit | CTAF | Broadcast—immediately before joining the circuit
Pilot intends to make:  
• a straight-in approach or  
• a base leg join | CTAF | Broadcast:  
• on final approach at not less than 3 nm from the threshold (see note 2)  
• before joining on base
The pilot intends to fly through the vicinity of, but not land at, a non-controlled aerodrome | CTAF | Broadcast—when the aircraft enters the vicinity of the aerodrome (as defined) (see note 3)
Instrument approach when:  
• departing FAF or established on final approach segment inbound  
• terminating an approach, commencing a missed approach | CTAF | Broadcast

### Notes
1. Carriage of radio, and being qualified to use it, are mandatory at non-controlled aerodromes published in *ERSA* as certified, registered or military. However, CAR 166E allows, subject to compliance with specified procedures, for use of such aerodromes without a serviceable radio. See AIP ENR 1.1 and CAAP 166-01.
2. Some distances above refer to the runway threshold and others to the aerodrome reference point (ARP). Pilots should be aware that a GNSS indication of 3 nm from an aerodrome may not be 3 nm to the runway threshold.
3. An aircraft is in the vicinity of a non-controlled aerodrome if it is in airspace other than controlled airspace, within 10 nm of the aerodrome and at a height above the aerodrome that could result in conflict with operations at the aerodrome.
Non-controlled aerodromes

General

A non-controlled aerodrome is one where air traffic control is not operating. This can be either an aerodrome that is always in Class G airspace, an aerodrome with a control tower where no air traffic control service is currently operating, or an aerodrome that would normally have an ATC service but the service is temporarily unavailable (CAR 2 (non-controlled aerodrome), CAR 166 and CAAP 166).

Non-controlled aerodromes where the carriage of radios is required include all certified, registered and military aerodromes as published in ERSA. CASA may designate other aerodromes on a case-by-case basis, as published in ERSA or by NOTAM. CAR 243 details the requirements for pilots of aircraft fitted with a radio to maintain a listening watch at all times.

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

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

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

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

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

Note—If a radio is fitted to an aircraft, it must be servicable even though the carriage of a radio is not mandatory.
How to determine where radio carriage is required

Sample extract from ERSA aerodrome chart for Parkes and Noosa

<table>
<thead>
<tr>
<th>PARKES CODE 2137</th>
<th>ELEV 1069</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW</td>
<td>UTC +10</td>
</tr>
<tr>
<td>S 30 07.9</td>
<td>VAR 11 DEG E</td>
</tr>
<tr>
<td>E 148 14.3</td>
<td></td>
</tr>
<tr>
<td>AD OPR Parkes Shire Council, PO Box 337, Parkes, NSW</td>
<td></td>
</tr>
<tr>
<td>2670. Council Ph 02 6681 2303; FAX 6682 3846, FAX 6682 1710; ARO 0422 282 082.</td>
<td></td>
</tr>
<tr>
<td>REMARKS</td>
<td></td>
</tr>
<tr>
<td>2. This AD is a Security Controlled Airport.</td>
<td></td>
</tr>
<tr>
<td>3. Parkes Radio Telescope - Aircraft Exclusion Zone exists 1NM radius around and 5.000FT ceiling above the telescope. R528 is 12NM N of Parkes aerodrome.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOOSA</th>
<th>ELEV 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>QLD</td>
<td>UTC +10</td>
</tr>
<tr>
<td>S 26 26.4</td>
<td>VAR 11 DEG E</td>
</tr>
<tr>
<td>E 153 03.8</td>
<td></td>
</tr>
<tr>
<td>AD OPR Noosa Helicopters and Hanger Services Pty Ltd., PO Box 4, Noosaville, QLD, 4565, PH</td>
<td></td>
</tr>
<tr>
<td>07 5442 4451.</td>
<td></td>
</tr>
<tr>
<td>REMARKS</td>
<td></td>
</tr>
<tr>
<td>1. Restricted OPS, PVT, PPR from AD OPR.</td>
<td></td>
</tr>
<tr>
<td>2. AD Charges: All ACFT.</td>
<td></td>
</tr>
<tr>
<td>ATS COMMUNICATIONS FACILITIES</td>
<td></td>
</tr>
<tr>
<td>FIA</td>
<td>BRISBANE CENTRE</td>
</tr>
<tr>
<td>129.0 Circuit Area</td>
<td></td>
</tr>
<tr>
<td>CTAF</td>
<td>126.7</td>
</tr>
<tr>
<td>CHARTS RELATED TO THE AERODROME</td>
<td></td>
</tr>
<tr>
<td>WAC 3340</td>
<td></td>
</tr>
</tbody>
</table>

Radio carriage **mandatory** at all CERT, REG, MIL aerodromes

Radio carriage **not mandatory** at UNCR aerodromes unless required by the aerodrome operator or designated by CASA

See aforegoing section dealing with Operations – Class G communications

### Airmanship

**CAAP 166-01**

Pilots of radio-equipped aircraft are strongly recommended to use ‘standard’ aerodrome traffic circuit procedures and radio broadcasts at all non-controlled aerodromes.

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

Transponders can be detected by aircraft equipped with airborne collision avoidance system (ACAS) or traffic collision avoidance systems (TCAS), allowing them to ‘see’ other aircraft and take evasive action. Pilots of transponder-equipped aircraft should, at all times, ensure their transponder is switched to ON/ALT (Mode C), especially when operating in the vicinity of a non-controlled aerodrome. In the event of a radio failure, it is important to select and squawk (transmit) code 7600 in Mode C on their transponders.
So as not to impede commercial aviation, pilots flying recreational, sport or general aviation (GA) aircraft for their own leisure, should consider giving way to aircraft being used for commerce provided that the inconvenience to their own operation is not great and it can be done safely. Operators of commercial aircraft should never expect a give-way offer to be made. Any offer to give way must be explicit and its acceptance acknowledged (CAAP 166).

Pilots are reminded of their responsibility to see and avoid (CAR 163A); to maintain vigilance in looking out for other traffic. Pilots should not assume that no local air traffic exists if they do not receive any radio transmissions relating to the presence of other aircraft.

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

Where you and/or the other pilot(s):

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

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**Circuit procedures**

**AIP ENR 1.1**

**Standard circuit procedures**

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

If a secondary runway is being used, pilots using this secondary runway should avoid impeding the flow of traffic on the active runway.
Aerodromes that have right-hand circuits are listed in *ERSA*. Circuit information may also be published or provided by aerodrome operators in other sources of aeronautical information.

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

**Maximum speed**

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

**Circuit heights**

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

<table>
<thead>
<tr>
<th>Type of aircraft</th>
<th>Standard circuit speed</th>
<th>Standard circuit height</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High performance</strong></td>
<td>Above approximately 150 kt</td>
<td>1500 ft above aerodrome elevation</td>
</tr>
<tr>
<td>(includes jets and many turboprops)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Medium performance</strong></td>
<td>Between approximately 55 kt and 150 kt</td>
<td>1000 ft above aerodrome elevation</td>
</tr>
<tr>
<td>(includes most piston engine aircraft and gliders)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Low performance</strong></td>
<td>Approximately 55 kt maximum</td>
<td>500 ft above aerodrome elevation</td>
</tr>
<tr>
<td>(trikes and ultralight aircraft)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
During initial climb-out, the turn onto crosswind should be made at a height appropriate to the performance of the aircraft but, in any case, not less than 500 ft above terrain so as to be at circuit height when turning downwind.

Pilots may vary the size of the circuit depending on:

- the performance of the aircraft
- AFM/POH requirements
- company SOPs and/or
- other safety reasons.

**Final approach**

The turn onto final approach should be:

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

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

**Departing the circuit area**

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

Be aware of traffic joining the circuit by the recommended overfly procedure, especially if climbing to depart overhead the aerodrome (CAAP 166-01).

**Note**—Pilots of departing aircraft should be aware of traffic intending to join the circuit by the recommended overfly procedure as they can be 2000 ft or more above aerodrome elevation.
Arrivals, departures and transits

Procedures CAAP 166

Arrivals procedure

- Joining circuit on a downwind leg
- Joining at 45°
- Arriving at not less than 500ft above circuit height
- Joining circuit at (midfield) crosswind
- Descend to circuit height
- Arriving at not less than 500ft above circuit height
- Joining for straight-in approach not less than 3nm

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

Where a pilot is unfamiliar with the aerodrome layout, or when its serviceability, wind direction, wind speed, or circuit direction cannot be ascertained prior to arrival, use the overfly procedure. Overfly or circle the aerodrome at least 500 ft above the circuit altitude, which may be 2000 ft or more above the aerodrome elevation (as in the case shown above). When you have determined the circuit direction position the aircraft to a point well clear (normally the non-active side of the circuit) before descending to a circuit altitude that equates to the aircraft’s performance.

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

**Low-performance aircraft**—For low-performance ultralight aircraft and rotorcraft with a maximum speed of approximately 55 kt, it is recommended that the aircraft overfly midfield at 500 ft above aerodrome elevation. This will minimise the risk of conflict with higher or faster traffic.
Descent on the non-active side—When arriving and intending to join the circuit from overhead, descend on the non-active side of the circuit so that the aircraft is established at its circuit altitude as it crosses the runway centreline on crosswind, between midfield and the departure end of the runway.

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

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

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

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

**Suggested go-around manoeuvre**

Straight-in approaches—Straight-in approaches are not a recommended standard procedure; however, CAR 166B allows pilots to make straight-in approaches providing they meet certain conditions:

- 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
- on a straight-in approach, the pilot must give way to any other aircraft established and flying in the circuit pattern at the aerodrome (pilots on the base leg and before entering the final leg should be vigilant that no traffic is on long final for landing)
• before making a straight-in approach, pilots must determine the wind direction and speed and the runway in use at the aerodrome. There are several ways to do this:
  – automatic weather station (AWS), aerodrome weather information service (AWIS), automatic aerodrome information service (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.

• pilots must assure themselves, by other means, of the aerodrome’s serviceability and other hazards which are usually indicated by markings adjacent to the wind indicator

• on a straight-in approach, the aircraft must be established on final at not less than 3 nm from the landing runway’s threshold. Pilots should include their intention to conduct a straight-in approach with their inbound broadcast. Also make a further broadcast of intentions when not less than 3 nm from the runway threshold.

Pilots making a straight-in approach should observe the following:
• do 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 squawking (transmitting) in Mode C or ALT. The aircraft’s external lights 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 priority over an aircraft carrying out a straight-in approach.

Joining on base leg—Pilots should be mindful that the following types of incidents are more common when joining on the base leg:
• landing downwind in direct conflict with other traffic using the into-wind runway
• having to go around from late final due to other aircraft or vehicles on the runway
• landing on a closed runway or at a closed aerodrome.
Joining on the base leg is not a standard procedure. CASA recommends that 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 determined the
  - wind direction and speed
  - runway in use
  - circuit direction
  - presence of obstructions on the runway and
  - serviceability of the aerodrome and runway

- give way to other circuit traffic and ensure the aircraft can safely (no traffic conflict likely) join the base leg applicable to the circuit direction in use at the standard height and

- broadcast their intentions.

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

**Taxi after landing**—After landing, vacate the runway strip as soon as practicable. Aircraft should not stop until clear of the runway strip (AIP ENR 1.1).

**Transiting flights**—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. Be aware, however, that IFR approach procedures may commence at significant heights above the aerodrome (for example 4954 ft at Innisfail).

If you determine that you are flying at a height that is within the vicinity of an aerodrome that requires the carriage of radios, you must monitor and broadcast your position on the CTAF (CAR 166C).

**Further information**—VFR pilots can find information on IFR approach procedures on the Airservices Australia website at www.airservicesaustralia.com/aip/aip.asp
Call Airservices Service Desk for assistance on 1800 801 960.
Radio unserviceability

**Flight with an unserviceable radio** CAAP 166

At non-controlled aerodromes where the carriage of radio is required, continuation of a ‘no radio’ arrival or departure is permitted in certain circumstances (CAR 166E).

If a radio failure occurs either en route to, or in the circuit of, the aerodrome then you may continue to land at that aerodrome provided:

- the aircraft’s landing lights, anti-collision lights and transponder are turned on, if equipped and
- the pilot uses the overfly procedure for joining the traffic circuit on arrival.
  
  See Operations—Non-controlled aerodromes—Recommended circuit join.

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.

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 operations.

**Non radio-qualified pilot or non radio-equipped aircraft** CAAP 166

In exceptional circumstances, the regulations make 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-controlled certified, registered, military or designated aerodrome.

The non-radio aircraft must be operated:

- VMC by day and
- to arrive or depart under the escort of another aircraft that is radio-equipped and flown by a radio-qualified pilot. This will allow the escorting pilot to make radio calls on behalf of both aircraft. The radio-equipped aircraft should be manoeuvred to keep the non-radio aircraft at a safe distance (CAR 163) and in sight at all times in order to accurately report its position.
Night circuits

Circuits under night VFR are generally more demanding than daytime circuit operations and require increased pilot vigilance (CAAP 166).

Do not fly night circuits for training at a height less than 1000 ft above aerodrome elevation.

Further information
• CAO 29.2: Air Services Operations – Night Flying Training

Traffic mix

Traffic mix CAAP 166

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

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

General aviation pilots should be aware that, in certain circumstances, passenger transport aircraft may not be able to use the active runway. Passenger transport aircraft must operate under more stringent regulations, including specific aircraft performance regulations. For example, an aircraft may depart downwind, accepting an increased take-off distance because of a performance limitation imposed by terrain clearance requirements on the active runway. Similarly, landing into wind may not always be possible when relevant performance limitations are taken into account.
**Glider operations**—Can be conducted from normal runways associated with an aerodrome, or from adjacent sites within the confines of an aerodrome. Gliders can be launched using a variety of methods including aero tow, vehicle tow, self-propulsion and winch launch. In all cases, vehicles and people may be operating on, or in the vicinity of, the runways in use.

Where gliders are operating from the active runway, they may not be able to give way to other aircraft when landing.

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

Winch operations may occur at any aerodrome and launch gliders to 4000 ft AGL, although the typical height is between 1500 and 2000 ft AGL. Pilots should be aware of winch wires up to these levels, particularly when overflying the aerodrome, and check ERSA and the latest NOTAMs for current, specific operational information.

Gliders landing on the active runway may not be able to give way to other aircraft.

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

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

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

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

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

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

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

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

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

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

Ultralight operations—The term ‘ultralight’ applies to many small recreational aircraft including trikes, powered parachutes and other small fixed-wing aircraft that cruise at maximum speeds of about 55 kt. Pilots of these aircraft should conduct their standard circuit at 500 ft above aerodrome elevation.

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

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

- ultralight aircraft are difficult to see, particularly for faster, larger aircraft
- faster, larger aircraft create significant wake turbulence that can be extremely hazardous to ultralight aircraft
- faster, larger aircraft will not be able to slow to the speeds of an ultralight aircraft to follow the ultralight and
- faster, larger aircraft—before arriving in the circuit and when below 10,000 ft—can be operating at speeds up to 250 kt. Although aircraft should be operating at a maximum of 200 kt in the circuit, such an aircraft reporting at 20 nm from an aerodrome could be in the vicinity of the circuit within five minutes.
Ultralight pilots should consult the AIP, ERSA, relevant charts and the latest NOTAMs to obtain the most up-to-date information and procedures at their aerodrome. The VFRG website vfrg.casa.gov.au is also updated regularly.

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

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

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

The rules governing these operations include provisions for separation from RPT flights, as specified in CASRs 137.155 and 137.160.

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

Balloon pilots can operate only in the vicinity of a certified or registered aerodrome if they have completed the Australian Balloon Federation’s airfield operations check. They must broadcast their position and intentions on the CTAF.

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.
Hazards

CAAP 166

Aircraft size and performance—General aviation pilots should be aware that aerodromes with runways of 1400 m or more in length can accommodate jet or large turboprop aircraft operations. Runway lengths are published in ERSA.

For aerodromes with high-performance traffic in the circuit, the overfly height should be no lower than 2000 ft above aerodrome elevation.

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

Pilots must operate within the limitations prescribed in the aircraft flight manual (AFM), in accordance with CAR 138.

In accordance with CAR 92, pilots should consider the following hazards if planning to take off or land downwind:

- Wind strength just above ground level may be significantly higher than indicated by the windsock.
- Windshear (for take-off):
  - 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.
- Windshear (for landing):
  - higher groundspeed at touchdown; and
  - a longer landing distance required.

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

In calm conditions, wake turbulence may not dissipate for several minutes. Pilots should position their aircraft with sufficient spacing in the traffic circuit to avoid encountering wake turbulence.
On take-off, smaller aircraft will normally require increased separation time before departing behind a larger aircraft.

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

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

**Take-off and landing separation**

**Take-off**—When taking off behind another aircraft, pilots should adhere to the separation standards published in the AIP:

- wait until a departing aircraft has crossed the upwind end of the runway or has commenced a turn and
  - if the runway is longer than 1800 m, wait until the departing aircraft has become airborne and is at least 1800 m ahead; or
  - if both aircraft have a maximum take-off weight less than 2000 kg, wait until the departing aircraft has become airborne and is at least 600 m ahead.

**Landing**—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 preceding landing aircraft has vacated the runway.

Pilots should be vigilant when using another, non-active runway and ensure they do not create a hazard to aircraft 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.
Collision avoidance

Collision avoidance in the circuit

The most hazardous area for collisions is within a space bounded by a cylinder of airspace 5 nm in diameter and up to 3000 ft above aerodrome elevation. All pilots must maintain good situational awareness within this high-risk area.

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

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

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

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

CARs 161 and 162 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.


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

Maintaining separation in the vicinity of a non-controlled aerodrome

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

In these situations, it is possible for a pilot flying an instrument approach through cloud to become visual and suddenly encounter a VFR aircraft in the circuit. Diligent radio broadcasting and continuous visual scanning are essential to avoid an airprox.
VFR pilots, on hearing IFR pilots broadcasting their intention to make an instrument approach, are expected to respond promptly to establish situational awareness with the IFR aircraft. Information that would be useful to the IFR pilot includes aircraft type, position and flight intentions.

VFR pilots should remember their responsibility to remain clear of cloud and maintain in-flight visibility in accordance with the criteria for visual meteorological conditions (VMC), as described in AIP ENR 1.2 and the VFRG.

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

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

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**SARWATCH and SARTIME**

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**Cancellation of SARWATCH other than SARTIME** AIP ENR 1.1

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

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

SARWATCH may be cancelled in combination with a pilot report of changing to a CTAF, in the circuit area, or after landing.

ATS will acknowledge ‘Cancel SARWATCH’ reports with a read-back of the place of arrival, if appropriate, and the words ‘SARWATCH terminated’.
Cancellation of SARTIME

When operating on a SARTIME, the pilot must cancel SARTIME by the time nominated and, during the contact with ATS, include the words ‘Cancel SARTIME’. ATS will acknowledge ‘Cancel SARTIME’ reports with a read-back of the place of arrival, if appropriate, and the words ‘SARTIME cancelled’.

The preferred method to cancel SARTIME is via telephone to CENSAR on 1800 814 931. When no telephone facilities are available you can use ATS frequencies.

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

SARTIME for departure

When submitting flight notification, a pilot may nominate a SARTIME for departure for the initial departure aerodrome. Intermediate departure times can be nominated by telephone after landing, or as part of the arrival report associated with that aerodrome. Only one SARTIME can be current at any time.

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

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

An IFR departure report is not sufficient to cancel a SARTIME for departure. Pilots who have nominated a SARTIME for departure must use the phrase ‘Cancel SARTIME’ with the departure report.
Cruising level requirements

Prohibited, restricted and danger areas

Airspace reservation AIP ENR 1.4

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

- flights of special military significance requiring the use of controlled airspace, which would be subject to unacceptable restrictions if normal operations applied or
- civil flights requiring passage through military airspace when weather conditions or other factors make flight on the normal air route inadvisable, or impossible, and when other routes are unavailable, or the use of such routes would impose severe economic penalties on the operation of the aircraft.

There are two types of airspace reservations:

- fixed defined areas and
- ‘mobile’ (for example aerial refuelling, en-route formation flights).

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

In such airspace, RAAF ATC is responsible for providing separation for transiting civil or military aircraft from the areas reserved or restricted for current air defence operations.

Classification

Airspace in which a potential hazard to aircraft operations may exist, and all areas over which the operation of civil aircraft may be restricted are promulgated as follows:

- **Prohibited area**—Airspace within which the flight of aircraft is prohibited.
- **Restricted area**—Airspace within which the flight of aircraft is restricted in accordance with specified conditions.
- **Danger area**—Airspace within which activities dangerous to the flight of aircraft may occur at specified times.
These areas are promulgated in the AIP designated airspace handbook (DAH) and are shown on AIP aeronautical charts by boundaries outlined in red and containing the identification of the area as a letter and a number.

The letters allocated are:

<table>
<thead>
<tr>
<th>Letter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Prohibited area</td>
</tr>
<tr>
<td>R</td>
<td>Restricted area</td>
</tr>
<tr>
<td>D</td>
<td>Danger area</td>
</tr>
</tbody>
</table>

The number identifies the area.

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

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>YB</td>
<td>Brisbane</td>
</tr>
<tr>
<td>YM</td>
<td>Melbourne</td>
</tr>
</tbody>
</table>

Details are shown in ERSA or through NOTAMs.

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

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

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

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

**Flight within prohibited areas**

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

Flight within active restricted areas is subject to the conditions published in AIP (ERSA and DAH) and NOTAM. To obtain access to a restricted area or airspace pilots must request approval from the controlling authority (see ERS PRD). When an ATC service is available within that airspace, approval may be requested from ATC directly, in the same manner as a clearance request to enter CTA.

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

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

RA conditional status legend

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

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

RA3—Pilots must not flight plan through the restricted area and clearance will not be available. See Rules of the air—VFR navigation—Prohibited, restricted and danger areas for further details.

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

When compliance with an air traffic clearance requires flight:

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

the pilot in command may assume that ATC has obtained approval for the flight.

Flight within danger areas

Approval for flight within a danger area outside controlled airspace is not required. However, it is the responsibility of the pilot in command to be aware of any dangerous activity and take appropriate precautions.
Lanes of entry AIP ENR 1.4

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

When using these lanes, pilots must:

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

Cruising level AIP ENR 1.7

VFR flights must be flown at a cruising level appropriate to their magnetic track, according to the following diagram and the table of cruising levels

• when cruising level is 5000 ft or higher or
• when practicable, when cruising level is below 5000 ft (CAR 173).
VFR cruising levels (North of 80 degrees South)

<table>
<thead>
<tr>
<th>Magnetic tracks</th>
<th>From 000° through East to 179°</th>
<th>From 180° through West to 359°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cruising altitudes (Area QNH)</td>
<td>1500</td>
<td>7500</td>
</tr>
<tr>
<td>3500</td>
<td>9500</td>
<td>4500</td>
</tr>
<tr>
<td>5500</td>
<td>6500</td>
<td></td>
</tr>
<tr>
<td>Cruising flight levels (1013 hPa)</td>
<td>*115</td>
<td>195</td>
</tr>
<tr>
<td>135</td>
<td>215</td>
<td>145</td>
</tr>
<tr>
<td>155</td>
<td>235</td>
<td>165</td>
</tr>
<tr>
<td>175</td>
<td>245</td>
<td></td>
</tr>
</tbody>
</table>

Source: AIP ENR 1.7

Notes
* FL115 is not available for level flight when the area QNH is less than 997 hPa.
† FL125 is not available for level flight when the area QNH is less than 963 hPa.

VFR below 5000 ft in Class G airspace

Pilots should be aware that VFR aircraft outside controlled airspace may be operating at random levels below 5000 ft AMSL.

Gliders and balloons operating in controlled airspace will be assigned block levels.

Limited radio and no radio procedures

Authorisation may be given to Australian-registered aircraft to vary the requirements for the carriage of radio equipment as specified in radio communication and navigation requirements on set out in aforegoing section dealing with Operations—Non-controlled aerodromes—General—Airmanship. Authorisations are given by the relevant CASA regional office.

Limited radio or non-radio aircraft at or above 5000 ft

A non-radio aircraft operating in Class G airspace may, due to stress of weather, operate above 5000 ft to the minimum extent necessary for the safe conduct of the flight, provided:

- the aircraft cruises at a VFR level
- the cruise is conducted in VMC and
- as soon as is practicable, the aircraft descends in VMC to below 5000 ft to continue flight in VMC.

A pilot not able to comply with these requirements must proceed to the nearest suitable aerodrome and land.
A non-radio aircraft, other than a glider, may operate above 5000 ft within the confines of a published danger area which is promulgated specifically for non-radio operations, or identified as permitting non-radio operations. Gliders may be authorised to operate above FL200 and monitor an approved frequency other than the area VHF frequency. The area of operation will be advised by NOTAM.

**Limited radio or non-radio in CTA**

If total or partial failure of mandatory radio communications equipment occurs before flight commences and repair facilities are available, repairs must be made before the flight proceeds. Where repair facilities are not available, and flight to the nearest appropriate repair facility entails flight in controlled airspace, the flight may proceed providing that for flight in controlled airspace ATS is advised of the radio failure and a clearance for the flight is obtained from ATC.

For operations at non-controlled aerodromes refer to the non-controlled aerodrome section of this publication set out in aforegoing section dealing with Operations—Non-controlled aerodromes—General.

**Navigation position fixing**

The following requirements apply to flight under VFR (AIP ENR 1.1):

- During flight pilots must maintain a time reference accurate to within 30 seconds (ENR 1.1-40, 4.2.2.1)

- The pilot in command must navigate the aircraft by visual reference to the ground or water, or by using any of the methods specified in AIP ENR 1.1 (IFR navigation requirements) as an alternate means, except that the pilot in command must be able to navigate by visual reference to the ground or water when operating at or below 2000 ft above the ground or water

- When navigating by visual reference to the ground or water, the pilot in command must positively fix the aircraft’s position by visual reference to features shown on topographical charts at intervals not exceeding 30 minutes. When flying over the sea, visual reference features may include rocks and reefs and fixed man-made objects which are marked on suitable charts and are readily identifiable from the air

  **Note**—Flight above more than SCT cloud, over featureless land areas, or over the sea, may preclude visual position fixing at the required intervals and may therefore make visual navigation impracticable.
• When navigating by visual reference in controlled airspace the pilot must notify
ATC if the aircraft’s track diverges by more than 1 nm from the track approved
by ATC, or, if navigating by reference to radio navigation aids, by more than the
tolerances given on AIP ENR 1.1

• VFR flight on top of more than scattered cloud is available provided that
  – VMC can be maintained during the entire flight, (including climb, cruise and
descent)
  – the pilot in command can meet the visual position fixing or IFR navigation
requirements
  – the pilot in command is sure that current forecasts and observations (including
those available in flight) indicate that conditions in the area of, and during the
period of, the planned descent below the cloud layer will permit the descent to
be conducted in VMC, and
  – the position at which descent below cloud is planned to occur must be such
as to enable continuation of the flight to the destination and, if required, an
alternate aerodrome in VMC (see notes below)

• when navigating by reference to radio navigation aids or GNSS, the pilot
in command must obtain positive fixes at the intervals and by the methods
prescribed in AIP ENR 1.1

• the pilot in command of a VFR flight wishing to navigate by means of radio
navigation systems or any other means must indicate in the flight notification
only those radio navigation aids with which the aircraft is equipped and the pilot is
competent to use under CASR 61.385.

• VFR flights must not be conducted above FL200 unless:
  ○ the pilot in command or, if more than one pilot is required, each pilot:
    – is authorised under Part 61 to conduct a flight under the IFR in that airspace
      and
    – complies with the recent experience requirements set out in CASR Part 61,
      and
  ○ the aircraft is equipped for flight under the IFR and
  ○ the aircraft is engaged in an ‘IFR pick up’, ‘VFR climb/descent’ or ‘VFR on top’
procedure as published in AIP and
  ○ the aircraft remains in Class E airspace.
Notes

1. A pilot must not undertake a VFR flight on top of more than SCT cloud unless the aircraft is equipped with serviceable flight and navigation instruments as specified in CAO 20.18 Appendix IV.

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

Track keeping AIP ENR 1.1

Tolerances are applied to tracks to assess containment area for the purposes of ensuring navigational integrity, separation from other aircraft, terrain and obstacle clearance and avoidance of specified airspace. Although allowing for the errors inherent in the navigational systems used, these tolerances are based on the assumption that the pilot will maintain track as closely as possible.

The pilot in command must, at all times, take positive action to regain track as soon as a deviation from the correct track is recognised.

When using radio navigational aids as the primary means of navigation, the aircraft must be navigated by reference to the aid that provides the most precise track guidance, with which the aircraft is equipped and the pilot is qualified to use.

The order of precision is localiser, GNSS, VOR, then NDB.

Position fixing with NAVAIDs

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

- over an NDB
- over a VOR
- over a TACAN
- over a marker beacon
- over a DME site
- via the intersection of two or more position lines which intersect with angles of not less than 45° and which are obtained from NDBs, VORs, localisers or DMEs in any combination. or
- with reference to GNSS meeting the equipment requirements of AIP GEN 1.5.

Note—GNSS is not a positive fix for separation purposes.
### Controlled airspace

#### General

This section sets out pilot actions and related ATS activity in civil and military controlled airspace.

#### Airspace classification

- **Class C**: Controlled airspace at and below FL285, excluding airspace designated as Class D or Class E
- **Class D**: IFR and VFR flights are permitted and all flights are subject to ATC clearance
  - IFR flights are separated from other IFR flights
  - IFR flights receive a separation service in respect of other VFR flights
  - A separation service is a controlled condition whereby a separation standard need not be applied between IFR and VFR aircraft.
- **Class E**: IFR and VFR flights are permitted
  - IFR flights are subject to ATC clearance
  - IFR flights are separated from other IFR flights
  - IFR flights receive traffic information on known VFR flights as far as practicable
- **Class G**: IFR and VFR flights are permitted and receive flight information service if requested

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

**General AIP ENR 1.1**

Except in an emergency, a clearance is required for all flights in Classes A, C, and D airspace, restricted areas and for IFR flights in Class E airspace, except when operating in accordance with IFR pick-up procedures.

Clearance is not required for VFR flights in Class E airspace.

Special requirements apply to parachute jumping operations (ENR 5.5).

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

Where the airspace classification and flight rules require, an aircraft must not enter controlled airspace without a clearance (see page 3.78 for holding procedures). The pilot is responsible for obtaining a clearance and, once obtained, must not amend a planned route, deviate from the cleared track, or change level without obtaining ATC approval. When determining where the clearance request will be made, the pilot should consider:

- aircraft performance
- the possibility of frequency congestion if the airspace is known to be busy
- the possibility of changes to route and/or level and
- the possible delays that might be incurred when clearances have to be coordinated with adjacent ATC sectors.

**Completed deviations from cleared route**

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

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

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

When communication facilities permit, ATC will pass clearances direct.

The clearance authorises flight in the specified manner to the first point at which the flight leaves controlled airspace, or, if completely in controlled airspace, to the first landing point.

Clearance amendments

An air traffic clearance proposed by ATC does not relieve the pilot from complying with statutory requirements, nor from responsibility for the ultimate safety of the aircraft.

If considered necessary, a pilot should request a different clearance from that issued.

In an emergency, a pilot may act without a clearance and immediately advise ATC.

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

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

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

A control instruction issued after a clearance is obtained amends the appropriate item in the clearance. When there is any change in the clearance limit and/or route specified in the initial clearance, a completely new clearance will be issued.
Whenever a restriction or requirement has been imposed, and a further restriction/requirement is subsequently imposed, the subsequent instruction will cancel all previous restrictions/requirements unless:

- all restrictions/requirements are restated or
- the subsequent instruction is prefixed ‘Further requirement’.

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

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

- at a convenient time before entering the runway for take-off at an aerodrome where communication can readily be established before take-off or
- after take-off, if not available or obtainable before take-off, provided that the aircraft does not enter the control area until cleared.

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

Clearances provided to pilots may include a ‘clearance void time’. Where a void time is specified, the clearance is valid only if the flight enters controlled airspace in accordance with the clearance at or before that time.

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

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

AIP ENR 1.1

A pilot in command must request an airways clearance:

- on the clearance delivery frequency, preferably immediately before starting engines, otherwise as soon as possible thereafter or
- where a clearance delivery frequency is not available, before entering the departure runway and
- before entering controlled airspace.

Airways clearances normally contain the following items:

- aircraft identification
- destination, area of operation, position or clearance limit
- route of the flight
- assigned level
- SSR code and
- frequency requirements.

If an aircraft is cleared only to an intermediate point, and flight beyond that point will be in controlled airspace, a pilot in command must obtain a further clearance before proceeding beyond the intermediate clearance point.

When an aircraft leaves controlled airspace, a further clearance must be obtained for any subsequent flight in controlled airspace.

Separation in controlled airspace AIP ENR 1.4

In Class C airspace, ATC provides separation as follows:

- between IFR flights
- between IFR and VFR flights
- between IFR and special VFR flights and
- between special VFR flights when the visibility is less than VMC.
Additionally, in Class C and Class D airspace:

- appropriate runway separation is applied to all aircraft at controlled aerodromes and
- ATC provides VFR flights with traffic information on other VFR flights.

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

It is the responsibility of the pilot in command to see and avoid other aircraft (CAR 163A).

**Special provisions** AIP ENR 1.4

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

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

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

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

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

In some circumstances, a number of services may operate under a common callsign and can be on a common or separate frequency:

<table>
<thead>
<tr>
<th>Service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery</td>
<td>Used by the airways clearance delivery (ACD) service when established on a discrete frequency.</td>
</tr>
<tr>
<td>Ground</td>
<td>Used by surface movement control and apron service (if provided by ATC) when established on a discrete frequency. At some locations this service also provides the airways clearance delivery service on the same frequency.</td>
</tr>
</tbody>
</table>
| Tower     | The following services use this identification:  
  - aerodrome control  
  - aerodrome/approach control when combined. |
| Approach  | Used by approach control (APP) service when established on a discrete frequency or by departure control (DEP) when on the same frequency. |
| Departures| Used by departure control (DEP) service when established on a discrete frequency. |
| Centre    | Used for:  
  - Area control (ACC) service  
  - SIS and  
  - FIS. |

Source: AIP GEN 3.3 – 3

Traffic information in controlled airspace AIP GEN 3.3

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

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

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

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

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

**Aircraft deviations in controlled airspace – advice to ATC** AIP ENR 1.1

In controlled airspace, separation standards are based on the pilot maintaining track as closely as possible at all times. Corrective action must be taken to regain track as soon as any deviation is observed.

Additionally, the pilot must immediately notify ATC if the aircraft is found to be off track by any of the deviations described below:

<table>
<thead>
<tr>
<th>LLZ/VOR</th>
<th>Half-scale deflection or more of the CDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDB</td>
<td>±5° or more from the specified bearing</td>
</tr>
<tr>
<td>DME</td>
<td>± 2 nm or more from the required arc</td>
</tr>
<tr>
<td>RNAV</td>
<td>Half scale deflection of the CDI or IDEV as appropriate</td>
</tr>
<tr>
<td>GPS</td>
<td>If the indicated displacement from track centreline exceeds ±2 nm</td>
</tr>
<tr>
<td>VISUAL</td>
<td>More than 1 nm from the cleared track</td>
</tr>
</tbody>
</table>

The values above must not be interpreted as defining a sector within which the pilot is permitted to navigate.

**Deviations from route or track**

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

**Deviations due to weather**

In controlled airspace, any diversion from route or route or track due to weather requires prior clearance from ATC. If unable to obtain a clearance (for example, due to being out of radio contact) and the pilot in command considers that the deviation is necessary (see AIP ENR 2.2-3). A PAN call specifying details of the deviation must be broadcast on the appropriate frequencies.

‘Pan-Pan, Pan-Pan, Pan-Pan, Zulu Foxtrot Romeo, 15 nautical miles south of Normanton, 8500, is descending immediately to 500 feet to avoid cloud’.

Pilots must be aware that the declaration of an emergency does not guarantee the aircraft safe passage, especially if the deviation is into an active restricted area.
**Change of levels in controlled airspace** AIP ENR 1.7

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

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

The pilot in command of an aircraft operating in controlled airspace must report:

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

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

- the pilot in command of the lower aircraft must report approaching each assigned level in the sequence and
- the pilot in command of the higher aircraft, on hearing the lower aircraft report approaching each assigned level, must report the last vacated level.

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

- the phrase ‘STANDARD RATE’ when included in a clearance, specifies a rate of climb or descent of not less than 500 ft per minute, except that the last 1000 ft to an assigned level must be made at 500 ft per minute and
- in the case of a step-climb or descent, the specified rate will be applicable to all level clearances issued in the course of the step-climb or descent. If unable to comply with the prescribed rate, the pilot in command must advise ATC.
**Block levels** AIP ENR 1.7

Cruise climb is not used in Australian-administered airspace. Where possible, block level clearances will be issued upon request.

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

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

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

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**Engine start and taxi**

**Engine start** AIP ENR 1.1

The pilot in command of an aircraft must request approval to start engines when the requirement is notified by:

- ATIS
- NOTAM
- AIP Supplement
- ATC or
- **ERSA**.
**Taxi clearance** AIP ENR 1.1

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

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

The pilot in command must obtain a taxi clearance before moving on the manoeuvring area.

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

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

Pilots vacating a holding bay shall give way to aircraft on the taxiway.

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

An aircraft taxiing on the manoeuvring area must stop and hold at all lighted stop bars and may only proceed further when a clearance to enter or cross the runway has been received and the stop bar lights have been switched off.

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

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

Aircraft required to hold short of a runway must hold at the appropriate holding point for that runway, or the runway strip edge at the intersection of a crossing runway. A pilot wanting to use less than the full length of the runway available should nominate the intention when requesting the taxi clearance.
ATC may offer an intersection departure and will advise the remaining runway length if required.

A pilot in command unfamiliar with the aerodrome should ‘request detailed taxi instructions’.

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

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

**Provision of operational information** AIP ENR 1.1

ATC will supply the following information for take off:

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

**Nomination of runways** AIP ENR 1.1

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

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

Take-off

**Selection of take-off direction** AIP ENR 1.1

The pilot in command must ensure that the runway is suitable for the operation. If not suitable for an operational reason, ATC must be advised before taxiing or when requesting an airways clearance by using the phrase ‘**Require runway (number)**’.

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

**Selection of circuit direction**

Circuit directions and turns will be specified or authorised by ATC. A pilot in command must notify ATC if a particular turn or circuit is essential to the safe operation of the aircraft by use of the word ‘**Require**’.

**Departure instructions**

Departure instructions may contain the following as required:

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

*A pilot assigned a heading (including runway heading) must not compensate for wind effect.

When a heading is assigned as a departure instruction, the pilot in command must ensure that the heading and the direction of the turn are read back.
Change to tower frequency

Domestic aircraft should change to tower frequency:

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

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

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

Runway entry

A pilot in command must not enter an active runway unless a specific clearance to:

- take off
- line up or
- backtrack or
- cross

has been received, or a clearance to enter for other purposes has been received from ATC and the stop bar lights, where fitted, have been switched off.

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

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

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

Holding on the runway

The pilot in command must not hold on the runway in use unless permission to do so has been obtained from ATC.
Clearance required

A pilot in command must not take off unless the specific clearance ‘Cleared for take-off’ has been received.

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

Separation minima for take-off

An aircraft will not be permitted to commence take-off until:

- a preceding departing aircraft using the same runway has
  - crossed the upwind end of the runway
  - commenced a turn
  - if the runway is longer than 1800 m, become airborne and is at least 1800 m ahead of the following aircraft
  - if the preceding aircraft has an MTOW of 7000 kg or less and the following aircraft has an MTOW below 2000 kg and is slower, the preceding aircraft is airborne and is at least 600 m ahead of the following aircraft
  - if both aircraft have an MTOW below 2000 kg, the preceding aircraft is airborne and is at least 600 m ahead of the proposed point of lift off
- a preceding landing aircraft using the same runway has vacated it and is taxiing away from the runway and
- a preceding aircraft, using another runway, has crossed or stopped short of the take-off aircraft’s runway.

Note—Where reasonable to do so, ATC may issue a take-off clearance in anticipation that the prescribed separation will exist at the time that the take-off roll is commenced.

Other than as specified for LAHSO operations, exceptions to this application of separation standards are:

- aircraft taking off in formation with respect to each other
- aircraft operating in different areas or lanes on aerodromes with runways or facilities suitable for simultaneous take-offs (CAR168) and
- the avoidance of wake turbulence.
After take-off

Airborne report—Class C control zones AIP ENR 1.1

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

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

Departure report—certain Class D aerodromes

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

- tracking information and
- the last assigned altitude.

However, this report is not required:

- for VFR aircraft departing the control zone directly into Class G airspace or
- for aircraft that have been instructed to contact centre, approach or departures once airborne—in which case an airborne report will be made on the relevant frequency.

The departure time must be calculated as follows:

- current time minus an adjustment for the distance from the aerodrome or
- when over or abeam the aerodrome.

Frequency change

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

In all other situations, pilots of departing aircraft must remain on tower frequency until specific frequency change instructions are issued. Pilots can generally expect an instruction to contact departures control before reaching 2000 ft and should, when advised, effect the change as soon as possible.

When contacting area control, pilots must advise the last assigned level and, if not maintaining the assigned level, the level maintaining or last vacated level.
Note—The ‘last vacated level’ may be omitted by identified aircraft squawking pressure altitude—derived level information.

Establishment on track

Unless otherwise instructed by ATC, a pilot in command must remain within 5 nm of the departure aerodrome to establish flight on the departure track as soon as practicable after take-off.

Arrival

VFR flights entering Class C airspace AIP ENR 1.1

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

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

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

If landing at an ATIS-provided aerodrome, the pilot should obtain the ATIS before the first contact on the approach frequency. On first contact advise ATIS received.
The clearance to enter will specify the altitude, track and any holding instructions. Some of these items may be combined with the clearance ‘Cleared for visual approach’.

**Flights entering controlled airspace from Class G airspace** AIP ENR 1.1

When communications facilities exist and the controlled airspace and the non-controlled aerodrome are in close proximity, a clearance should be obtained direct on the ATC frequency. When this is not possible, clearances should be requested through the ATS unit providing services in Class G airspace.

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**Visual approach**

**ATC authorisation** AIP ENR 1.1

ATC may authorise a visual approach for a VFR flight by day and night when the aircraft is within 30 nm of the aerodrome.

**Tracking requirements**

Tracking requirements for a visual approach include the following:

- a pilot in command must maintain track/heading on the route progressively authorised by ATC until:
  - by day—within 5 nm of the aerodrome or
  - by night—for a VFR flight, within 3 nm of the aerodrome and the aerodrome is in sight and
- from this position the circuit must be joined as directed by ATC for an approach to the nominated runway.
Minimum altitude requirements

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

- by day—operate not below the lowest altitude permissible for VFR flight (CAR 157); and
- by night—maintain not less than the lowest altitude permissible for VFR flight (CAR 174B) until the aircraft is within 3 nm of the aerodrome and the aerodrome is in sight.

A pilot in command making a visual approach must not climb above an altitude reported to ATC as having been reached or left, unless authorised to do so.

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

Holding

Holding procedures in the vicinity of controlled airspace AIP ENR 1.5

Pilots instructed to hold by ATC must hold at the designated location until further cleared.

Option 1: Hold

Option 2: Descend below steps and again ask for clearance

Option 3: Fly around controlled airspace outside the boundaries

Option 4: Proceed to an alternative
ATC will normally assign aircraft estimated to arrive first over a holding fix, or first able to commence an approach, the lowest available level for assignment.

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

When operationally necessary, a pilot holding must advise ATC of the latest divert time.

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

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

Landing

**Landing—provision of operational information** AIP ENR 1.1

ATC will supply the following information for landing operations:

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

The pilot in command must ensure that the nominated runway or direction is operationally suitable. If the nominated runway or direction is not suitable, ATC must be advised using the phrase ‘Require runway (number)’. Such a request will not result in of loss of priority provided that it is made:

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

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

Selection of circuit direction

A pilot in command must notify ATC if a particular turn or circuit is essential to the safe operation of the aircraft. The word ‘require’ must be used to enable ATC to identify the safety requirement.

Unless otherwise instructed by ATC, the pilot of an arriving or circuit training aircraft must report ‘downwind’ when starting or entering the downwind leg of the traffic circuit. If frequency congestion prevents the call being made when starting the downwind leg, the pilot must report ‘mid-downwind’ or ‘late-downwind’ as appropriate.

Landing clearances

A pilot in command must not land unless they receive specific clearance ‘Cleared to land’.

Separation minima for landing

The appropriate wake turbulence separation standard will be applied by ATC between landing aircraft, except when a pilot has been assigned responsibility to maintain separation with another aircraft.

A landing aircraft will not be permitted to cross the threshold of the runway on its final approach until:

- a preceding departing aircraft using the same runway:
  - is airborne, and
  - 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;
– is at least 1,000 m from the runway threshold, and
  – has commenced the take-off run, and
  – in the opinion of the controller, no collision risk exists, and
  – the aircraft taking off has a MTOW of 7,000 kg or less, and
  – the landing aircraft is performance Category A and has a MTOW below 3,000 kg.
• a preceding landing aircraft using the same runway:
  – has vacated it and is taxiing away from the runway; or
  – has landed and has passed a point at least 1,000 m from the threshold of the runway and will vacate the runway without backtracking, and
  – in the opinion of the tower controller, no collision risk exists, and
  – the preceding landing aircraft has a MTOW of 7,000 kg or less, and
  – the following landing aircraft is performance Category A and has a MTOW below 3,000 kg; or
  – has landed and has passed a point at least 600 m from the threshold of the runway, is in motion and will vacate the runway without backtracking; and
  – the preceding landing aircraft has a MTOW of less than 7,000 kg, and
  – the following landing aircraft has a MTOW of 2,000 kg or less, or
  – in the case where the following landing aircraft is a helicopter, the preceding landing aircraft is at least 300 m down the runway from the threshold and ATC is satisfied that no collision risk exists.
• a preceding aircraft, using a different runway, has crossed or stopped short of the landing aircraft’s runway.

In the above situations, a landing clearance may be issued if ATC expect that the required runway separation standard will exist.

Exceptions to separation minima are:
• aircraft landing in formation with respect to each other; and
• aircraft operating in different areas or lanes on aerodromes with runways or facilities suitable for simultaneous landings.
**Separation minima for landing**

**Go-around procedure in VMC**

Except as specified in ERSA for specific aerodromes if an aircraft is required to go around from a visual approach in VMC, the aircraft must initially climb on the runway track, remain visual and await ATC instructions.

If the aircraft cannot clear obstacles on runway track, the aircraft may turn.

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

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

**Taxiing after landing**

A pilot in command must not hold on the runway in use unless ATC has so authorised.

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

- promptly vacate the runway without backtracking
- change from the aerodrome frequency to the SMC frequency (where established) when vacating the runway strip and obtain an ATC taxi instruction
- not cross any runway that intersects the taxi route unless in receipt of a taxi instruction and a ‘Cross runway (number)’ instruction from ATC
- taxi to the destination via the most direct taxiway(s) available, and
- where an apron service is provided on a discrete frequency (see ERSA), change to that frequency on entering the apron.
A taxi instruction which contains a taxi limit beyond a runway must include a ‘Cross runway (number)’ instruction to cross that runway. When an aircraft is required to hold short of a runway intersecting the taxi route, ATC will issue a taxi instruction limit of the holding point associated with the intersecting runway.

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

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

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

The taxi clearance regulates movement on the manoeuvring area.

The separation of aircraft taxiing on the manoeuvring area is a joint pilot and controller responsibility. Taxi clearance will contain concise instructions and adequate information so as to assist flight crew to follow the correct taxi routes, to avoid collision with other aircraft and objects, and to minimise the potential for the aircraft inadvertently entering a runway.

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

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

General

AIP ENR 1.1

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

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

An air traffic control service will be provided.

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

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

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

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

Class D airspace requirements

Map depiction

The lateral limits of Class D control area steps are depicted with blue lines and a blue tint. The vertical limits of Class D are shown with blue labels (AIP GEN 3.2). Control zones have defined dimensions, and associated control area steps, with an upper limit of 4500 ft (AIP ENR 1.4 (Class D)).
Radio requirements

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

Control area protection

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

Operating requirements for transponders

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

Traffic information in controlled airspace  AIP GEN 3.3

In controlled airspace, when a separation standard does not exist, ATC will provide traffic information to the aircraft concerned when, in the opinion of the air traffic controller, the information is warranted by the proximity of the aircraft.
The traffic information provided will contain as much information as is known and necessary to assist the pilot in identifying the other aircraft, for example:

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

**Separation**

In Class D airspace (AIP ENR 1.4):

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

**Speed limitations**

Aircraft operating in Class D airspace are not to exceed (AIP ENR 1.4):

- 200 kt at or below 2500 ft AAL within 4 nm of the primary Class D aerodrome and
- 250 kt when operating in other parts of Class D airspace.

**VMC**

<table>
<thead>
<tr>
<th>Type of aircraft</th>
<th>All aircraft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>Within Class D</td>
</tr>
<tr>
<td>Distance from cloud</td>
<td>Horizontal 600 m</td>
</tr>
<tr>
<td></td>
<td>Vertical 1000 ft above, 500 ft below</td>
</tr>
<tr>
<td>Additional conditions</td>
<td>ATC may permit operations in weather conditions that do not meet these criteria (special VFR)</td>
</tr>
</tbody>
</table>

Source: AIP ENR 1.2
Special VFR

When operating under a special VFR clearance, pilots are responsible for ensuring that (AIP ENR 1.2):

- the flight is clear of cloud
- the visibility is not less than
  - aeroplanes: 1600 m
  - helicopters: 800 m or
  - balloons: 100 m below 500 ft AGL and 3000 m at and above 500 ft AGL
- a helicopter is operated at such a speed that the pilot has adequate opportunity to observe any obstructions or other traffic in sufficient time to avoid a collision and
- the flight is in accordance with the low-flying requirements of CAR 157.

En route

All levels flown in Class D airspace must be assigned by ATC. Except when identified, position reports are required for all aircraft in Class D airspace (AIP ENR 1.1).

Aeronautical ground lights

Aeronautical ground lights may indicate visual lanes of entry at some Class D aerodromes. If present, these lights are identified on visual terminal charts (VTCs) (AIP ENR 4.4).

Lanes of entry

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

Automatic Terminal Information Service (ATIS)

If landing or taking off at an aerodrome where ATIS is provided, the pilot should obtain the ATIS before first contact on the tower frequency. On first contact, advise ATIS received, for example: ‘Received information echo’ (AIP ENR 1.1).
Before entering Class D airspace, the pilot in command of an aircraft must establish two-way radio communication with the tower on the frequency notified on the chart, in ERS, or AIP Supplement or NOTAM. Thereafter, the pilot must maintain those communications while in the Class D airspace.

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

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

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

**Initiating two-way communications**

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

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

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

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

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

Track deviations

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

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

Parallel runway operations

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

A pilot in command must not land unless the specific clearance ‘Cleared to land’ (or ‘Cleared touch and go’ or ‘Cleared for the [option]’) has been received (AIP ENR 1.1).

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

Go-around

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

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

Go-around procedure for parallel runways

After landing

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

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

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

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

**Taxiing aircraft holding short**

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

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

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

AIP ENR 1.1

Taxiing and manoeuvring

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

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

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

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

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

Change to tower frequency

Aircraft should change to tower frequency:

- in the holding bay or
- close to, or at, the holding point of the nominated runway, when ready for take-off.
At Class D aerodromes at which parallel runway operations are in progress, pilots must identify the departure runway when reporting ready. For example: ‘(Callsign) ready runway right’.

A pilot in command must not hold on the runway in use unless ATC has authorised it.

**Departure report**

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

- track information and
- the last assigned altitude.

However, this report is not required:

- for VFR aircraft departing the control zone directly into Class G airspace or
- for aircraft that have been instructed to contact Centre, Approach or Departures once airborne—in which case an airborne report will be made on the relevant frequency.

**Summary of reports – all aircraft in Class D airspace**

<table>
<thead>
<tr>
<th>Situation</th>
<th>Frequency to use</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ready to taxi</td>
<td>ATC</td>
<td>Report</td>
</tr>
<tr>
<td>IFR departure in Class D CTR</td>
<td>ATC</td>
<td>Report</td>
</tr>
<tr>
<td>VFR departure in Class D airspace, unless departing CTR directly into Class G airspace</td>
<td>ATC</td>
<td>Report</td>
</tr>
<tr>
<td>Position report at prescribed points</td>
<td>ATC</td>
<td>Report (if cancelling SARWATCH)</td>
</tr>
<tr>
<td>Arrival</td>
<td>ATC</td>
<td></td>
</tr>
</tbody>
</table>

Source: AIP ENR 1.1

Pilots of VFR flights wanting to operate in other than Class D airspace, and who want to nominate a SARTIME, may submit details in the NAIPS SARTIME flight notification format (via the internet). If submitting the flight notification by fax or via telephone, fill out the Australian domestic flight notification form (AIP ENR 1.10).
Class E and Class G airspace

VFR in Class E airspace

AIP ENR 1.1

Class E airspace services

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

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

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

VFR flights in Class E airspace

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

- avoid published IFR routes, where possible
- monitor the appropriate Class E frequency and announce if in potential conflict
- take appropriate action to avoid potential conflict and
- avoid IFR holding patterns.
Surveillance information service in Class E and Class G airspace

AIP GEN 3.3

**Summary of surveillance information service (SIS)**

SIS services available include:
- alerting service for all flights receiving SIS
- flight following upon request and
- priority assistance when pilot prefixes requests with ‘Mayday’ (three times) or ‘Pan-Pan’ (three times).

**Note**—Many factors, such as limitations of radar, ADS-B and other surveillance equipment, volume of traffic, ATC workload and frequency congestion may prevent ATC from providing a surveillance service. The reason for not providing or continuing to provide the service in a particular case is not subject to question, nor need it be communicated to the pilot.

**General**

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

Pilots wanting to receive an SIS must be in direct VHF communications with ATC and equipped with a serviceable SSR transponder or ADS-B transmitter.

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

**Note**—All information is advisory in nature, and the pilot remains responsible for the safe operation of the aircraft. Terrain clearance, aircraft-to-aircraft separation, and obtaining clearances into controlled airspace remain pilot responsibilities.

Pilots of VFR flights receiving an SIS will be provided with information about ATS surveillance system-observed traffic. However, due to the nature and type of ATS surveillance system coverage, not all aircraft will be detected, and not all aircraft are equipped with an SSR transponder or ADS-B transmitter. Consequently, traffic information provided by ATC may be incomplete. Pilots must comply with the see-and-avoid requirements of CAR 163A.

ATC will provide an alerting service for flights receiving an SIS.
On initial contact with ATC, the pilot must advise the ATS surveillance service required and, if an ongoing service is requested, include the phrase ‘Request flight following’.

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

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

If ATC is unable to provide an SIS, the pilot will be advised ‘Surveillance service not available’. Requests for emergency assistance should be prefixed by ‘Mayday’ (three times) or ‘Pan-Pan’ (three times), and will receive priority.

If, following a request for an SIS, a request for flight following is not made and the requested information has been provided to the pilot, ATC will advise ‘Identification terminated’ to indicate that the surveillance service is terminated.

Note—When ATS surveillance services to VFR flights are terminated, pilots should monitor the ATS frequency appropriate to their area of operation.

If the pilot has requested flight following, the SIS will be provided on an ongoing basis, generally limited to within the controller’s area of responsibility. However, the SIS may be terminated at any time by the controller, or by pilot advice.

While receiving an SIS, the pilot must:

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

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

**Alerting service**

An alerting service will be provided:

- for all aircraft provided with ATC service
- in so far as practicable, to all other aircraft that have filed a flight plan or are otherwise known to the air traffic services and
- to any aircraft known or believed to be the subject of unlawful interference.
Sport and recreational aviation

Gliding operations

AIP ENR 5.5

General

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

Gliding operations in progress ground signal

Where aero-towing is in progress, pilots should remain well clear of gliders under tow. If wire launching is used, pilots should establish the locations of either the winch or tow car and the cable, and remain well clear. Over-flying the active runway below 2000 ft AGL is not advised, nor is landing without first ascertaining that the cable is on the ground and not across the landing path. Aero-tow and winch launching are possible up to 4000 ft AGL, but launches to 1500 ft or 2000 ft AGL are normal.

Except for operations in controlled airspace, gliding operations may be conducted no-radio, or may be on frequencies 122.5 MHz, 122.7 MHz or 122.9 MHz, which have been allocated for use by gliders. Unless otherwise authorised, gliding operations in controlled airspace (including Class E) must be conducted using the appropriate ATC frequency. Radio-equipped gliders at non-controlled aerodromes will use the CTAF. Except where the use of a gliding frequency is operationally necessary, it is recommended that gliders operating above 5000 ft outside controlled airspace (Class G) monitor the Area VHF frequency.
Gliding operations at registered/certified aerodromes

Gliding operations at registered/certified aerodromes may be carried out on:

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

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

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

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

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

At the locations where parallel runways exist and contra-circuit procedures apply, operations on the two parallel runways by aircraft below 5700 kg MTOW may be conducted independently in VMC by day. Aircraft must not operate within the opposing circuit area below 1500 ft AGL. Pilots should ascertain the runway direction in use as early as possible and conform to that circuit. A crossing runway should only be used when operationally necessary, and traffic using the crossing runway should avoid conflicting with the established circuit, for example, by using a long final, or not turning after take-off until well clear.

At aerodromes without prescribed contra-circuits, gliders must generally conform to the established circuit direction. However, unforeseen circumstances may occasionally compel a glider to execute a non-standard pattern, including use of the opposite circuit direction in extreme cases.
At non-controlled aerodromes a listening watch on the appropriate frequency is maintained during aero-tow launching by the tug pilot, and during wire launching by the winch or tow-vehicle driver. The tug pilot or winch/car driver may be able to advise glider traffic information to inbound or taxiing aircraft.

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

Gilders are not permitted to perform aerobatics, including spin training below 2000 ft AGL, within 2 nm of a registered or certified aerodrome. Gliders must not perform continuous 360° turns nor use thermal lift on the live side of a common circuit area (including the circuit area being used by known traffic on a crossing runway) unless they monitor the CTAF and give way to maintain adequate separation from other traffic in the circuit area.

Parachuting operations

AIP ENR 5.5

General

The pilot in command of an aircraft engaged in parachuting operations must take all reasonable measures to ensure that parachutists exit the aircraft only if:

- there is no risk of any part of the aircraft being fouled by parachutists or their equipment when they exit
- the operation does not impose adverse stress on any part of the aircraft structure
- the descent is able to be made in meteorological conditions where the target is clearly visible and the parachutist does not enter cloud, unless CASA specifies otherwise in writing and
- loose objects that, if dropped, could create a hazard to people or property on the ground or the water, are not carried by parachutists when exiting the aircraft.

Note—Parachutists are jointly responsible for ensuring that meteorological conditions allowing the visibility mentioned above are satisfactory.

The pilot in command must take all reasonable measures to ensure that parachutists exit the aircraft so as to reach the intended target.
A broadcast advising the intention to drop parachutists must be made from the drop aircraft not less than two minutes prior to parachutists exiting the aircraft. This requirement applies to all relevant frequencies for airspace through which the parachutists may descend, including:

- the appropriate ATC frequency or frequencies, depending upon the airspace type(s) descended through
- if the parachutists descend from controlled airspace into Class G airspace, a broadcast must be made on each specified frequency and
- where the landing area is located in the vicinity of a non-controlled aerodrome, the appropriate VHF frequency as described in ENR 1.1 subsection 10.1.

A broadcast made in accordance with the above paragraph must give notice that parachutists intend to exit the aircraft at the location specified in the broadcast, the position of the drop zone, exit altitude and the number of parachute canopies to be dropped.

The pilot in command must not allow parachutists to exit the aircraft unless they have made a broadcast in accordance with the two previous paragraphs.

**Conflicting traffic**

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

The pilot in command must not allow parachutists to exit the aircraft if they are notified, or become aware, that there is conflicting traffic in the airspace in which the descents will be conducted.

The pilot in command must not allow parachutists to exit the aircraft in Class E airspace until in receipt of traffic information from ATC.

**Additional requirements in controlled airspace**

The pilot in command must not allow parachutists to exit the aircraft when the parachutists will transit restricted area(s) or Class A, C, or D airspace until in receipt of an ATC clearance.

An aircraft engaged in parachuting operations must not engage in an operation in which parachutists exit the aircraft in controlled airspace and leave, transit or enter controlled airspace during their descent, unless the aircraft is equipped with two VHF radio transceivers to communicate with ATC and to monitor and advise air traffic outside the controlled airspace.
ATC base separation on the assumption that the parachutists will be dropped within one nm of the target. If an extension of this area is necessary, the pilot must advise ATC of the direction and distance required.

For parachutists who have been cleared to transit restricted area(s) or Class A, C and D airspace, pilots must advise ATC when all parachutists are on the ground. Primary communication should be by radio; however, if this is not possible, detail alternative arrangements in letters of agreement between local operators and the ATC unit(s) concerned.

Additional requirements at non-controlled aerodromes where radio carriage is required

An aircraft engaged in parachute operations must not engage in an operation involving parachute descents in the vicinity of an aerodrome where radio carriage is required, unless it is equipped with two VHF transceivers to monitor and advise air traffic in the vicinity of the aerodrome, and in the surrounding area.

In addition to the required broadcasts (mentioned in the above paragraphs), the pilot in command must make a broadcast not less than four minutes before the descents occur to give notice that parachutists intend to exit the aircraft at the location specified in the broadcast. This broadcast must be on the CTAF and appropriate ATC frequencies.

The pilot in command must not allow parachutists to exit the aircraft in the vicinity of an aerodrome where radio carriage is required within the 15 minutes before the estimated time of arrival of an RPT aircraft at an aerodrome unless:

- the two aircraft are in direct radio communication with each other and
- all parachutists can exit the aircraft and land before the RPT aircraft arrives within the circling area of the aerodrome.

After an RPT aircraft arrives at an aerodrome where carriage of radio is required, the pilot in command of an aircraft engaged in parachuting operations at that aerodrome must not allow parachutists to exit the aircraft until the RPT aircraft has landed and taxied clear of the runway.

After an RPT aircraft has broadcast that it is taxiing for departure from an aerodrome where carriage of radio is required, the pilot in command of an aircraft engaged in parachuting operations must not allow parachutists to exit the aircraft until the RPT aircraft is clear of the circling area of the aerodrome.
Additional requirements at certified and registered aerodromes

The pilot in command of an aircraft engaging in parachuting operations must not engage in an operation involving parachute descents at a certified or registered aerodrome unless:

- the aerodrome operator has approved parachute descents at the aerodrome
- regular and local users of the aerodrome have been notified of the intended descents
- the target for parachutists is separated from the movement area by a distance equal to the applicable minimum drop zone radius for the parachutists using it and
- the descents do not conflict with any aircraft that are
  - on the live side of any circuit known to be in use, or that could reasonably expect to be used by known traffic in prevailing conditions or
  - using any runway, taxiway or apron.

The above does not apply to an operation involving parachute descents at a certified or registered aerodrome to the extent that written specifications issued under CAR 152 require or allow the descents to be conducted differently.

The pilot in command must not allow parachutists to conduct descents at a certified or registered aerodrome if the pilot in command of another aircraft:

- is carrying out an instrument approach procedure at the aerodrome or
- is expected to commence an instrument approach procedure within five minutes.

Additional requirements for operations above 10,000 ft AMSL

A flight crew member who is on flight deck duty in an unpressurised aircraft engaged in parachuting operations must be provided with, and continuously use, supplemental oxygen:

- if the aircraft operates above FL120 or
- if the aircraft operates above 10,000 ft AMSL
  - for more than 15 minutes during a sortie
  - at night or
  - in IMC.
Balloon Operations

Types of operation

Balloons are permitted to operate in private, aerial work and charter operations. Aerial work and charter operations are flown under an Air Operator Certificate (AOC)—the pilot in command holds a commercial pilot (balloon) licence and is responsible to a chief pilot in accordance with CAO 82.7. Private operations are conducted by pilots who hold an Australian Ballooning Federation Inc issued certificate.

Unless authorised by CASA, pilots of balloons engaged in private operations must not operate:

- in controlled airspace
- below 2000 ft above aerodrome level within 3 nm of a registered or certified aerodrome, or
- below 1000 ft above ground level over a populous area.

Permission to fly in these areas—either for a specified event or for suitably qualified pilots—may be sought from CASA offices. When permissions are issued, they usually contain directions to operate in the same manner as balloons in aerial work or charter operations.

Pilots of balloons engaged in aerial work or charter operations can:

- operate within controlled airspace subject to an ATC clearance
- operate from certified or registered aerodromes and
- take off from, and land at, adequate open spaces within populous areas. When doing this, they must ensure that the balloon reaches the minimum overflight of 1000 ft AGL within a reasonable time following take-off, and minimise the time spent flying at low level whilst approaching to land in or within 300 m of a populous area.

Except where overflying a populous area, balloon pilots do not have to observe a minimum height. However, this does not absolve pilots from any responsibility with respect to landholders, stock or property. The Australian Ballooning Federation Inc maintains a register of sensitive areas where landholders have requested that pilots either do not land, or alternatively, observe a minimum over flight height.
Carriage and use of radio

Pilots of balloons engaged in aerial work or charter operations are required to carry and use VHF radio for communication, as necessary, with other aircraft and with ATS. However, the operators are authorised to maintain their own SARWATCH, and no flight notification is required for flights outside controlled airspace.

Pilots of balloons who have been permitted to operate in controlled airspace and below 2000 ft AAL within 3 nm of a registered or certified aerodrome must carry and use radio as described in the paragraph above. Where a number of balloons are permitted to operate together in the vicinity of a non-controlled aerodrome at which the carriage and use of radio is mandatory, one balloon in each group may maintain radio communication for the group.

Pilots of balloons engaged in private operations must carry radio and use it in accordance with the procedures described in AIP ENR 1.1 section 6 while they are operating:

- within the vicinity of a non-controlled aerodrome where radio carriage and use is required
- at or above 5000 ft above mean sea level
- within 10 nm of an aerodrome with a published instrument approach procedure or
- at night.

The holder of a private pilot certificate issued by the Australian Ballooning Federation Inc may have that certificate endorsed to permit radio communication on VHF frequencies only, without being the holder of a flight radiotelephone operator’s licence.

Operations in the vicinity of aerodromes

Within 3 nm of an aerodrome, the pilot in command of a balloon must give way to other traffic operating in the traffic pattern of the aerodrome which is applicable to the runway in use at the time.

The pilot in command of a balloon who intends to overfly an aerodrome within 3 nm should do so at a height greater than 1500 ft above the aerodrome. In the case of a private balloon flight which is not specifically authorised by CASA, over-flight must be conducted more than 2000 ft above the aerodrome.

The pilot of a balloon which is taking off within 3 nm of an aerodrome must give way to aircraft which are landing or on final approach to land, by delaying their take-off or, if airborne, by climbing or descending to remain clear of the other aircraft’s flight path.
Meteorological conditions for balloons

AIP ENR 1.2 prescribes VMC for balloons. Operations in other than prescribed VMC are not permitted.

Night balloon operations

Aerial work and charter operations by pilots who hold a NVFR (balloon) rating, and private operations with specific permission from CASA, may be conducted at night. In the case of aerial work and charter operations, these are restricted to the period of one hour before first light.

Operations in controlled airspace

Before a proposed flight in controlled airspace, a balloon operator or pilot in command must liaise with ATS as follows:

- contact ATC by telephone or radio before inflating the balloon to advise the planned launch site and likely direction or area of flight, and ascertain the availability of an ATC clearance and
- call to obtain a clearance before becoming airborne.

The pilot must maintain a continuous listening watch on the appropriate frequency during flight within controlled airspace, and report flight progress as ATC requires. The pilot must report changes in the direction of drift, which will cause the balloon to diverge from its nominated track or area of operations, as soon as possible, and, in any case, before the track error exceeds 1 nm.

For operations in an area of controlled airspace within radar coverage, a serviceable SSR transponder must be carried, unless ATC has advised otherwise.

In the event of a radio failure or other emergency, the relevant procedures as listed in the AIP, see section of the VFRG on Emergency procedures—Communication failure—Procedures.

Particular attention should be given to notifying the termination of a flight where radio contact is not available.

For more information: www.casa.gov.au/sportaviation
AIP ENR 1.12

Procedures for aircraft operating in an air defence identification zone (ADIZ)

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

An ADIZ is airspace of defined dimensions within which identification of all aircraft is required. When a flight is intended to operate within an ADIZ, the pilot must:

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

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

- a flight originating within an ADIZ which maintains a steady outbound track
- a flight which remains within 10 nm of the point of departure
- aircraft performing published approach, holding or recovery procedures and
- a flight conducted in accordance with special procedures arranged with the Regional Air Defence Commander.
Where flight plans have to be lodged, they must include details of:

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

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

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

<table>
<thead>
<tr>
<th>Estimated time of commencing the ADIZ route segments</th>
<th>± 5 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over land area</td>
<td>±10 nm from track</td>
</tr>
<tr>
<td>Over oceanic areas</td>
<td>± 20 nm from track</td>
</tr>
</tbody>
</table>

**Note**—The five minute limit will be used in considering interception action (see below), but pilots must report predicted deviations of greater than two minutes.

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

**Special requirements**

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

**Non-compliance**

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

**Interception**

Aircraft that are not exempted, and which cannot be satisfactorily identified, may be intercepted by fighter aircraft.

If any doubt arises as to the friendly intention of an aircraft, closer identification may be necessary, in which case the identifying aircraft will maintain visual observation of the intercepted aircraft, and:
• the intercepting aircraft should approach the intercepted aircraft from astern. The intercepting aircraft should normally take up a position on the left side, slightly above and ahead of the intercepted aircraft, within the field of view of the pilot of the intercepted aircraft, and initially not closer than 300 m.

• the intercepting aircraft should begin closing in gently on the intercepted aircraft, at the same level, until no closer than absolutely necessary to obtain the information needed and

• if identified as friendly, make the appropriate signal to proceed from a position slightly ahead, by a climbing turn of 90° to port away from the intercepted aircraft, if permissible, considering other air traffic.

The visual signal recommended for use to attract the attention of the pilot in command of the intercepted aircraft is shown in the following table. If repeated attempts to attract attention by use of this signal are unsuccessful, other methods of signalling may be used, including (as a last resort) the visual effect of the reheat/afterburner, providing that no hazard, including hazardous effects of wake turbulence, is created for the intercepted aircraft.

During daytime, the use of smoke-producing devices may have the desired effect. During daytime as well as at night, the use of high-powered strobe lights, whenever installed on the intercepting aircraft for collision avoidance purposes, would also be of assistance.

As a very last resort, and if directed carefully, the use of reheat/afterburner may achieve the desired result. This method is clearly most effective at night but can be both disturbing and noisy for the intercepted aircraft, especially if used within 300 m. Reheat/afterburner must therefore be used with great caution.

Aircraft identified by intercept as:

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friendly</td>
<td>should then proceed according to flight plan and/or ATC instructions</td>
</tr>
<tr>
<td>Unknown</td>
<td>should be prepared to be shadowed, diverted or instructed to land at a suitable airfield</td>
</tr>
<tr>
<td>Hostile</td>
<td>aircraft positively identified as ‘hostile’ may be engaged and destroyed</td>
</tr>
</tbody>
</table>

**Action by intercepted aircraft**

An aircraft which is intercepted by another aircraft must immediately:

• follow the instructions given by the intercepting aircraft, interpreting and responding to visual signals in accordance with the following table;

• notify, if possible, the appropriate ATS unit
• attempt to establish radio communication with the intercepting aircraft, or with the appropriate intercept control unit, by making a general call on the emergency VHF frequency 121.5 MHz and repeating this call on the emergency UHF frequency 243.0 MHz, if practicable, giving the identity and position of the aircraft and nature of the flight

• if equipped with SSR transponder, select code 7700, unless otherwise instructed by the appropriate ATS unit and

• if equipped with ADS-B or ADS-C, select the appropriate emergency functionality, if available, unless otherwise instructed by the appropriate ATS unit.

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

**Diversion of aircraft for defence operations**

The area air defence commander may, through ATS, direct the flight of aircraft in the interests of national security. Messages initiating such requirements will be prefaced by ‘Military operations require…’.

**Radio communications during interception**

<table>
<thead>
<tr>
<th>Phrase</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Callsign¹</td>
<td>What is your callsign?</td>
</tr>
<tr>
<td>Follow</td>
<td>Follow me</td>
</tr>
<tr>
<td>Descend</td>
<td>Descend for landing</td>
</tr>
<tr>
<td>You land</td>
<td>Land at this aerodrome</td>
</tr>
<tr>
<td>Proceed</td>
<td>You may proceed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phrase</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Callsign (callsign)¹</td>
<td>My callsign is (callsign)</td>
</tr>
<tr>
<td>Wilco</td>
<td>Understood, will comply</td>
</tr>
<tr>
<td>Cannot</td>
<td>Unable to comply</td>
</tr>
<tr>
<td>Repeat</td>
<td>Repeat your instruction</td>
</tr>
<tr>
<td>Am lost</td>
<td>Position unknown</td>
</tr>
<tr>
<td>May day</td>
<td>I am in distress</td>
</tr>
<tr>
<td>Hijack²</td>
<td>I have been hijacked</td>
</tr>
<tr>
<td>Land</td>
<td>I request to land</td>
</tr>
<tr>
<td>Descend</td>
<td>I require descent</td>
</tr>
</tbody>
</table>

**Notes**

1. The callsign required to be given is that used in radiotelephony communications with ATS units and corresponding to the aircraft identification in the flight notification. See ENR 1.12-2

2. Circumstances may not always permit, (nor make desirable), the use of the phrase ‘Hijack’.
### Visual signals

#### Visual signals for use in the event of interception

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

<table>
<thead>
<tr>
<th>Series</th>
<th>Intercepting aircraft signals</th>
<th>Meaning</th>
<th>Intercepted aircraft response</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td><strong>Day or night</strong>—Raising landing gear (if fitted) and flashing landing lights while passing over runway in use or helicopter landing area at a height exceeding 300 m (1000 ft) but not exceeding 600 m (2000 ft) [or, in the case of a helicopter, at a height exceeding 50 m (170 ft) but not exceeding 100 m (330 ft)] above the aerodrome level, and continuing to circle runway in use or helicopter landing area. If unable to flash landing lights, flash any other lights available.</td>
<td>The aerodrome you have designated is inadequate</td>
<td><strong>Day or night</strong>—If it is desired that the intercepted aircraft follow the intercepting aircraft to an alternate aerodrome, the intercepting aircraft raises its landing gear (if fitted) and uses the Series 1 signals prescribed for intercepting aircraft.</td>
<td>Understood, follow me</td>
</tr>
<tr>
<td>5</td>
<td><strong>Day or night</strong>—Regular switching on and off of all available lights but in such a manner as to be distinct from flashing lights.</td>
<td>Cannot comply</td>
<td><strong>Day or night</strong>—Use Series 2 signals prescribed for intercepting aircraft.</td>
<td>Understood</td>
</tr>
<tr>
<td>6</td>
<td><strong>Day or night</strong>—Irregular flashing of all available lights.</td>
<td>In distress</td>
<td><strong>Day or night</strong>—Use Series 2 signals prescribed for intercepting aircraft.</td>
<td>Understood</td>
</tr>
</tbody>
</table>

### Notes

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

2. These signals are applicable to aircraft both within and outside an ADIZ.

3. If radio communication is established during interception, but communication in a common language is not possible, attempts must be made to convey instructions, acknowledge instructions and essential information by using the phrases shown in Radio communications during interception, and by transmitting each phrase twice.
Night VFR

Checklist

To fly in command

1. In the last 6 months:
   - Completed one take-off and landing? [Yes/No]

2. In the last 24 months:
   - Completed a flight review, test or proficiency check for a NVFR rating or endorsement? [Yes/No]

3. In the last 90 days, to carry passengers:
   - (a) Completed three take-offs and landings dual or solo; or
   - (b) Completed a flight test or a relevant check, review for a NVFR rating, endorsement, or a flight including night operations as appropriate? [Yes/No]

LSALT

4. Published LSALT? [No/Yes]

   Calculate LSALT by:
   - (a) 10 nm either side of track
   - (a) Inaccurate navigation or NAVAID failure
     ±5 nm radius plus ±20% air distance travelled from last fix
   - (b) From AID
     ±10.3° to a max of 50 nm either side of track plus ±5 nm
   - (c) DR: ±15° to a max of 50 nm either side of track plus ±5 nm

Weather and NOTAMs

5. Pilot briefing from NAIPS obtained? [No/Yes]

6. ARFOR indicates:
   - Cloud > SCT below LSALT plus 1000 ft? [Yes/No]

   Note methods of determining cloud amounts (AIP ENR 1.1)

   Go to 7

   Due to inability to maintain VMC

   Enjoy your flight!
Operations – Night VFR – Checklist

7. **TAF indicating the presence, PROB30 or PROB40 of:**
   - (a) Cloud > SCT below 1500 ft
   - (b) Visibility < 8 km
   - (c) Crosswind > max for aircraft?

8. **NAVAID:**
   - Aerodrome served by NAVAID + aircraft equipped with NAVAID?

9. **Lighting:**
   - (a) PAL system + standby power supply + responsible person
   - (b) Portable with responsible person?

Aircraft equipment

10. **Aircraft instruments:**
    - (a) ASI;
    - (b) ALT;
    - (c) Compass;
    - (d) Clock;
    - (e) AI;
    - (f) DG;
    - (g) Turn and slip;
    - (h) Suction gauge?

11. **Aircraft lighting:**
    - (a) Instrument lights with variable illumination
    - (b) one landing light for private, two landing lights for commercial

12. **Aircraft radio equipment:**
    - (a) 1 x VHF radio
    - (b) 1 x NAVAID (NDB, VOR or certified GNSS)
    - (c) SSR transponder if operating in CTA/RADAR?

13. **SARTIME or Flight Note:**
    - Submitted 30 mins before EOBT if travelling:
      - (a) Further than 120 nm
      - (b) Through a designated remote area or
      - (c) Over water

---

Enjoy your flight

---

Note methods of determining cloud amounts (AIP ENR 1.1)
Ratings and endorsements

CASR 61.E and 61.O

**Authorisation of a night VFR rating** CASR 61.955

The holder of a pilot licence and a night VFR rating is authorised to pilot an aircraft at night under VFR, except if the operation is one of the following, for which an additional rating is required (see CASR Subpart 61.P and Subpart 61.Q) (CASR 61.955, CASR 61.375):

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

**The grant of a night VFR rating** CASR 61.975

An applicant for a night VFR rating must:

- hold a private pilot licence, commercial pilot licence or air transport pilot licence
- meet the requirements for the grant of at least one endorsement listed in the table on page 3.115
- have at least 10 hours of aeronautical experience at night in an aircraft or an approved flight simulation training device for the purpose, including at least five hours of dual cross-country flight time at night under VFR in an aircraft and
- have passed the flight test mentioned in the Part 61 manual of standards (MOS) for the night VFR rating.

**The grant of a night VFR endorsement** CASR 61.990

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

- completed flight training for the endorsement
- met the aeronautical experience requirements in the following table, and
- passed the flight test mentioned in Part 61 MOS for the endorsement.
## Night VFR endorsements

<table>
<thead>
<tr>
<th>Endorsement</th>
<th>Activities authorised</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Single-engine aeroplane night VFR endorsement</td>
<td>Pilot an aeroplane of the single-engine aeroplane class at night under VFR</td>
<td>At least five hours of aeronautical experience at night as pilot of an aeroplane (or an approved flight simulation training device for the purpose), including at least one hour of dual flight and one hour of solo night circuits. At least three hours of dual instrument time.</td>
</tr>
<tr>
<td>2 Multi-engine aeroplane night VFR endorsement</td>
<td>Pilot an aeroplane at night under VFR</td>
<td>At least five hours of aeronautical experience at night as pilot of a multi-engine aeroplane (or an approved flight simulation training device for the purpose), including at least one hour of dual flight and one hour of solo night circuits. At least three hours of dual instrument time.</td>
</tr>
<tr>
<td>3 Helicopter night VFR endorsement</td>
<td>Pilot a helicopter at night under VFR</td>
<td>At least 10 hours of aeronautical experience at night as pilot of a helicopter (or an approved flight simulation training device for the purpose), including at least three hours of dual flight and one hour of solo night circuits. At least three hours of dual instrument time in a helicopter (or approved flight simulation training device for the purpose).</td>
</tr>
<tr>
<td>4 Powered lift aircraft night VFR endorsement</td>
<td>Pilot a powered lift aircraft at night under VFR</td>
<td>At least five hours of aeronautical experience at night as pilot of a helicopter or powered lift aircraft (or an approved flight simulation training device for the purpose), including at least three hours of dual flight and one hour of solo night circuits. At least three hours of dual instrument time.</td>
</tr>
<tr>
<td>5 Gyroplane night VFR endorsement</td>
<td>Pilot a gyroplane at night under VFR</td>
<td>At least five hours of aeronautical experience at night as pilot of a helicopter (or gyroplane or an approved flight simulation training device for the purpose), including at least three hours of dual flight and one hour of solo night circuits. At least three hours of dual instrument time.</td>
</tr>
<tr>
<td>6 Airship night VFR endorsement</td>
<td>Pilot an airship at night under VFR</td>
<td>At least five hours of aeronautical experience at night as pilot of an airship (or an approved flight simulation training device for the purpose), including at least three hours of dual flight and one hour of solo night circuits.</td>
</tr>
</tbody>
</table>

Source: CASR Table 61.980
Recent experience requirements

**For night VFR flight** CASR 61.965

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

- carried out the following in an aircraft of that category while controlling the aircraft:
  - at least one night take-off and
  - at least one night landing or

- been assessed as competent to fly at night in an aircraft of that category by a flight instructor who holds a night VFR training endorsement.

**To carry passengers at night** CASR 61.395

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

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

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

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

**Note**—A ‘relevant check or review’ includes either:

- an instrument proficiency check; a night vision imaging system proficiency check; an instructor proficiency check; an operator proficiency check or
- a flight review.
**Flight review** CASR 61.970

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

- multi-engine aeroplane
- multi-engine helicopter or
- an aircraft other than a multi-engine aeroplane or multi-engine helicopter.

The holder of a night VFR rating is authorised to pilot an aircraft of one of the categories mentioned in the paragraph above at night under VFR only if, within the previous 24 months, the holder:

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

Radio communication systems

<table>
<thead>
<tr>
<th>Class</th>
<th>Night VFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airspace</td>
<td>Classes A, C, D, E, G</td>
</tr>
<tr>
<td>Communication requirements</td>
<td>VHF</td>
</tr>
<tr>
<td>Remarks</td>
<td>VHF communications systems must be capable of communication on all VHF frequencies required to meet the reporting and broadcast requirements of ENR 1.1 (see page 3.21)</td>
</tr>
</tbody>
</table>

Source: AIP GEN 1.5

Flight notification

<table>
<thead>
<tr>
<th>Flight category</th>
<th>Class of operation</th>
<th>Type of operation</th>
<th>Summary of flight notification options</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFR</td>
<td>All classes</td>
<td>All operations</td>
<td>Full flight details</td>
</tr>
<tr>
<td>VFR</td>
<td>RPT and CHTR</td>
<td>All operations</td>
<td>SARTIME or flight note</td>
</tr>
<tr>
<td>VFR</td>
<td>AWK and PVT</td>
<td>Over-water flights</td>
<td>SARTIME or flight note</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In designated remote areas</td>
<td>SARTIME or flight note</td>
</tr>
<tr>
<td></td>
<td></td>
<td>At night proceeding beyond 120 nm from the aerodrome of departure</td>
<td>SARTIME or flight note</td>
</tr>
<tr>
<td>VFR</td>
<td>AWK and PVT</td>
<td>All other operations</td>
<td>SARTIME, flight note or no notification</td>
</tr>
</tbody>
</table>

Submission of flight details at least 30 minutes before ETD is recommended.

Radio navigation systems

<table>
<thead>
<tr>
<th>Type of operation</th>
<th>Night VFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>System number</td>
<td>1</td>
</tr>
<tr>
<td>System type</td>
<td>ADF, VOR or GNSS</td>
</tr>
<tr>
<td>Conditions</td>
<td>In this table GNSS refers to equipment certified to TSO-C129, C145, C146, C196a as determined by CASA</td>
</tr>
</tbody>
</table>

Source: AIP GEN 1.5
Lighting

The following lighting equipment is required for night VFR flight (CAO 20.18 Appendix V, CAR 174A):

- **Instrument illumination**
  
  Illumination for all instruments and equipment used by the flight crew that are essential for the safe operation of the aircraft. The illumination shall be such that:

  - all illuminated items are easily readable or discernible, as applicable
  - its direct or reflected rays are shielded from the pilot’s eyes
  - its power supply is so arranged that in the event of the failure of the normal source of power, an alternative source is immediately available and
  - it emanates from fixed installations.

- **Intensity control**
  
  A means of controlling the intensity of the illumination of instrument lights, unless it can be demonstrated that non-dimmed instrument lights are satisfactory under all conditions of flight likely to be encountered.

- **Landing lights**
  
  Two landing lights except that, in accordance with the provisions of CAR 308, aircraft engaged in private and aerial work operations and charter operations not carrying passengers for hire and reward are exempt from this requirement, provided that one landing light is fitted.

  **Note**—A single lamp having two separately energised filaments may be approved as meeting the requirement for two landing lights.

- **Passenger compartment lights**
  
  Lights in all passenger compartments.

- **Pilots’ compartment lights**
  
  A means of lighting the pilots’ compartment to provide illumination adequate for the study of maps and the reading of flight documents.

- **Position and anti-collision lights**
  
  Equipment for displaying the lights prescribed in CAR 196.

  **Note**—In accordance of the provision of CAR 195 (1), position and anti-collision lights shall be displayed at night and in conditions of poor visibility.
• Emergency lighting

Emergency lighting and a shock-proof electric torch for each crew member at the crew member station.

**Navigation lights** CAR 196

Unless CASA otherwise directs, an aeroplane in flight or operating on the manoeuvring area of a land aerodrome will display the following navigation lights:

- an unobstructed red light projected above and below the horizontal plane through an angle from dead ahead to 110° port
- an unobstructed green light projected above and below the horizontal plane through an angle from dead ahead to 110° starboard and
- an unobstructed white light projecting above and below the horizontal plane rearward through an angle of 140°, equally distributed on the port and starboard sides.

Unless CASA otherwise directs, navigation lights shall be steady lights.

Unless CASA otherwise directs, an aeroplane in flight or operating on the manoeuvring area of a land aerodrome will display, in addition to the navigation lights, an anti-collision light consisting of a flashing red light visible in all directions within 30° above and 30° below the horizontal plane of the aeroplane.

**Aircraft navigation lights**
Where the lights are flashing lights, the aircraft:

- shall display an additional flashing white light visible in all directions and
- may display an additional flashing red rear light

Unless CASA directs otherwise, wing-tip clearance lights comprising steady lights of the appropriate colours must be displayed if the distance of the navigation lights from the wing-tip is more than 2 m.

At an aerodrome used or available for use in night flying operations, an aircraft parked on or adjacent to the movement area shall be clearly illuminated or lit, unless the area it occupies is marked by obstruction lights.

**Exemptions**—Where an aircraft is not equipped in accordance with the above, CASA may give permission, subject to such conditions (if any), for the aircraft to be flown under VFR.

**Instruments**

The flight and navigational instruments required for night VFR operations are (CAO 20.18 Appendix IV):

- an airspeed indicating system
- a sensitive altimeter
- a direct reading magnetic compass, or a remote indicating compass and a standby direct reading magnetic compass
- an accurate timepiece indicating the time in hours, minutes and seconds, except that this may be omitted if it is carried by the pilot or navigator
- an outside air temperature indicator
- an attitude indicator (artificial horizon)
- a heading indicator (directional gyroscope)
- a turn and slip indicator, except that only a slip indicator is required when a second attitude indicator usable through flight attitudes of 360° of pitch and roll is installed and
- a means of indicating whether the power supply to the gyroscopic instruments is working satisfactorily.

**Note**—For night VMC flights a rate of climb and descent indicator (vertical speed indicator) and pitot heat are not required.
Alternate static source

The altimeter and airspeed indicator must be capable of being connected to either a normal or an alternate static source, but not both sources simultaneously. Alternatively, they can be connected to a balanced pair of flush static ports.

Duplicated gyro power source

For night VFR charter the attitude indicator, heading indicator and turn and slip indicator will have duplicated sources of power supply, unless the turn and slip indicator or the second attitude indicator specified above has a source of power independent of the power operating other gyroscopic instruments. Note that these duplicated sources of power are not required for aeroplanes engaged in private and aerial work night VMC operations.

A gyro-magnetic type of remote indicating compass also meets the requirement for a heading indicator specified above provided that such installation complies with the duplicated sources of power supply requirements of the previous paragraph.

Exemptions—Where an aircraft is not equipped in accordance with the above, CASA may give permission, subject to such conditions (if any), for the aircraft to be flown under VFR.

Serviceability of instruments and equipment CAO 20.18 (10)

All instruments and equipment fitted to an aircraft shall be serviceable prior to take-off unless:

• flight with unserviceable instruments or equipment has been approved by CASA
• the unserviceability is permitted under the provisions of a permissible unserviceability schedule or
• the unserviceable instruments or equipment are not required under the regulations.

Where flight is conducted with unserviceable instruments or equipment, the unserviceable instruments or equipment shall be prominently placarded ‘Unserviceable’ or removed from the aircraft.

Note—Where an instrument or item of equipment performs more than one function, it is permissible to placard as unserviceable only the function(s) which are unserviceable.

A charter, aerial work or private operator may elect to have a permissible unserviceability schedule. In the case of charter or aerial work operators, the permissible unserviceability schedule shall be incorporated in the operator’s operations manual.
General flight operations

VFR flights at night CAR 174B

Except with the permission of CASA and when it is necessary for take-off or landing, the pilot in command of an aircraft must not fly the aircraft at night under VFR:

- at a height less than 1000 ft above the highest obstacle located within 10 nm of the aircraft.

Note—Do not conduct charter, aerial work and private operations under night VFR unless the meteorological forecast indicates that the flight can be conducted in VMC at not less than 1000 ft above the highest obstacle within 10 nm either side of track (AIP ENR 1.10).

A single-engine aircraft must not be flown at night under VFR except in the following operations:

- private operations
- aerial work operations
- charter operations that do not involve the carrying of passengers for hire or reward and
- charter operations that involve the carrying of passengers for hire or reward, if
  - the operator has CASA’s written approval for the operations and
  - the operations are conducted in a turbine-powered aeroplane approved in writing by CASA for those operations.

Circuit training operations at night AIP ENR 1.1

Aircraft engaged in training operations at night in the circuit area must not, when below 1500 ft AGL, carry out any manoeuvres which involve:

- the simulation of failure of an engine or
- flight in a simulated one engine inoperative condition or
- the intentional shutdown of a serviceable engine.
Lowest safe altitude

**Operational requirements** CAR 174B, AIP GEN 3.3

The pilot in command of an aircraft must not fly the aircraft at night under VFR at a height of less than 1000 ft above the highest obstacle located within 10 nm of the aircraft in flight if it is not necessary for take-off or landing.

The area to be considered must be:

- the area specified for aircraft being navigated by means of a radio navigation system or
- within a radius of 10 nm from any point along the aircraft’s nominal track.

However, an aircraft which has positively determined by visual fix that a critical obstruction has been passed may descend immediately to a lower altitude, provided that the required obstacle clearance above significant obstructions ahead of the aircraft is maintained.

An aircraft must not be flown at night under VFR lower than the published lowest safe altitude or the lowest safe altitude calculated in accordance with this section except:

- during take-off and climb in the vicinity of the departure aerodrome
- when the destination aerodrome is in sight and descent can be made within the prescribed circling area of three nm radius of the destination or
- when being radar vectored.

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

Grid LSALTs have been determined for ERC and TAC. On ERC-H, the grid for each LSALT is a square with the dimensions of four degrees of latitude by four degrees of longitude. On ERC-L and TAC, the grid squares comprise one degree of latitude by one degree of longitude. The grid LSALT is normally displayed in the centre of the grid square.

A pilot using grid LSALT for obstacle clearance is responsible for determining the allowance for navigation error that should be applied, considering the limitations of the navigation aids or method of navigation being used for position fixing. This navigation error allowance must be applied to the proposed track. The highest grid LSALT falling within the area covered by the determined navigation error must be used.
LSALT details for RNAV routes are shown in each grid square formed by the parallels and meridians. On the ERC-H, the grid is at 4 degree intervals, and at 1 degree intervals on the ERC-L and TACs (See also AIP GEN 3.3).

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

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

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

**LSALT not published on aeronautical charts** AIP GEN 3.2 and AIP GEN 3.3

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

- where the highest obstacle is more than 360 ft above the height determined for terrain, the LSALT must be 1000 ft above the highest obstacle or
- where the highest obstacle is less than 360 ft above the terrain, or there is no charted obstacle, the LSALT must be 1360 ft above the elevation determined for terrain except
- where the elevation of the highest terrain or obstacle in the tolerance area is not above 500 ft, the LSALT must not be less than 1500 ft.

If the navigation of the aircraft is inaccurate, or the aircraft is deliberately flown off track, or whenever there is failure of any radio navigation aid normally available, the pilot in command must ensure that the aircraft is flown not lower than 1000 ft above the highest terrain or obstacle within a circle, centred on the DR position, with a radius of five nm plus 20 per cent of the air distance flown from the last positive fix.
For routes defined by radio navigation aids or to be navigated by DR: the area to be considered must be within an area of five nautical miles surrounding and including an area defined by lines drawn from the departure point or en route radio aid, 10.3 degrees each side of the nominated track (where the track guidance is provided by a radio navigation aid), or 15 degrees each side of the nominal track (where no track guidance is provided) to a limit of 50 nm each side of the track, thence paralleling track to abeam the destination and then converging by a semicircle of 50 nm radius centred on the destination. On shorter routes, where these lines are displaced by less than 50 nm abeam the destination, they shall converge by a radius based on the lesser distance. Where the lines thus drawn at any time come within the coverage of an en route or destination radio aid the aircraft is equipped to use, they will converge by straight lines to that aid. The minimum angle of convergence which must be used in this case is 10.3 degrees each side of track (AIP GEN 3.3).

**Rated coverage** AIP GEN 1.5

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

<table>
<thead>
<tr>
<th>Aircraft altitude</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NDB (published in <em>ERSA FAC</em>)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>VOR and DME</strong></td>
<td></td>
</tr>
<tr>
<td>Below 5000 ft</td>
<td>60 nm</td>
</tr>
<tr>
<td>5000 ft to below 10,000 ft</td>
<td>90 nm</td>
</tr>
<tr>
<td>10,000 ft to below 15,000 ft</td>
<td>120 nm</td>
</tr>
<tr>
<td>15,000 ft to below 20,000 ft</td>
<td>150 nm</td>
</tr>
<tr>
<td>20,000 ft and above</td>
<td>180 nm</td>
</tr>
<tr>
<td><strong>Localiser</strong></td>
<td></td>
</tr>
<tr>
<td>At 2000 ft AGL within ±10° of course line</td>
<td>25 nm</td>
</tr>
<tr>
<td>Below 5000 ft</td>
<td>30 nm</td>
</tr>
<tr>
<td>5000 and above ft</td>
<td>50 nm</td>
</tr>
</tbody>
</table>
Calculation of LSALT

How to calculate LSALT

Air distance + 20% + 5 nm

DR position

Track made good

Last positive fix

Planned track

10 nm

Planned track

10 nm
How to calculate LSALT at night

**Operations – Night VFR – Lowest safe altitude**

**LSALT 2460 ft**

- Marked obstacle
- 1460 ft
- 1000 ft

460 ft + 1000 ft = 1460 ft + 1000 ft = LSALT 2460 ft

**How to calculate LSALT at night – with additional unmarked obstacle**

**LSALT 2360 ft**

- Marked obstacle
- 1260 ft
- 1000 ft

260 ft + 1000 ft = 1260 ft + 1000 ft = LSALT 2360 ft

Assuming an obstacle is 360 ft beside marked obstacle
360 ft + 1000 ft = 1360 ft + 1000 ft = LSALT 2360 ft
How to calculate LSALT with short leg between NAVAID and NAVAID

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

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

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

**General** AIP ENR 1.1

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

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

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

**Weather**

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

- For aeroplanes by day or night, or for helicopters by night only:
  - cloud base ceiling of 1500 ft AGL; and
  - a visibility of 8 km.

**Radio navigation aids**

A flight permitted to operate under night VFR must provide an alternate aerodrome within a one hour flight time of the destination unless:

- the destination is served by a radio navigation aid (NDB/VOR) and the aircraft is fitted with the appropriate radio navigation system capable of using the aid or
- the aircraft is fitted with an approved GNSS receiver, and the pilot and aircraft are authorised for its operation (see AIP GEN 1.5).

**Runway lighting**

**Portable lighting**

When a flight is planned to land at night at an aerodrome where the runway lighting is portable, an alternate is required unless arrangements are made for a responsible person to be in attendance during the arrival and departure times as specified in aerodrome lighting—times of activation (see page 3.133), to ensure that the runway lights are available.
Standby power
When a flight is planned to land at night at an aerodrome with electric runway lighting, whether pilot activated or otherwise, but without standby power, an alternate is required unless portable runway lights are available and arrangements have been made for a responsible person to be in attendance during the arrival and departure times specified in aerodrome lighting—times of activation (see below), to display the portable lights in the event of a failure of the primary lighting.
This alternate need not have standby power or standby portable runway lighting.

Pilot-activated lighting (PAL)
When a flight is planned to land at night at an aerodrome with PAL and standby power, an alternate is required unless a responsible person is in attendance to switch on the aerodrome lighting manually.
This alternate need not have standby power or standby portable runway lighting.

Alternate aerodromes—PAL
An aerodrome may be nominated as an alternate provided that, if the aircraft is fitted with a single VHF communication, the alternate aerodrome must be one which is:
• served by a lighting system which is not pilot activated; or
• served by PAL, with a responsible person in attendance to manually switch on the aerodrome lighting.

For private, airwork and charter night VFR operations, where the alternate aerodrome is served by PAL, there is no need for a responsible person on the ground to be in attendance, but the aircraft must be equipped with:
• dual VHF or
• single VHF and HF communications and carry 30 minutes holding fuel to allow for the alerting of ground staff in the event of a failure of the aircraft’s VHF communication.

Aerodrome lighting—times of activation AIP ENR 1.1
When aerodrome lighting is required and PAL is not being used, the pilot in command or operator must ensure that arrangements have been made for the lighting to be operating during the following periods:
• Departure—from at least 10 minutes before departure to at least 30 minutes after take-off and
• **Arrival**—from at least 30 minutes before ETA to when landing and taxiing have been completed.

The above shall apply to runway, obstacle and taxiway lighting.

**Responsible person AIP ENR 1.1**

A responsible person referred to above in relation to portable lights, is one who has been instructed in, and is competent to display, the standard runway lighting with portable lights.

**Fuel to first light**

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

**Controlled aerodrome lighting AIP ENR 1.1**

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

A pilot who has made arrangements with ATC for night lighting must notify any change in requirements.

**Non-controlled aerodrome lighting AIP ENR 1.1**

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

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

**Further information**

A comprehensive advisory circular (AC 61-05) on Night VFR rating can be viewed at [www.casa.gov.au](http://www.casa.gov.au)
Visit OnTrack at
www.casa.gov.au/ontrack
for helicopter procedures at
13 major aerodromes around
Australia
Requirements

Licensing

Private pilot licence and helicopter category rating

See page 1.5 and CASR 61.515 for general private pilot licence and other licensing information.

An applicant (who has completed an integrated training course) for a PPL with a helicopter category rating must have at least 35 hours of aeronautical experience that includes at least: (CASR 61.530)

• 30 hours of flight time as pilot of a helicopter
• 10 hours of solo flight time in a helicopter
• five hours of solo cross-country flight in a helicopter
• two hours of dual instrument time and
• one hour of dual instrument time in a helicopter.

An applicant (who has not completed an integrated training course) for a PPL with a helicopter category rating must have at least 40 hours of aeronautical experience that includes at least: (CASR 61.550)

• 30 hours of flight time as pilot of a helicopter
• 10 hours of solo flight in a helicopter
• five hours of solo cross-country flight time in a helicopter
• two hours of dual instrument time and
• one hour of dual instrument time in a helicopter.

Note ‘Integrated training’ is an intensive course of training, which involves ground theory training integrated with practical flight training by the same operator and according to a syllabus [CASR Dictionary Part 1 (integrated training)].
Any of the required aeronautical experience that is not completed as flight time as a pilot must be completed as:

- simulated flight time in an approved flight simulator device for the purpose or
- tethered flight time.

The cross-country flight time mentioned above must include a flight of at least 100 nm during which a landing is made at each of two landing areas, other than the one from which the flight began.

The flight time in a helicopter must be completed in a registered or recognised helicopter. A registered aircraft is an aircraft that is registered in accordance with CASR Part 47 and a recognised helicopter is one that is either on the register of aircraft kept by a contracting state or is a state aircraft (for example, police or military) (CASR Dictionary Part 1).

Recent experience

**Flight reviews** CASR 61.400, 61.745, 61.800, 61.970

See Section 1 page 1.10 for information regarding flight reviews for flight crew ratings.

**Carrying passengers**

See Section 1 page 1.10 for information regarding the carrying of passengers under a PPL.
Equipment

Instruments for VFR operations
CAO 20.18 (3.2), Appendix VI, Appendix VIII, Appendix IX. See also GEN 1.5

Day VFR
In addition to any other instruments and indicators specified in the helicopter’s flight manual, a helicopter may only be operated under VFR if it is equipped with the following:

- an airspeed indicating system
- an altimeter, with a readily adjustable pressure datum setting scale graduated in millibars
- one of the following
  - a direct reading magnetic compass or
  - a remote indicating magnetic compass and a standby direct reading magnetic compass and
- an accurate timepiece indicating hours, minutes and seconds (may be carried on the pilot or navigator) and
- if conducting flight under VFR and engaged in RPT, charter, aerial work operations or when conducting a flight at night:
  - a slip indicator and
  - an outside air temperature indicator when operating from or at a location at which ambient air temperature is not available from ground-base instruments.

Night VFR
In addition to the requirements for day VFR specified in the paragraph above, a helicopter operating under night VFR must be equipped with:

- an attitude indicator (artificial horizon)
- except for agricultural operations, either
  - a standby attitude indicator or
  - a turn indicator and
- except for agricultural operations
  - a heading indicator (directional gyroscope)
  - a vertical speed indicator and
  - a means of indicating whether the power supply to the gyroscope instrument is working satisfactorily.
Additional equipment requirements

For flights under night VFR, requirements additional to those specified for day VFR and night VFR apply, except for agricultural operations. These additional requirements are as follows:

- For operations onto vessels or platforms at sea by night VFR, an instantaneous vertical speed indicator is required in place of the vertical speed indicator specified for night VFR.
- The attitude indicator and standby attitude indicator or turn indicator that are specified for night VFR shall have separate and independent power sources and
- A gyro-magnetic type of remote indicating compass installed to meet the requirements as specified for day VFR may be considered also to meet the requirement for heading indicator for night VFR operations, provided that such an installation also has separate and independent power sources.

Hot refuelling

Hot refuelling is generally associated with a commercial operation and requires compliance with an operations manual, and therefore will not be covered in this document except to outline its general concept below.

‘Hot refuelling’ means the refuelling of a helicopter with its engine or engines running.

Hot refuelling of a helicopter may take place with its rotor or rotors rotating.

Hot refuelling of a helicopter must not be carried out unless authorised by its operator. The operator of a helicopter who authorises hot refuelling of that helicopter must include in the operations manual:

- the operational circumstances in which hot refuelling may take place
- the procedures to be followed during hot refuelling
- the requirements and instructions, if any, set out in the helicopter’s flight manual that relate to hot refuelling and
- if applicable, the instructions to ensure fuel quality as required for the purposes of CAO 20.10 sub-paragraph 7.2 (b).
Special VFR

AIP ENR 1.2

By day, when visual meteorological conditions (VMC) do not exist, the ATC unit responsible for a CTR may authorise, at pilot request, a special VFR flight in the CTR, or in a CTA next to the CTR for the purpose of entering or leaving the CTR, provided that:

- the special VFR flight will not unduly delay an IFR flight
- the flight can be conducted clear of cloud
- the visibility is not less than 800 m (for helicopters)
- a helicopter will be operated at such a speed that the pilot has adequate opportunity to observe any obstructions or other traffic in sufficient time to avoid collisions and
- the flight can be conducted in accordance with the requirements of CAR 157 with regards to low flying.

Alternates

See page 2.4 for general information regarding alternate requirements for VFR operations and page 3.132 for VFR operations at night.

When operating a helicopter under VFR, and if the use of helicopter VMC is permissible at the destination, the pilot in command must provide for a suitable alternate aerodrome when either of the following conditions is forecast at the destination (AIP ENR 1.1):

- By night:
  - cloud—more than SCT below a ceiling of 1500 ft or
  - visibility—less than 8 km.
- By day:
  - the same as night (above) unless the helicopter VMC requirements specified in AIP ENR 1.2 (see page 4.6) are met, in which case the following meteorological conditions apply:
    - cloud—more than SCT below a ceiling of 1000 ft or
    - visibility—less than 3000 m.
## Visual meteorological conditions

**AIP ENR 1.2**

### VMC—non-controlled airspace

<table>
<thead>
<tr>
<th>Height</th>
<th>Flight VIS</th>
<th>Distance from cloud</th>
<th>Additional conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(a) Below 700 ft above ground or (b) Below 700 ft above water when operating at a distance from land that allows compliance with CAR 258(1)</td>
<td>800 m</td>
<td>Clear of cloud</td>
</tr>
</tbody>
</table>

<p>| (a) Day operation only |
| (b) At a speed that allows the pilot adequate opportunity to see any obstructions or air traffic in sufficient time to avoid collision |
| (c) If operating less than 10 nm from an aerodrome with an approved instrument approach procedure, then: |
| (i) in accordance with all requirements to report, broadcast and maintain a listening watch and |
| (ii) maintaining a separation of at least 500 ft vertically from any aircraft conducting an IFR operation less than 10 nm from the aerodrome |</p>
<table>
<thead>
<tr>
<th>Height</th>
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<th>Distance from cloud</th>
<th>Additional conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Below 700 ft above water when operating at a distance from land greater than that which allows compliance with CAR 258 (1)</td>
<td>1 5000 m if only condition 1 is complied with or 2 800 m if conditions 1 and 2 are both complied with</td>
<td>1 600 m horizontal and 500 ft vertical, if only condition 1 is complied with or 2 Clear of cloud, if conditions 1 and 2 are both complied with</td>
<td>1 (a) Day operation only; (b) At a speed that allows the pilot adequate opportunity to see any obstructions or air traffic in sufficient time to avoid collision (c) If operating less than 10 nm from an aerodrome with an approved instrument approach procedure, then: (i) in accordance with all requirements to report, broadcast and maintain a listening watch and (ii) maintaining a separation of at least 500 ft vertically from any aircraft conducting an IFR operation less than 10 nm from the aerodrome 2 The applicable distances for vertical and horizontal distances from cloud visibility do not apply if the helicopter: (a) uses track guidance provided by an approved operating radio navigation aid and (b) is equipped with a complementary radio navigation system</td>
</tr>
</tbody>
</table>

Source: AIP ENR 1.2
**VMC—non-controlled airspace**

- **10 000 ft (AMSL)**
  - Visibility 8 km
  - Clear of cloud

- **3000 ft (AMSL)**
  - Visibility 5000 m
  - Clear of cloud

- **1000 ft (AGL)**
  - Visibility 800 m
  - Reduced speed
  - 700 ft

- 10 nm

**Aerodrome with instrument approach procedure**

**Same VMC in controlled airspace but ATC may direct higher conditions, or permit VFR flight in lower conditions**

**Aircraft may take off or land if flight at the minimum altitude permissible on the proposed flight path can be made in VMC**
Aerodromes

**General** AIP ENR 1.1

The procedures in this section apply to all helicopters operating in the vicinity of aerodromes and in helicopter–access corridors and lanes, in accordance with the provisions of CARs 92, 157, 163, 166, AIP ENR 1.1 and CAAPs 92-2(2) and 92-4(0).

**Use of aerodromes** CAR 92

An aircraft shall not land at, or take off from, any place unless having regard to all the circumstances of the proposed landing or take-off (including the prevailing weather conditions); and the following:

- it is an aerodrome established under the air navigation regulations
- the use of the place as an aerodrome is authorised by a certificate granted, or registration, under CASR Part 139
- the place is a defence force aerodrome for which CASA has authorised civil operations in accordance with section 20 of the Act or
- the place is suitable for use as an aerodrome and the aircraft can land at, or take off from, the place in safety.

**Taxiing**

For all helicopters, maximum use of the ‘air transit’ procedure should be made to expedite traffic movement and flow about an aerodrome.

All helicopters may use ‘air taxiing’ procedures as required. However, wheeled helicopters, where practicable, are encouraged to ‘ground taxi’ on prepared surfaces to minimise rotor wash and its effects.

At night a helicopter should not taxi via routes which do not meet the physical dimensions and lighting requirements specified in CAAP 92.

**Take-off/departure**

**Take-off/departure—controlled aerodrome**

At locations within controlled airspace, helicopters may be granted a take-off clearance or instructed to report airborne, as appropriate, from any area nominated by ATC or the pilot, and assessed by the pilot as being suitable as an HLS.
Helicopters taking off or departing must proceed in accordance with ATC instructions.

Subject to clearance, a turn after take-off may be commenced when the pilot considers that the helicopter is at a safe height to do so.

Unless requested by the pilot, a take-off clearance will not be issued for a helicopter if the tailwind component exceeds 5 kt.

Prescribed exit ‘gates’ and associated standard routes and/or altitudes may be provided to facilitate the flow of helicopter traffic. Procedures for their use will be promulgated in ERSA. Use of these ‘gates’ is not mandatory. Helicopters may, subject to an ATC clearance, revert to the standard traffic procedures applicable to aeroplanes. This option may be more appropriate when operating larger helicopters.

At night a helicopter should not take-off from a site other than one which conforms to the requirements specified in CAAP 92. Any illuminated runway or illuminated taxiway of dimensions commensurate with the size of the helicopter landing site applicable to the helicopter, in accordance with CAAP 92, is considered to meet the requirements of CAAP 92.

**Take-off/departure — non-controlled aerodromes** AIP ENR 1.1

At a non-controlled aerodrome a pilot may take off from any area which is assessed as being suitable as an HLS.

When the pilot elects to conduct the take-off from outside the flight strip of the runway in use by aeroplanes, the helicopter take-off path must be outside that flight strip.

Before take-off, the helicopter is to be positioned to the appropriate side of the runway in use so that the turn after take-off does not cross the extended centre line of that runway. The pre-take-off positioning of the helicopter will be by air transit or by taxiing as appropriate.

The turn after take-off onto the desired departure track may be commenced when the pilot considers that the helicopter is at a safe height to do so. If the resultant departure track conflicts with the aeroplane traffic pattern, the helicopter should remain at 500 ft above the surface until clear of that circuit pattern. Where this procedure is not practicable on environmental grounds, the helicopter is to adopt the standard departure procedure applicable to aeroplanes.

Pilots of radio-equipped helicopters must broadcast intentions on the appropriate frequency before take-off.
Helicopter access corridors and lanes AIP ENR 1.1

The following procedures apply for operations within promulgated helicopter access corridors and lanes:

- maximum IAS of 120 kt
- helicopters must operate under VFR, usually not below 500 ft above the surface by day, subject to flight over populous area restrictions and the limitations published in ERSA for authorised corridors by night
- ‘see-and-avoid’ procedures must be used
- formation flights are restricted to line astern with the lead aircraft responsible for maintaining separation from other traffic in accordance with ‘see-and-avoid’ procedures
- a traffic advisory service is available in access corridors
- an ATS Surveillance System advisory service may be given at designated aerodromes
- a continuous listening watch on the appropriate ATS frequency in access corridors or broadcast frequency in lanes is mandatory
- two-way operations are conducted with all traffic keeping to the right of the central geographical/topographical feature(s) as detailed in ERSA
- the pilot-in-command has the responsibility to ensure that operations are confined within the boundaries of the corridor or lane
- the limits of corridors and lanes must be adhered to, with any transitional altitude requirements maintained within an accuracy of ±100 ft and
- a helicopter not confining its operations to an access corridor will require ATC clearance and, while outside the corridor, will be subject to separation standards as applied by ATC.

Note—Subject to environmental noise considerations, the imposition of limitations on helicopters which exceed the noise limits specified in ICAO Annex 16 Vol 1 may be necessary.
Arrivals

**Arrivals—controlled aerodromes AIP ENR 1.1**

At a controlled aerodrome, prescribed entry ‘gates’ and associated standard routes and/or altitudes may be provided to facilitate the flow of helicopter traffic. Procedures for their use will be publicised in **ERSA**. Use of these ‘gates’ is not mandatory. Subject to the receipt of an ATC clearance, helicopters may, if required, conform to the standard traffic procedures applicable to aeroplanes. This option may be more appropriate when operating larger helicopters.

At locations within controlled airspace, helicopters may be granted a landing clearance or be instructed to report on the ground, as appropriate, at any area nominated by ATC or the pilot, and assessed by the pilot as being suitable as an HLS.

Unless requested by the pilot, a landing clearance will not be issued for a helicopter if the tailwind component exceeds 5 kt.

At night a helicopter should not land at a site other than one which conforms to the requirements specified in the latest issue of **CAAP 92**. Any illuminated runway or illuminated taxiway of dimensions commensurate with the size of the helicopter landing site applicable to the helicopter, in accordance with **CAAP 92**, is considered to meet the requirements of **CAAP 92**.

**Arrivals—non-controlled aerodromes AIP ENR 1.1**

At a non-controlled aerodrome in VMC by day applicable to the aircraft category, helicopters need not join the circuit via standard aeroplane entry procedures, at the pilot’s discretion.

As an alternative, helicopters may join the circuit area at 500 ft above the surface from any direction, subject to the normal restrictions of flight over populous areas. Helicopters must avoid other circuit traffic and descend to land at any location assessed by the pilot as being suitable for use as an HLS, provided:

- the intended landing point is located outside the flight strip of the runway in use
- the final approach is clear of the extended centreline of the runway in use and
- post-landing positioning of the helicopter is by air transit or by taxiing as appropriate.

Pilots of radio-equipped helicopters must broadcast intentions on the appropriate frequency as specified in AIP ENR 1.1.
Circuit procedures AIP ENR 1.1

At controlled aerodromes any specific operating procedures applicable to the helicopter traffic pattern will be detailed in ENSA.

Either of the following generally applies:

- where possible, helicopter circuit traffic will be separated from the aeroplane traffic pattern by the use of contra-direction circuits, outside and parallel to the flight strip of the runway in use, and at a lower altitude than other traffic, but not below 500 ft above the aerodrome elevation or

- when separate circuit patterns are not practicable, helicopters may utilise the same traffic pattern direction as other traffic, and will normally operate inside and at a lower altitude than that traffic, but not below 500 ft above the aerodrome elevation.

At non-controlled aerodromes the following circuit operating procedures apply:

- helicopters may be operated on contra-direction circuits and parallel to the aeroplane traffic pattern at a lower altitude than that traffic, but not below 500 ft above the aerodrome elevation. The landing site associated with the helicopter circuit is to be positioned outside the flight strip of the runway in use so that helicopter circuit traffic does not cross the extended centre line of that runway;

- if the procedure outlined in the paragraph above is not practicable:
  - the helicopter circuit patterns should be flown inside and parallel to the aeroplane traffic, and at lower altitudes, but not below 500 ft above the aerodrome elevation. The landing site associated with the helicopter circuit must be positioned outside the flight strip of the runway in use so that helicopter circuit traffic does not cross the extended centre line of that runway or
  - the helicopter must follow the standard aeroplane traffic pattern and, in this case, may use the flight strip area of the runway in use and

- the pilots of radio-equipped helicopters must broadcast their intentions and listen out for other traffic on the appropriate frequency.
Low flying

**Low flying** CAR157

An aircraft must not fly over:

- any city, town or populous area, at a height lower than 1000 ft or
- any other area at a height lower than 500 ft.

**Note**—The heights specified above are heights above the highest point of the terrain, and any object on it, within a radius of 300 m, from a point on the terrain vertically below the aircraft.

The above does not apply to a helicopter flying at a designated altitude within an access lane, details of which have been published in the AIP or NOTAMs for use by helicopters arriving at or departing from a specified place. In addition, the above does not apply if:

- through stress of weather or any other unavoidable cause it is essential that a lower height be maintained
- the aircraft is engaged in private or aerial work operations, being operations that require low flying, and the owner or operator of the aircraft has received from CASA either a general permit for all flights, or a specific permit for the particular flight, to be made at a lower height while engaged in such operations
- the pilot of the aircraft is engaged in flying training and flies over part of a flying training area in which low flying is authorised by CASA under CAR 141(1)
- the pilot of the aircraft is engaged in a baulked approach procedure, or the practice of such procedure under the supervision of a flight instructor or a check pilot
- the aircraft is flying in the course of actually taking off or landing at an aerodrome
- the pilot of the helicopter is engaged in
  - a search
  - a rescue or
  - dropping supplies in a search and rescue operation
- the helicopter is
  - operated by, or for the purposes of, the Australian Federal Police or the police force of a state or territory and
  - engaged in law enforcement operations or
- the pilot of the helicopter is engaged in an operation which requires the dropping of packages or other articles or substances in accordance with directions issued by CASA.
Over-water flights

AIP ENR 1.1

The pilot in command of the aircraft must not fly over water at a distance from land greater than the distance from which the aircraft could reach land if the engine, or, in the case of a multi-engine helicopter, the critical engine (being the engine the non-operation of which when the other engines are in operation gives the highest minimum speed at which the aircraft can be controlled) is inoperative (CAR 258).

Aircraft engaged in private, aerial work or charter operations, and which are normally prohibited by CAR 258 (the paragraph above) from over-water flights because of their inability to reach land in the event of engine failure, may fly over water subject to compliance with the conditions in the paragraphs below. These conditions are additional to the requirements for flight over land (AIP ENR 1.1).

In the case of helicopters, a fixed platform or a vessel suitable for an emergency landing may be considered acceptable for this requirement.

There is no limitation for private, aerial work or freight-only charter operations.

Each occupant of the aircraft must wear a life jacket during the flight over water unless exempted from doing so under the terms of CAO 20.11.

A meteorological forecast must be obtained.

**SAR alerting** AIP ENR 1.1

VFR flights are required to submit a SARTIME flight notification to ATS, or leave a flight note with a responsible person (AIP ENR 1.10).

VFR flights may choose to operate on reporting schedules for the over-water stages of a flight. Schedules may be arranged before commencing the over-water stage and terminate on completion of the crossing. Contact the Airservices Australia Help Desk (details below).

VFR aircraft not equipped with radio which will enable continuous communication, or not radio equipped, must carry a survival beacon (as prescribed in CAO 20.11), for the over-water stages of the flight.

**Airservices Australia Help Desk**

Telephone 1800 801 960

**Note**—Events that will initiate SAR action are described in AIP-GEN 3.6.
**Flotation systems**

Helicopters must be fitted with an approved flotation system unless exempted under the terms of CAO 20.11. The helicopter classes this requirement applies to include the following:

- single-engine helicopter engaged in passenger carrying charter operations;
- single-engine helicopter engaged in regular public transport operations; and
- multi-engine helicopter engaged in passenger carrying charter or regular public transport operations.

Helicopters operating in accordance with the approval given must comply with VFR, except that in the case of helicopters operating below 700 ft above water by day, the flight visibility must not be less than 5000 m and the helicopter must be flown at a distance equal to or greater than 600 m horizontally and 500 ft vertically from cloud, unless track guidance is provided by an approved operating radio navigation aid and the helicopter is equipped with a complementary radio navigation system.

**Life jackets**

Each occupant of a helicopter operating to or from an off-shore landing site located on a fixed platform or vessel shall wear a life jacket during the entire flight over water regardless of the class of operation or the one-engine-inoperative performance capability of the helicopter.

**Helicopter operations radio phraseology**

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air taxi or air transit for departure and arrival</td>
<td>(a) REQUEST AIR TAXI (or AIR TRANSIT or GROUND TAXI) FROM (or VIA) TO (location or routing as appropriate)</td>
</tr>
<tr>
<td></td>
<td>(b) Air taxi (or air transit or ground taxi) to (or via) (location, parking position, stand, or routing as appropriate) [caution (dust, loose debris, taxiing light aircraft, personnel, wake turbulence, etc)]</td>
</tr>
</tbody>
</table>

For the full helicopter radio phraseology refer AIP GEN 3.4-69
Section 5

Emergency procedures
The Australian Maritime Safety Authority (AMSA) is responsible for aviation and maritime search and rescue (SAR) in Australia and, each year, hundreds of lives are saved by SAR efforts. Many pilots have discovered that the comforting phrase ‘it can’t happen to me’ is far from correct. If you prepare adequately for all eventualities, you will improve your ability to deal with any emergency situation and thus enable AMSA to offer you better assistance.

To help you in this preparation, the following actions are recommended:

1. Select the route which gives you short legs (for example, every 15–20 minutes) between the best visual fixes rather than featureless land areas and avoid extensive areas of inhospitable, rugged terrain. Make sure that your maps cover the entire route. Remember that external navigation aids, such as GPS, should be cross-checked using other navigational methods to ensure their accuracy.

2. Always wear a watch.

3. If your planned flight crosses high country or large water expanses, plan alternative routes that could be used in adverse weather. Remember the problems of rising ground in deteriorating meteorological conditions.

4. Make sure you get a forecast. Take special note of the weather, freezing level, significant cloud cover and expected visibility. Relate the forecast to your planned route and the nature of the terrain.

5. Always tell someone what you are doing—either by lodging a flight plan or leaving a flight note. If the weather is not suitable, consider using an alternate route or postponing the flight. Discuss the situation with someone else with aviation experience.

6. If you are making a day VFR flight, plan to arrive at least 10 minutes before the end of daylight, or earlier if your flight time is more than one hour, or if the terrain or the weather could reduce the light. If you are delayed, make sure that your departure is not too late to meet this requirement.

7. Break your flight into route segments, measure distances carefully and use a computer to find time intervals. Do not guess or give just one time interval. Either lodge a flight plan or leave a flight note with a responsible person. Plan a realistic SARTIME and don’t forget to amend it if you are delayed for any reason. Provide a destination telephone number on your flight plan or flight note. Provide mobile phone numbers as well. Make sure you have sufficient fuel for the flight and unforseen contingencies.
Helping search and rescue

Should you have to make a forced landing, many of the planning hints mentioned previously will help AMSA find you quickly. This is because SAR operations may involve the following:

- the search will be planned according to the forecast and actual weather conditions
- the search will be based on the information you gave in your flight notification form or flight note, plus, (if necessary) the performance capabilities of your aircraft and
- the search pattern is based on track-spacing, which is determined during SAR operation briefings or by the assessed visual range of the day (for example, a search pattern may start 10 nm either side of your planned route).

Other things which you can do to help yourself and AMSA in emergency situations are:

- if practicable, for drawing attention from SAR personnel, remain near your aircraft after evacuating. Otherwise move to an area where SAR agencies will see your visual signals more easily (see also ‘Hints for survival’ on page 5.19) (ERSA EMERG)
- when moving, carry location aids for SAR, such as the following items (ERSA EMERG)
  - survival radios/beacons
  - heliograph or mirror to signal search aircraft by day
  - day/night flares
  - rockets
  - strobes or electric torches for use at night (heliographs are available at most army disposal stores or camping stores)
  - signal panels and
  - sea dye marker
- For making improvised aids, carry matches or a cigarette lighter, a pocket compass, knife and first aid kit, and wear warm clothing in winter (a space blanket is a cheap lightweight alternative to a blanket)
- always carry water, and take extra supplies if you are flying over hot arid areas and
- carry a ‘survival food kit’ of high calorie food items packed in a small waterproof container.
Note—Survival kits may be purchased or homemade. Research the most appropriate contents for your survival kit for the flight you are planning.

Remember: it can happen to you—but it need not be a tragedy

A pilot who does not hold an instrument rating, or who is flying an aircraft not equipped for instrument flight, has no place in adverse weather. However, there are many instances where VFR pilots can find themselves in weather below the VMC minima.

Such occurrences are generally the result of poor planning for safety and all too frequently end in tragedy.

VFR flight in weather which is below VMC is not permitted (CAR 172, AIP ENR 1.2).

Broadcast your intentions

When you become aware that any element of the weather is about to fall below the VMC minima—do not hesitate, turn back immediately. Broadcast your intentions. Do not leave your decision until the weather has already fallen below VMC minima.

Plan your immediate flight path so that you remain well clear of cloud and heavy rain at all times. There have been many occasions when pilots have not intended to fly into cloud but, through inadequate planning, their flight path has taken them into cloud.

Certified, registered and other aerodromes (including many ALAs) are shown on WACs, VTCs and VNCs. Note which aerodromes lie close to your track and which might be suitable for a precautionary landing.

Decide how and when you will determine a critical point en route where you will make a firm decision to either continue, turn back, divert on an alternate route or conduct a precautionary landing on a suitable nearby field if other options cannot be safely executed.

When weather begins to deteriorate, monitor the changes carefully, considering alternate actions and your time limits and critical points for decision making. For example, if you have already planned an alternative route to another suitable aerodrome, decide on a critical point in terms of time or position on track when to take an alternative action, whether to divert or, if no aerodrome is nearby, safely conduct a precautionary landing on a suitable field.
Distress beacons

Overview

A distress beacon is a small electronic device that, when activated in a life-threatening situation, assists rescue authorities in their search to locate those in distress. Distress beacons save lives and, moreover, carriage of distress beacons on some aircraft is required by law.

The following information will give you an understanding of how to use distress beacons and the different types available.

Carriage requirements

Unless the aircraft is exempt, the pilot in command of an Australian aircraft must carry either one of the following eligible emergency locator transmitters (ELT) in the aircraft (CAR 252A (1)):

- an approved fitted ELT or
- an approved portable ELT.

For the definition of an exempted aircraft, see page 5.5.
For the definition of an eligible ELT, see page 5.8.
For the definition of an approved ELT, see page 5.8.

CAR 252A (1) (above) does not apply in relation to a flight by an Australian aircraft that:

- is wholly within a radius of 50 nm from the aerodrome reference point of the aerodrome from which the flight is to begin
  - or is incidental to, an agricultural operation or
  - CASA has given permission for under CASR 21.197
- is for a purpose associated with manufacture, preparation or delivery of a new aircraft or
• is for the purpose of moving the aircraft to a place to have an approved ELT fitted to the aircraft, or to have an approved ELT that is fitted to it repaired, removed or overhauled.

In addition, CAR 252A (1) (above) does not apply in relation to a flight by an Australian aircraft if:

• an eligible ELT is usually carried in the aircraft, has been temporarily removed for inspection, repair, modification or replacement
• an entry has been made in the aircraft’s log book, or approved alternative maintenance record, stating
  – the ELT’s make, model and serial number
  – the date on which it was removed and
  – the reason for removing it
• a placard stating ‘ELT not installed or carried’ has been placed in the aircraft in a position where it can be seen by the aircraft’s pilot and
• not more than 90 days have passed since the ELT was removed.

**Exempted aircraft**

An exempted aircraft is one of the following:

• single-seat
• balloon
• airship
• glider
• high-capacity (with a maximum seating capacity greater than 38 seats or maximum payload greater than 4200 kg), either or
  – RPT or
  – charter
• turbojet-powered
Types of beacon

406 MHz beacons are either GPS or non-GPS capable. GPS 406 MHz beacons provide an encoded (GPS) location that enables the COSPAS-SARSAT satellite system to calculate the beacon's location much faster than for that of a non-GPS 406 MHz beacon.

There are three types of distress beacons:

- **Emergency locator transmitter (ELT)**—for use in aircraft;
- **Personal locator beacon (PLB)**—used by bushwalkers, drivers of cross-country vehicles, and other adventurers on the ground, as well as employees working in remote areas and crew in watercraft and aircraft and
- **Emergency position indicating radio beacons (EPIRB)**—normally used in ships and boats but also used in life rafts.

ELTs must operate continuously for at least 24 hours once activated. ELTs are usually fixed in the aircraft and are designed to activate on impact. However, PLBs or EPIRBs can be carried in an aircraft (other than the aforementioned ‘exempted’ aircraft) as an alternative to an ELT (see CAR 252A).

PLBs are designed for personal use in both land and marine environments. This type of beacon is becoming a multi-environment beacon. PLBs must also operate for a minimum of 24 hours once activated.

EPIRBs are designed to float in the water to optimise the signal to the satellite. An EPIRB must operate for a minimum of 48 hours continuously once activated. An EPIRB has a lanyard that is used to secure it to something that is not going to sink. There have been a number of incidents where vessels have sunk quickly and crew have not been able to deploy an EPIRB. In such incidents, float-free EPIRBs could have reduced response times and saved lives. Float-free EPIRBs are held in a bracket and fitted with a water-activated hydrostatic release, deploying the beacon automatically if the vessel sinks. If the vessel continues to float the EPIRB can be manually deployed.
Emergency beacons

Emergency position indicating radio beacon (EPIRB)
Emergency locator transmitter (ELT)
Personal locator beacon (PLB)
Search and rescue (SAR)

Types of beacon

- 406 MHz
- SAR
- GEOS INSAT
- GOES
- MSG
- COSPAS SARSAT
- LEO satellites
- GEO satellites
- Downlink
- Local user terminal (LUT)
- Mission control centre (MCC)
- Rescue coordination centre (RCC)

EPIRB
ELT
PLB
SAR
**ELTs**

The following ELTs must meet the specified requirements to be an eligible ELT for use on an aircraft:

### Eligible ELTs

<table>
<thead>
<tr>
<th>ELTs</th>
<th>Requirements to be eligible</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency MHz</td>
</tr>
<tr>
<td>ELT</td>
<td>406–406.1, 121.5</td>
</tr>
<tr>
<td>EPIRB</td>
<td></td>
</tr>
<tr>
<td>PLB</td>
<td></td>
</tr>
</tbody>
</table>

For an ELT to be an approved ELT for the use on aircraft, it must be an eligible ELT and also meet the following requirements:

### Approved ELTs

<table>
<thead>
<tr>
<th>Eligible ELTs</th>
<th>Requirements to be approved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stowage</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>ELT</td>
<td>Fitted into the aircraft with a switch set to ‘armed’ if so marked</td>
</tr>
<tr>
<td>EPIRB</td>
<td>Portable and carried in a place readily accessible to crew</td>
</tr>
<tr>
<td>PLB</td>
<td></td>
</tr>
</tbody>
</table>
Operation

The COSPAS-SARSAT system

Operational use of the COSPAS-SARSAT system by SAR agencies started with the crash of a light aircraft in Canada on 10 September 1982, from which three people were rescued. Since then, the system has been instrumental in the rescue of over 35,000 lives in more than 9600 incidents worldwide.

The basic COSPAS-SARSAT concept is illustrated on page 5.7. The system is composed of:

- distress beacons (ELTs, PLBs, EPIRBs)
- instruments on board geostationary earth orbit (GEO) and low-altitude earth orbit (LEO) satellites, which detect the signals transmitted by distress beacons
- Local users terminals (LUT) are ground receiver stations which receive and process the satellite downlink signal to generate distress alerts and
- Mission control centres (MCC), which receive alerts produced by LUTs and forward them to rescue coordination centres (RCC), search and rescue points of contact (SPOC) or other MCCs.

The COSPAS-SARSAT system includes two types of satellites:

- satellites in LEO which form the LEOSAR system and
- satellites in GEO which form the GEOSAR system.

The future COSPAS-SARSAT system will include a number of a new type of satellite in medium-altitude earth orbit (MEO), which will form the MEOSAR system.

COSPAS-SARSAT has demonstrated that the GEOSAR and LEOSAR system capabilities are complementary. For example, the GEOSAR system can provide almost immediate alerting in the footprint of the GEOSAR satellite, whereas the LEOSAR system:

- provides coverage of the polar regions (which are beyond the coverage of GEO satellites)
- can calculate the location of distress events using doppler processing techniques
- is less susceptible to obstructions which may block a beacon signal in a given direction because the satellite is continuously moving with respect to the beacon.
RCC Australia’s usage of the COSPAS-SARSAT system

The COSPAS-SARSAT system only detects and locates distress beacons operating at 406 MHz.

Note—Processing of 121.5 MHz and 243 MHz signals by COSPAS-SARSAT ceased on 1 February 2009.

Consequently, over-flying aircraft are the only means of detecting activated analogue beacons. In some areas within the Australian search and rescue region this could mean it would take days rather than hours before a 121.5 MHz beacon could be heard. In some circumstances, the 121.5 MHz beacon may not be detected at all. Not all aircraft ‘listen’ to the 121.5 MHz frequency and those that do are generally very high flyers. As a consequence, the search area resulting from these detections could be very large and it would take rescue authorities considerable time and resources to localise the distress signal. This would also apply to distress beacons activated directly under a high air-traffic density flight path.

Australian LUTs are controlled by the MCC at RCC-Australia in Canberra. There are three LUTs in the Australian region:

- Albany (WA)
- Bundaberg (QLD) and
- Wellington (NZ).

 Alerts from 406 MHz distress beacons can be received and processed by GEO satellites and passed to RCC Australia within minutes. If the beacon has GPS capability a very accurate position transmitted with the alert. Non-GPS beacons require detection by a polar earth orbit (POE) satellite before a position can be obtained.

Activation

A distress beacon with an encoded (GPS) location is usually detected by the RCC and located within minutes. Distress beacons without the capability to provide an encoded position also provide an initial alert to the RCC within minutes, but there will be no associated position. If emergency contacts are aware of trip details or trip details have been submitted online, search operations can begin sooner. If the RCC has to rely on POE satellites to determine the location of a beacon, it will take longer to gain an accurate position thereby delaying search operations.
Accidental activation

If a beacon is inadvertently activated, the most important thing to do is to switch it off and contact RCC Australia as soon as possible to ensure a search and rescue operation is not commenced. There is no penalty for inadvertent activations.

**RCC Australia**
Telephone 1800 641 792

Registration

Importance of registration

It is crucial that 406 MHz distress beacons are registered in recognised beacon registration databases that are accessible to SAR authorities at all times. The information contained in these databases concerning the beacon, its owner, and the vehicle/vessel on which the beacon is mounted is vital for deploying SAR resources effectively. The proper registration of a beacon could make the difference between life and death.

Registration is free and can result in a more efficient SAR effort. Digital 406 MHz distress beacons transmit a unique code identifying that particular beacon when it is activated.

A registered 406 MHz beacon will allow the AMSA’s RCC to access the registration database and find contact details; details of registered vessels, aircraft or vehicles; and details of up to three emergency contacts who can be contacted if necessary. These emergency contacts could provide valuable information to the RCC to help with a rescue.

Beacon registration is valid for two years.
## How to register

You can now register your beacon online on the AMSA website (see details below). You can renew your registration either online or by calling 1800 406 406.

Beacon owners have protected access to their accounts and are able to update their details any time, including changes to:

- ownership and emergency contact details
- boat, aircraft or vehicle details
- registered address details or
- indicate the disposal of a beacon.

There is also a facility for owners to note trip itineraries, so when a beacon is activated the RCC will have access to your current movements and be better placed to organise the most suitable response.

This does not replace advising a responsible person of your trip details. As well as online access, you can also provide registration forms and changes to details to AMSA by facsimile, email or by post (see details below).

If you sell your distress beacon or it is lost, stolen or destroyed please notify AMSA. If AMSA is not notified and the new owner activates the beacon any rescue will be delayed as the last known registered owner will be contacted. Notification of sold, lost, stolen or destroyed distress beacons can be made online (see details below).

### AMSA registration

Australian 406 Distress Beacon Register  
Australian Maritime Safety Authority  
GPO Box 2181, Canberra ACT 2601  
t: 1800 406 406  
f: (within Australia) 1800 406 329, (international) +61 (0)2 9332 6323  
e: ausbeacon@amsa.gov.au

### Usage

Distress beacons should only be used when there is a threat of grave and imminent danger. In the event of an emergency, communication should first be attempted with others close by using radios, phones and other signalling devices. Mobile phones can be used but should not be relied upon as they can be out of range, have low batteries or water-damage.
Testing

Self-test function

All COSPAS-SARSAT type approved 406 MHz beacons include a self-test mode.

All 406 MHz distress beacons can be tested at any time using the self-test functions without any notification to RCC Australia.

The self-test function performs an internal check and indicates that RF power is being emitted at 406 MHz and at 121.5 MHz, as applicable. The beacon will provide an indication of the success or failure of a GNSS self-test.

The self-test mode signal is not processed by the satellite equipment.

Operational testing and remote cockpit activations

While a functional test of a beacon can be performed via the beacon’s self-test capability the use of the remote aircraft cockpit activation switches results in operational activation of the ELT. Remote cockpit activations are performed on initial installation and during ongoing maintenance of the ELT.

In order to comply with these ELT maintenance requirements, operational testing of a 406 MHz ELT from the cockpit of an aircraft may be undertaken by maintenance facilities, provided the test duration is no longer than five seconds and is undertaken within the first five minutes of the hour. RCC Australia (see below) and the ATS centre for the location of the test must be advised of this operational test.

The test duration must be restricted to five seconds so that there is no potential for an operationally coded 406 MHz digital burst transmitting and thus generating a false alert. The duration of the 121.5/243 MHz homing transmission, which will also be activated as part of this test, must also be restricted so as not to generate false alerts via ATS.

RCC Australia

t: 1800 641 792
Emergency activation

**Activation procedures** ERSA EMERG

If you are forced down, activate the ELT immediately.

Where an ELT is permanently installed, and you are unable to confirm that it has activated automatically, activate the ELT manually, for example, by switching to the on or active position.

Where a portable distress beacon is being used, if possible, select an elevated site, clear of trees, boulders etc, and reasonably close to the aircraft.

Place the beacon on the ground on an earth mat. If an earth mat is not available, place the ELT on the wing of the aircraft or other reflective metal surface.

Secure the ELT with rocks, sticks, tape etc, so that the antenna remains vertical. Prevent anything touching the antenna as this will degrade ELT performance.

**Note**—A beacon which is damaged or under wreckage can still transmit some signal so always activate it.

**Do not switch off the beacon unless rescue is no longer required.**

To avoid confusing direction-finding equipment on search aircraft, avoid activating two or more beacons within 1 nm of each other. If two or more beacons are available, their use should be rationalised to extend the alerting period.

In the event of a search, an aircraft may drop a radio to you. Before using the radio walk away from the beacon to avoid interference on the radio transmission frequency.
**Water activation**

If you are in the water and the beacon is water buoyant, it should be activated in the water and allowed to float to the end of the lanyard with the antenna vertical. Do not hoist the ELT up a mast. The performance of an ELT can degrade if it is raised above the water surface.

Do not attach the lanyard to the aircraft, but rather attach it to a person or life raft. Keep the distress beacon vertical, with the antenna pointing skyward.

In situations where you are forced to use a distress beacon that is not certified for use in water, ensure that the beacon is kept dry. The beacon should operate successfully from inside a plastic bag.

**Land activation**

For operations over land you will get the best performance from a distress beacon operating from its permanent installation in the aircraft or on the ground on an earth mat.

A simple inexpensive earth mat can be made by taping household aluminium foil into a 120 cm square. It is suggested that, if you carry a distress beacon you make a foil earth mat, fold it and tape it to your distress beacon. To use the earth mat, unfold it and place it flat on the ground, holding the edges down with rocks or earth. Switch on your distress beacon and place in the centre of the earth mat.

Alternatively, place the distress beacon on the wing of the aircraft.

In many cases, using an earth mat will increase the effective range of your portable ELT by 50 per cent.
Emergency signals

**Transmission of signals** CAR 191

The pilot in command of an aircraft transmits or displays the signals specified according to the degree of emergency being experienced.

The signals specified in relation to each successive degree of emergency can be sent separately or together for any one degree of emergency.

**Distress signals** CAR 192

The distress signal shall be transmitted only when the aircraft occupants are threatened with grave and immediate danger and require immediate assistance.

The distress signal shall take the form of:

- **By radiotelegraphy:**
  
  the group SOS (· · · − − − · · · ) sent three times, followed by the group DE sent once, followed by the **callsign of the aircraft** sent three times.

  The signal specified above may be followed by the automatic alarm signal which consists of **a series of 12 dashes** sent in one minute, the duration of each dash being four seconds, and the duration of the interval between consecutive dashes being one second.

- **By radiotelephony:**
  
  the word ‘Mayday’ repeated three times, followed by ‘This is’, followed by the **callsign of the aircraft** repeated three times.

- **By one or more of the following means:**
  
  - the Morse signal · · · − − − · · · with visual apparatus or with sound apparatus;
  - a succession of pyrotechnic lights, fired at short intervals, each showing a **single red light**
  - the two-flag signal corresponding to the letters NC of the International Code of Signals
  - the distant signal, consisting of a square flag having, either above or below it, a ball or anything resembling a ball
  - a parachute flare showing a red light and/or
  - a gun or other explosive signal fired at intervals of approximately one minute
  - squawk transponder code 7700.
Urgency signals CAR 193

The following signals, either together or separately, shall be used by an aircraft for the purpose of giving notice of difficulties which compel it to land without requiring immediate assistance:

- the repeated switching on and off of the landing lights
- the repeated switching on and off of the navigation lights, in such a manner as to be distinctive from the flashing lights described below and/or
- a succession of white pyrotechnic lights.

The following signals, either together or separately shall be used by an aircraft for the purpose of giving notice that the aircraft has a very urgent message to transmit concerning the safety of a ship, aircraft or vehicle, or of some person on board or within sight:

- **By radiotelegraphy:**
  
  the group XXX ( – · · –  – · · –  – · · – ) sent three times, with the letters of each group, and the successive groups, clearly separated from each other, and sent before the transmission of the message.

- **By radiotelephony:**
  
  the words ‘Pan-Pan’ sent three times before the transmission of the message. It is also correct to use Pan-Pan if relaying a Mayday call from another aircraft or station that is out of range.

- **By one or more of the following means:**
  
  – a succession of green pyrotechnic lights and/or
  – a succession of green flashes with signal apparatus.

Safety signals CAR 194

The safety signal shall be transmitted when an aircraft wishes to transmit a message concerning the safety of navigation or to give important meteorological warnings.

The safety signal shall be sent before the call and shall consist of:

- **By radiotelegraphy:**
  
  the group TTT ( – – – ) sent three times, with the letters of each group and the successive groups clearly separated from each other.

- **By radiotelephony:**
  
  the word ‘Security’ repeated three times.
# Forced landings

## Initial action

<table>
<thead>
<tr>
<th>Initial check</th>
<th>Field selection</th>
<th>FMOST</th>
<th>Mayday call and squawk 7700</th>
<th>Brief your passengers</th>
<th>Final actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Altitude</strong></td>
<td><strong>Wind</strong></td>
<td><strong>Fuel</strong></td>
<td><strong>Mayday Mayday Mayday</strong></td>
<td><strong>Brief your passengers</strong></td>
<td><strong>Fuel</strong></td>
</tr>
<tr>
<td>Hold</td>
<td>Determine direction</td>
<td>Check contents</td>
<td>Melbourne Centre</td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td><strong>Speed</strong></td>
<td><strong>Surroundings</strong></td>
<td>Pump on</td>
<td>This is ZFR ZFR ZFR</td>
<td>Mixture</td>
<td>Closed</td>
</tr>
<tr>
<td>Best glide speed</td>
<td>Power lines, trees</td>
<td>Primer on</td>
<td>Engine failure</td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td><strong>Mixture</strong></td>
<td><strong>Size and Shape</strong></td>
<td>Rich</td>
<td>3 nm west of Picton 4500 ft</td>
<td>Harness</td>
<td>Tight</td>
</tr>
<tr>
<td>Rich</td>
<td>In relation to wind</td>
<td>Up and down range, leave rich</td>
<td>Landing in paddock</td>
<td>Door</td>
<td>As required</td>
</tr>
<tr>
<td><strong>Carb</strong></td>
<td><strong>Surface and Slope</strong></td>
<td>Oil</td>
<td>Plus any other useful information such as POB</td>
<td>Master switch</td>
<td>Off</td>
</tr>
<tr>
<td>Full hot</td>
<td>Close proximity if possible</td>
<td>Temps green</td>
<td></td>
<td>Caution if flaps are electrically operated</td>
<td></td>
</tr>
<tr>
<td><strong>Fuel</strong></td>
<td><strong>S(c)ivilisation</strong></td>
<td>Pressures green</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On</td>
<td>Close proximity if possible</td>
<td>Left then right back to both</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Trim</strong></td>
<td><strong>Throttle</strong></td>
<td>Switch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To best glide speed</td>
<td>Up and down range, then close</td>
<td>Left then right back to both</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 4 Mayday call and squawk 7700

Mayday Mayday Mayday
Melbourne Centre
This is ZFR ZFR ZFR
Engine failure
3 nm west of Picton 4500 ft
Landing in paddock
Plus any other useful information such as POB

### 5 Brief your passengers

Mayday Mayday Mayday
Melbourne Centre
This is ZFR ZFR ZFR
Engine failure
3 nm west of Picton 4500 ft
Landing in paddock
Plus any other useful information such as POB

### 6 Final actions

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Mixture</th>
<th>Mags</th>
<th>Harness</th>
<th>Door</th>
<th>Master switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Closed</td>
<td>Off</td>
<td>Tight</td>
<td>As required</td>
<td>Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Caution if flaps are electrically operated</td>
</tr>
</tbody>
</table>
Hints for survival

It is much easier for an aerial search to spot an aircraft than a walking survivor, and this applies whether your aircraft is still in one piece or not.

However, there are two exceptions to this rule:

- If your aircraft is completely hidden from sight by trees or undergrowth, try to find a clearing where you can set up signals for search aircraft; and

- If you are absolutely certain that a town, settlement, road or homestead is within reasonable distance, you could walk out—but if you do, leave notes for a land search party telling them what you are doing and leave a trail which they can follow (see Signal codes, page 5.22).
Water

In a survival situation, salvage your water supply, conserve it as much as possible and augment it if you can, by rain, dew, river water or any other means. For example, dig down in the middle of the sandy bed of a watercourse to locate a soak, or distil salt water by holding a cloth in the steam of boiling water and wringing it into a container.

Water is more important to survival than food—you can comfortably do without food for 48 hours or more, but lack of water causes dehydration and you can lose no more than one-fifth of the body’s fluids (about 11 litres) if you are to survive.

Under desert survival conditions, the preferred method after a forced landing is to wait until you are extremely thirsty before drinking at all, and then to drink at the rate at which sweating is taking place. This method ensures there is little impairment in efficiency and wastes no water. You can also save water by reducing sweating; for example, by keeping in the shade, not exposing the skin to sun or hot winds and resting during the day. If water supplies have to be restricted, do not take salt or eat salty foods.

Do not drink urine under any circumstances.

Minimum water requirements

<table>
<thead>
<tr>
<th>Mean temperature*</th>
<th>35 °C</th>
<th>32 °C</th>
<th>30 °C</th>
<th>&lt; 27 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Litres per 24 hours†</td>
<td>5</td>
<td>3.5</td>
<td>2.5</td>
<td>1</td>
</tr>
</tbody>
</table>

* Mean temperature is usually about 8°C below daily maximum.
† Minimum water requirements per person to maintain the correct balance of body fluid, when resting in the shade

If you decide to walk out you will double your body’s need for water.

In desert or semi-desert areas, walk only at night or in the early morning.

For every 4.5 L of water carried, you should be able to walk 32 km at night in these types of terrain.

Do not drink salt water.
Emergency water still

To supplement supplies, you can carry some basic equipment to setup an emergency water still, which can extract small amounts of water even from soil that looks quite dry.

Foliage (if available) should be placed as illustrated around the container under the plastic sheet. Clear polythene, which ‘wets’ easily is best for the purpose but ordinary clear kitchen polythene sheet (or preferably the thicker 100 μm variety such as is laid down before concrete floors etc. are poured) is satisfactory, particularly if its surface is roughened so that the droplets of water will cling to it more easily and will not be wasted by dropping off before they run down to the point of the cone. It is wise to cut the sheets to size and roughen them with sandpaper before you store them in the aircraft, rather than waiting until you are stranded somewhere in the outback. If a ‘nesting’ set of containers is obtained and the sheets and tubing rolled inside them, a very compact bundle can be made. But see that it is very well wrapped—it may lie around in the luggage compartment for a long time before it is needed.

Emergency water still

---

**Emergency procedures – Forced landings – Hints for survival**

Emergency water still

- **Dirt to anchor plastic sheet**
- **Plastic drinking tube**
- **One or two litre container**
- **Plastic sheet**
- **Rock**

Dimensions:
- 1 m
- 500 mm

---

**Emergency water still**

- **Dirt to anchor plastic sheet**
- **Plastic drinking tube**
- **One or two litre container**
- **Plastic sheet**
- **Rock**

Dimensions:
- 1 m
- 500 mm

---

**Emergency procedures – Forced landings – Hints for survival**
Signalling

If you have a locator beacon, operate it as described in Distress beacons – Emergency activation on page 5.14.

Collect wood, grass, etc and build several signalling fires – preferably in the form of a triangle. Use oil from the engine and tyres to make black smoke. Unless there is ample firewood in the area, do not light fires until you hear or see search aircraft, or until desperate. Be careful to have a fire break between the fires and your aircraft. Try to have the fires downwind from the aircraft.

Conserve your batteries if the aircraft radio is undamaged. After one attempt to contact an airways operations unit, do not use your transmitter until you hear or see search aircraft. Maintain a listening watch, as search aircraft may broadcast information or instructions in the hope that you can receive. Make a note of (and call on) the overlying controlled airspace frequency. Watch for contrails.

Make signals on the ground using the SAR Ground Signals below and in ERSA-EMERG.

Aircraft may fly over your notified route on the first or second night. Light the fires as soon as you hear them and, if possible, keep them burning all night.

If you do not have a heliograph or a mirror, try to remove some bright metal fittings from your aircraft for signalling—any flash seen by searching aircraft will be investigated.

Ground—Air visual signal code

<table>
<thead>
<tr>
<th>Message</th>
<th>Code signal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>For use by survivors</strong></td>
<td></td>
</tr>
<tr>
<td>1 Require assistance</td>
<td>V</td>
</tr>
<tr>
<td>2 Require medical assistance</td>
<td>X</td>
</tr>
<tr>
<td>3 Proceeding in this direction</td>
<td>➔</td>
</tr>
<tr>
<td>4 Yes or affirmative</td>
<td>Y</td>
</tr>
<tr>
<td>5 No or negative</td>
<td>N</td>
</tr>
<tr>
<td>If in doubt use international symbol</td>
<td>SOS</td>
</tr>
<tr>
<td><strong>For use in civil emergencies</strong></td>
<td></td>
</tr>
<tr>
<td>1 Require fodder</td>
<td>FF</td>
</tr>
<tr>
<td>2 Require evacuation</td>
<td>III</td>
</tr>
<tr>
<td>3 Power failure</td>
<td>VI</td>
</tr>
</tbody>
</table>
Hygiene

To remain in reasonable condition, you should take as much care as possible to avoid accidents or illness. The following hints may help:

- keep your body and clothes as clean as possible
- always wash your hands before eating
- properly dispose of body wastes, garbage, etc, in trenches
- if possible, sterilise or boil water and cook food to avoid gastric troubles
- avoid activities which may lead to injury
- keep your clothing dry
- keep your head covered when in the sun and
- do not sleep on the ground—make a raised bed with aircraft seats, wood, dry leaves etc.

Shelter

Some type of shelter is essential regardless of the type of terrain in which you find yourself.

If your aircraft is not badly damaged, it can be used as a shelter. Otherwise, you should use whatever is available from the aircraft the environment. For example, use trees to rig up a temporary tent as protection against the weather.

Fires

You may find that a fire is essential for warmth, cooking, drying clothes, distilling or purifying water. If there is plenty of wood available, this should prove no problem. Otherwise you may have to improvise a stove from a can or other container. Fuel for such a stove could be oil or fat, using a wick, or petrol and a 75 mm layer of fuel-impregnated sand.
Communication failure

Procedures

In the event of communication failure:

- maintain terrain clearance throughout all procedures and
- squawk 7600 if in CTA or a restricted area.

Indications by an aircraft *ERSA EMERG*:

In flight:

- during the hours of daylight—by rocking the aircraft wings and
  
  Note—This signal should not be expected on the base and final legs of the approach.

- during the hours of darkness—by flashing the aircraft’s landing lights on and off twice or, by switching its navigation lights on and off twice.

On the ground:

- during the hours of daylight—by moving aircraft’s ailerons or rudder; and
- during the hours of darkness—by flashing the aircraft’s landing lights on and off twice or, by switching its navigation lights on and off twice.

If VFR in Class G airspace *ERSA EMERG*:

- stay in VMC
- broadcast intentions (assume transmitter is operating and prefix calls with ‘Transmitting blind’)
- remain VFR in Class G and land at the nearest suitable location and
- report arrival to ATS if on SARTIME or reporting schedules (see telephone number below).

**SAR**

**t:** 1800 815 257
If in controlled/restricted airspace **ERSA EMERG:**

- squawk 7600 if transponder equipped. Listen out on ATIS and/or voice modulated NAVAIDS and
- transmit intentions and make normal position reports (assume transmitter is operating and prefix calls with ‘Transmitting blind’) then

If in VMC and certain of maintaining VMC:

- stay in VMC and land at the most suitable aerodrome (note special procedures if proceeding to a Class D aerodrome) and
- report arrival to ATS.

**Notes**

1. Initial and subsequent actions by the pilot at the time of loss of communications will depend largely on the pilot’s knowledge of the destination aids, the air traffic/air space situation and meteorological conditions en route and at the destination. It is not possible to publish procedures that cover all radio failure circumstances. The following procedures ensure that air traffic services and other traffic should be aware of the pilot’s most likely actions. Pilots should follow these procedures unless strong reasons dictate otherwise.

2. In determining the final level to which a pilot will climb after radio failure, ATC will use the level provided on the flight notification, or the last level requested by the pilot and acknowledged by ATC.

**Initial actions**

If no clearance limit received and acknowledged:

- proceed in accordance with the latest ATC route clearance acknowledged and climb to planned level or

If a clearance limit involving an altitude or route restriction has been received and acknowledged:

- maintain last assigned level (or minimum safe altitude if higher), for three minutes and/or
- hold at nominated location for three minutes then
- proceed in accordance with the latest ATC route clearance acknowledged, and climb to planned level.
If being radar vectored:
• climb if necessary to minimum safe altitude, to maintain terrain clearance and
• maintain last assigned vector for two minutes then
• proceed in accordance with the latest ATC route clearance acknowledged.

If holding:
• fly one more complete holding pattern then
• proceed in accordance with the latest ATC clearance acknowledged.

Destination procedures
If no NAVAID:
• track to the destination in accordance with the flight plan (amended by the latest ATC clearance acknowledged, if applicable)
• commence descent in accordance with standard operating procedures or flight plan
• proceed to overhead the aerodrome at that altitude
• ascertain landing direction
• descend to join desired circuit at circuit altitude via the downwind entry point (remain clear of other circuit)
• proceed with normal circuit and landing, maintaining separation from other aircraft
• watch tower for light signals (see page 5.27) (CAAP 166-01) or

If your aircraft is fitted with NAVAID:
• if possible, select the appropriate frequency and listen for instructions (generally speaking this is one of the most effective ways of proceeding safely)
• when the control tower is active, follow normal procedure
• watch tower for light signals (see page 5.27).
Light signals

<table>
<thead>
<tr>
<th>On ground</th>
<th>Light mode</th>
<th>In flight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorised to take-off if pilot is satisfied that no collision risk exists</td>
<td>Green</td>
<td>Authorised to land if pilot is satisfied that no collision risk exists</td>
</tr>
<tr>
<td>Authorised to taxi if pilot is satisfied that no collision risk exists</td>
<td>Green flashing</td>
<td>Return for landing</td>
</tr>
<tr>
<td>Stop</td>
<td>Red</td>
<td>Give way to other aircraft</td>
</tr>
<tr>
<td>Taxi clear of landing area</td>
<td>Red flashing</td>
<td>Do not land</td>
</tr>
<tr>
<td>Return to starting point on aerodrome</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Communication and NAVAID failure

In the event of complete failure of communications and navigation aids, maintain terrain clearance throughout all procedures and proceed as follows:

If VFR in Class G airspace:
- stay in VMC
- broadcast intentions (assume transmitter is operating and prefix calls with ‘Transmitting blind’)
- remain VFR in Class G and land at the nearest suitable aerodrome;
- report arrival to ATS if on SARTIME or reporting schedules or

If in controlled/restricted airspace or if IFR in any airspace:
- squawk 7600 if possible
- listen out on ATIS and/ or voice-modulated NAVAIDS
• transmit intentions and normal position reports (assume transmitter is operating and prefix calls with ‘Transmitting blind’
• if practicable leave/avoid controlled/restricted airspace and areas of dense traffic
• as soon as possible establish visual navigation
• land at the nearest suitable aerodrome
• report to ATS on arrival.

**Emergency change of level in controlled airspace procedures**

When it is necessary for an aircraft in controlled airspace to make a rapid change of flight level or altitude because of technical trouble, severe weather conditions, or other reasons, the change will be made as follows, using urgency message format, stating level changes involved and diversions, if applicable.

Calls/actions when conducting emergency change of level:

• squawk SSR code 7700
• transmit:
  ‘Pan-Pan, Pan-Pan, Pan-Pan’
  [agency being called]
  [aircraft identification]
  [nature of urgency problem]
  [intention of person in command]
  [present position flight level or altitude and heading]
  [any other useful information]
Mercy flights

**Mercy flight declaration** AIP ENR 1.1

When an urgent medical, flood or fire relief or evacuation flight is proposed in order to retrieve a person from grave and imminent danger and failure to do so is likely to result in loss of life or serious or permanent disability and the flight will involve irregular operations, a mercy flight must be declared.

A mercy flight must only be declared by the pilot in command and the factors/risks that the pilot in command must consider in the declaration, commencement and continuation of the flight are detailed in AIP ENR 1.1.

A flight must not be declared a mercy flight when:

- it can comply with the applicable regulations and orders or
- operational concessions to permit the anticipated irregular operations can be obtained.

In these cases, the flight should be notified as **SAR, MED, HOSP** or **FFR**. Special consideration or priority will be granted by ATC if necessary.

A mercy flight must not be undertaken when:

- alternative means of achieving the same relief are available
- the crew and other occupants of the aircraft involved will be exposed to undue hazards or
- relief or rescue can be delayed until a more suitable aircraft or more favourable operating conditions are available.

In assessing the justification of risks involved in a mercy flight, the pilot in command must consider the following:

- the availability of alternative transport or alternative medical aid
- the weather conditions en route and at the landing place/s
- the distance from which it should be possible to see the landing place/s
- the air distance and the type of terrain involved
- the navigation facilities available and the reliability of those facilities (such facilities may include landmarks)
- the availability of suitable alternate aerodromes
• the availability and reliability of communications facilities
• the asymmetric performance of the aircraft
• whether the pilot’s experience reasonably meets the requirements of the mercy flight
• the effect on the person requiring assistance if the flight is delayed until improved operating conditions exist
• whether the flight is to be made to the nearest or most suitable hospital and
• the competence of the authority requesting the mercy flight.

The pilot in command of a mercy flight must:

• give flight notification as required for a charter flight and identify the flight by the term ‘Mercy flight’. This notification must include the reason for the mercy flight and reference any rule or regulation which will not be complied with
• specify reporting points or times when contact will be made
• specify the special procedures intended or special assistance required of the ground organisation and
• limit the operating crew and the persons carried in the aircraft to the minimum number required to conduct the flight.

If the mercy flight applies only to a portion of the flight this must be stated in the flight notification. If a normal flight develops into a mercy flight, the pilot in command must take appropriate action.
Are you flying blind?

Procedures, regulations and airspace boundaries change regularly. Some may have changed since this guide was published.

**Do not use this guide as your sole source of information. If you do, you’re flying blind.**

**Always use current operational charts and documents.**

Aeronautical Information Publication (AIP) or Australian Airway Manual

*En Route Supplement Australia (ERSA)* or Australian Airway Manual

Visual Terminal Charts (VTC)

NOTAM.

To order AIP, ERSA and VTC, contact:

Airservices Publications Centre on 1300 306 630

To order the Australian Airway Manual, contact:

Jeppesen on (02) 6120 2999

To download updates of this guide, visit:

vfrg.casa.gov.au
# Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>Aerodrome</td>
<td>A defined area of land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and movement of aircraft.</td>
</tr>
<tr>
<td>Aerodrome beacon</td>
<td>An aeronautical beacon used to indicate the location of an aerodrome from the air.</td>
</tr>
<tr>
<td>Aerodrome control service</td>
<td>ATC service for aerodrome traffic.</td>
</tr>
<tr>
<td>Aerodrome control tower</td>
<td>A unit established to provide ATC service to aerodrome traffic.</td>
</tr>
<tr>
<td>Aerodrome elevation</td>
<td>The elevation of the highest point of the landing area.</td>
</tr>
<tr>
<td>Aerodrome meteorological minima (ceiling and visibility minima)</td>
<td>The minimum heights of cloud base (ceiling) and minimum values of visibility which are prescribed in pursuance of CAR 257 for the purpose of determining the useability of an aerodrome either for take-off or landing.</td>
</tr>
<tr>
<td>Aerodrome proprietor</td>
<td>Any owner, licensee, authority, corporation, or any other body which has a legal responsibility for a particular aerodrome.</td>
</tr>
<tr>
<td>Aerodrome reference point (ARP)</td>
<td>The designated geographical location of an aerodrome.</td>
</tr>
<tr>
<td>Aerodrome traffic</td>
<td>All traffic on the manoeuvring area of an aerodrome and all aircraft flying in, entering, or leaving the traffic circuit.</td>
</tr>
<tr>
<td>Aerodrome traffic circuit</td>
<td>The specified path to be flown by aircraft flying in, entering, or leaving the traffic circuit.</td>
</tr>
<tr>
<td>Aeronautical beacon</td>
<td>An aeronautical ground light visible at all azimuths, either continuously or intermittently, to designate a particular point on the surface of the Earth.</td>
</tr>
<tr>
<td>Aeronautical Information Circular (AIC)</td>
<td>A notice containing information that does not qualify for the origination of a NOTAM, or for inclusion in the AIP, but which relates to flight safety, air navigation, technical, administrative or legislative matters.</td>
</tr>
<tr>
<td>Aeronautical Information Publication (AIP)</td>
<td>A publication issued by or with the authority of a state and containing aeronautical information of a lasting character essential to air navigation.</td>
</tr>
<tr>
<td>AIP supplement (SUP)</td>
<td>Temporary changes to the information contained in the AIP which are published by means of special pages.</td>
</tr>
<tr>
<td>Aircraft classification number (ACN)</td>
<td>A number expressing the relative effect of an aircraft on a pavement for a specific standard sub-grade category.</td>
</tr>
<tr>
<td>Aircraft parking position taxi lane</td>
<td>A portion of an apron designated as a taxiway and intended to provide access to aircraft parking positions only.</td>
</tr>
<tr>
<td>Air-ground communications</td>
<td>Two-way communications between aircraft and stations on the surface of the Earth.</td>
</tr>
</tbody>
</table>
### Airprox
The combination of the two words, air and proximity. An occurrence in which aircraft come into such close proximity that a threat to the safety of the aircraft exists or may exist, in airspace where the aircraft are not subject to an air traffic separation standard, or where separation is a pilot responsibility.

### Air report (AIREP)
A report from an aircraft in flight prepared in conformity with requirements for position and operational and/or meteorological reporting.

### Air taxiing
Movement of a helicopter/VTOL above the surface of an aerodrome, normally in ground effect and at a speed normally less that 20 kt.

### Air traffic control clearance
Authorisation for aircraft to proceed under conditions specified by an air traffic control unit. Note—For convenience, the term ‘Air traffic control clearance’ is normally abbreviated to ‘Clearance’ when used in the appropriate context.

### Air traffic control instructions
Directives issued by air traffic control for the purpose of requiring a pilot to take a specific action.

### Air traffic control service
A service provided for the purpose of:
- preventing collisions:
  - between aircraft and
  - on the manoeuvring area between aircraft and obstructions and
- expediting and maintaining an orderly flow of air traffic.

### Air traffic service (ATS)
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).

### Air transit
The airborne movement of a helicopter that is:
- for the expeditious transit from one place within an aerodrome to another place within the aerodrome
- at or below 100 ft above the surface and
- at speeds greater than those used in air taxiing.

### Airways clearance
A clearance, issued by ATC, to operate in controlled airspace along a designated track or route at a specified level to a specified point or flight planned destination.

### Alerted see-and-avoid
A procedure where flight crew, having been alerted to the existence and approximate location of other traffic in their immediate vicinity, seek to sight and avoid colliding with those aircraft.

### Alerting post
An agency designated to serve as an intermediary between a person reporting an aircraft in distress and a rescue coordination centre.

### Alerting service
A service provided to notify appropriate organisations regarding aircraft in need of search and rescue aid, and to assist such organisations as required.

### Alternate aerodrome
An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing.
| **Altimeter setting** | A pressure datum which when set on the sub-scale of a sensitive altimeter causes the altimeter to indicate vertical displacement from that datum. A pressure-type altimeter calibrated in accordance with standard atmosphere may be used to indicate altitude, height or flight levels, as follows:
- when set to QNH or Area QNH it will indicate altitude
- when set to standard pressure (1013.2 HPa) it may be used to indicate flight levels. |
| **Altimeter setting region** | Airspace 10,000 ft and below where the sub-scale of a pressure sensitive altimeter is set to QNH or Area QNH. |
| **Altitude** | The vertical distance of a level, a point or an object, considered as a point, measured from mean sea level. |
| **Approach control service** | ATC service for arriving or departing flights. |
| **Approach sequence** | The order in which two or more aircraft are cleared to approach to land at the aerodrome. |
| **Apron** | A defined area on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail, cargo, fuelling, parking or maintenance. |
| **Apron service** | A traffic regulatory and information service provided to aircraft using the apron area of an aerodrome. |
| **Apron taxiway** | A portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron. |
| **Area control service** | Air traffic control service for controlled flights in control areas. |
| **Area navigation (RNAV)** | A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground or space-based navigation aids, or within the limits of the capability of self-contained aids, or a combination of these. |
| **Area navigation (RNAV) route** | An ATS route established for the use of aircraft capable of employing area navigation. |
| **Area QNH** | A forecast altimeter setting which is representative of the QNH of any location within a particular area. |
| **ATS route** | A specified route designed for channelling the flow of traffic as necessary for the provision of air traffic services. |
| **ATS surveillance service** | Term used to indicate an air traffic service provided directly by means of an ATS surveillance system. |
| **ATS surveillance system** | A generic term meaning variously, ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft.  
**Note**—A comparable ground-based system is one that has been demonstrated, by comparative assessment or other methodology, to have a level of safety and performance equal to, or better than, monopulse SSR. |
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic dependent surveillance – broadcast (ADS-B)</td>
<td>A means by which aircraft, aerodrome vehicles and other objects can automatically transmit or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link.</td>
</tr>
<tr>
<td>Automatic dependent surveillance – contract (ADS-C)</td>
<td>A means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports.</td>
</tr>
<tr>
<td>Automatic En Route Information Service (AERIS)</td>
<td>The provision of operational information en route by means of continuous and repetitive broadcasts.</td>
</tr>
<tr>
<td>Automatic Terminal Information Service (ATIS)</td>
<td>The provision of current, routine information to arriving and departing aircraft by means of continuous and repetitive broadcasts during the hours when the unit responsible for the service is in operation.</td>
</tr>
<tr>
<td>Aviation reference number (ARN)</td>
<td>A unique six-digit number used to identify a client who conducts business with CASA. When CASA receives an application for a new licence, certificate, or other service, an ARN is established and all subsequent transactions for the client are recorded against that ARN. In addition to being a client number, the ARN can also be the licence or certificate number. The ARN should be quoted in all correspondence with CASA or with the Airservices Publications unit.</td>
</tr>
<tr>
<td>Base turn (instrument approach)</td>
<td>A turn executed by the aircraft during the initial approach between the end of the outbound track and the beginning of the intermediate or final approach track. The tracks are not reciprocal. Base turns may be designated as being made either in level flight or while descending, according to the circumstances of each individual procedure.</td>
</tr>
<tr>
<td>Blind transmission</td>
<td>A transmission from one station to another station in circumstances where two-way communication cannot be established, but where it is believed that the called station is able to receive the transmission.</td>
</tr>
<tr>
<td>Block level</td>
<td>A section of airspace with specified upper and lower limits on a specific track, in which cleared aircraft are permitted to manoeuvre.</td>
</tr>
<tr>
<td>Break-out procedure</td>
<td>A procedure initiated on instruction from a precision runway monitor (PRM) controller upon which a pilot is required to discontinue an ILS approach and immediately commence a turn of approximately 90 degrees from the ILS course, climbing (or descending) as instructed by ATC, in response to an aircraft deviating from the adjacent ILS course.</td>
</tr>
<tr>
<td>Briefing</td>
<td>The act of giving in advance, specific pre-flight instructions or information to aircrew.</td>
</tr>
<tr>
<td>Broadcast</td>
<td>A transmission of information relating to air navigation for which an acknowledgement is not expected.</td>
</tr>
<tr>
<td>Ceiling</td>
<td>The height above the ground or water of the base of the lowest layer of cloud below 20,000 ft covering more than one-half of the sky.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
</tr>
<tr>
<td>CENSAR</td>
<td>An automated centralised SARTIME database software package used by ATS to manage SARTIMEs.</td>
</tr>
<tr>
<td>Centre</td>
<td>A generic call sign used in the en route and area environment which can include air traffic control, advisory, flight information and alerting services, depending on the classification of airspace in which the service is provided.</td>
</tr>
<tr>
<td>Circling approach</td>
<td>An extension of an instrument approach procedure which provides for visual circling of the aerodrome prior to landing.</td>
</tr>
<tr>
<td>Clearance limit</td>
<td>The point to which an aircraft is granted an air traffic control clearance.</td>
</tr>
<tr>
<td>Clearance expiry time</td>
<td>A time specified by an air traffic control unit at which a clearance ceases to be valid.</td>
</tr>
<tr>
<td>Clearway</td>
<td>A defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height.</td>
</tr>
<tr>
<td>Co-located navigation aids</td>
<td>En route way-points or navigation aids that are within 600 m of each other.</td>
</tr>
<tr>
<td>Common traffic advisory frequency (CTAF)</td>
<td>A designated frequency on which pilots make positional broadcasts when operating in the vicinity of a non-controlled aerodrome.</td>
</tr>
<tr>
<td>Communicable diseases</td>
<td>Communicable diseases include cholera, typhus (epidemic), smallpox, yellow fever, plague, and such other diseases as the contracting states shall, from time to time, decide to designate.</td>
</tr>
<tr>
<td>Company operations representative</td>
<td>The representative of an operating agency who is authorised to act in the capacity of liaison officer between ATC and the operating agency in respect of the control of an aircraft of that agency.</td>
</tr>
<tr>
<td>Control area (CTA)</td>
<td>A controlled airspace extending upwards from a specified limit above the Earth.</td>
</tr>
<tr>
<td>Controlled aerodrome</td>
<td>An aerodrome at which air traffic control service is provided to aerodrome traffic.</td>
</tr>
<tr>
<td>Controlled airspace</td>
<td>Airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification.</td>
</tr>
<tr>
<td>Controller</td>
<td>An air traffic controller, operating within an organisation approved under CASR Part 172 and qualified in accordance with CASR Part 65.</td>
</tr>
<tr>
<td>Controller pilot data link communications (CPDLC)</td>
<td>A means of communication between controller and pilot using data link for ATC communications.</td>
</tr>
<tr>
<td>Control zone (CTR)</td>
<td>A controlled airspace extending upwards from the surface of the Earth to a specified upper limit.</td>
</tr>
<tr>
<td>Cruise climb</td>
<td>An aeroplane cruising technique resulting in a nett increase in altitude as the aeroplane weight decreases.</td>
</tr>
<tr>
<td>Cruising level</td>
<td>A level maintained during a significant portion of a flight.</td>
</tr>
<tr>
<td><strong>Danger area</strong></td>
<td>An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Day</strong></td>
<td>That period of time from the beginning of morning civil twilight to the end of evening civil twilight.</td>
</tr>
<tr>
<td><strong>Dead reckoning (DR) navigation</strong></td>
<td>The estimating or determining of position by advancing an earlier known position by the application of direction, time and speed data.</td>
</tr>
<tr>
<td><strong>Decision altitude/height (DA/H)</strong></td>
<td>A specified altitude or height in the precision approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.</td>
</tr>
</tbody>
</table>

**Notes**

1. Decision altitude (DA) is referenced to mean sea level (MSL) and Decision height (DH) is referenced to the threshold elevation.

2. The ‘required visual reference’ means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path.

<table>
<thead>
<tr>
<th><strong>Density height</strong></th>
<th>An atmospheric density expressed in terms of height which corresponds to that density in the standard atmosphere.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Parallel Approaches</strong></td>
<td>Simultaneous instrument approaches to parallel or near-parallel instrument runways where ATS surveillance system separation minima between aircraft on adjacent extended runway centrelines are prescribed.</td>
</tr>
<tr>
<td><strong>Distance measuring equipment (DME)</strong></td>
<td>Equipment which measures in nautical miles, the slant range of an aircraft from the selected DME ground station.</td>
</tr>
<tr>
<td><strong>DME distance</strong></td>
<td>The slant range from the source of a DME signal to the receiving antenna.</td>
</tr>
<tr>
<td><strong>Domestic flight</strong></td>
<td>A flight between two points within the Australian FIR.</td>
</tr>
<tr>
<td><strong>Elevation</strong></td>
<td>The vertical distance of a point or a level, on or affixed to the surface of the Earth, measured from mean sea level.</td>
</tr>
</tbody>
</table>

**Emergency phases:**

<table>
<thead>
<tr>
<th><strong>Uncertainty phase</strong></th>
<th>A situation where uncertainty exists as to the safety of an aircraft and its occupants.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alert phase</strong></td>
<td>A situation where apprehension exists as to the safety of an aircraft and its occupants.</td>
</tr>
<tr>
<td><strong>Distress phase</strong></td>
<td>A situation where there is reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance.</td>
</tr>
<tr>
<td><strong>Equivalent single isolated wheel load</strong></td>
<td>The equivalent load that would be imposed on a pavement by a single wheel if any wheel group on an aircraft was replaced by a single wheel at the same tyre pressure.</td>
</tr>
<tr>
<td><strong>Essential radio navigation service</strong></td>
<td>A radio navigation service whose disruption has a significant impact on operations in the affected airspace or aerodrome.</td>
</tr>
</tbody>
</table>
**Estimate**

The time at which it is estimated that an aircraft will be over a position reporting point or over the destination.

**Estimated elapsed time (EET)**

The estimated time required to proceed from one significant point to another.

**Estimated off block time (EOBT)**

The estimated time at which the aircraft will commence movement associated with departure.

**Estimated time of arrival (ETA)**

For IFR flights, the time at which it is estimated that the aircraft will arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the aerodrome, the time at which the aircraft will arrive over the aerodrome. For VFR flights, the time at which it is estimated that the aircraft will arrive over the aerodrome.

**Expected approach time (EAT)**

The time at which ATC expects that an arriving aircraft, following a delay, will leave the holding fix to complete its approach for a landing.

**Note**—The holding fix referred to in the EAT is that shown on the instrument approach chart from which the instrument approach is prescribed to commence.

**Final approach**

That part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified:

- at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or
- at the point of interception of the last track specified in the approach procedure; and
- ends at a point in the vicinity of an aerodrome from which a landing can be made, or a missed approach initiated.

**Final approach altitude**

The specified altitude at which final approach is commenced.

**Final approach fix (FAF)**

A specified point on a non-precision instrument approach which identifies the commencement of the final segment.

**Final approach point (FAP)**

A specified point on the glide path of a precision instrument approach which identifies the commencement of the final segment.

**Note**—The FAP is co incident with the FAF of a localiser-based non-precision approach.

**Final approach segment**

That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

**Final leg**

The path of an aircraft in a straight line immediately preceding the landing (alighting) of the aircraft.

**Fix**

A geographical position of an aircraft at a specific time determined by visual reference to the surface, or by navigational aids.
| **Flight file** | A file stored on the NAIPS system which contains stored briefings, or a stored flight notification. Flight files are owned by pilots and/or operators, and updated at their request. |
| **Flight following** | The provision of an ongoing Radar/ADS-B Information Service (RIS). |
| **Flight Identification (FLT ID)** | An identification of up to 7 alpha-numeric characters entered by the pilot via a cockpit interface. Where possible, the Flight Identification must match the Aircraft Identification entered into Item 7 of the Flight Notification. |
| **Flight information** | Information useful for the safe and efficient conduct of flight, including information on air traffic, meteorological conditions, aerodrome conditions and airways facilities. |
| **Flight Information Area (FIA)** | An airspace of defined dimensions, excluding controlled airspace, within which flight information and SAR alerting services are provided by an ATS unit.  
  **Note**—FIAs may be sub divided to permit the specified ATS unit to provide its services on a discrete frequency or family of frequencies within particular areas. |
| **Flight Information Centre (FIC)** | A unit established to provide flight information service and SAR alerting service. |
| **Flight Information Region (FIR)** | An airspace of defined dimensions within which flight information service and SAR alerting service are provided. |
| **Flight Information Service (FIS)** | A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. |
| **Flight Level (FL)** | A surface of constant atmospheric pressure which is related to a specific pressure datum, 1013.2 HPa, and is separated from other such surfaces by specific pressure intervals. |
| **Flight Note** | Details of the route and timing of a proposed flight provided by the pilot-in-command of an aircraft, which is other than notification submitted to Airservices Australia, and which is required to be left with a person who could be expected to notify appropriate authorities in the event that the flight becomes overdue. |
| **Flight notification (within Australian FIR)** | Specified information provided to air traffic services units, relative to the intended flight or portion of flight of an aircraft. |
| **Flight path monitoring** | The use of ATS surveillance systems for the purpose of providing aircraft with information and advice relative to significant deviations from nominal flight path including deviations from the terms of their air traffic control clearances.  
  **Note**—Some applications may require a specific technology, for example, radar to support the function of flight path monitoring. |
<p>| <strong>Flight visibility</strong> | The visibility forward from the cockpit of an aircraft in flight. |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecast</td>
<td>A statement of expected meteorological conditions for a specified period, and for a specified area or portion of airspace.</td>
</tr>
<tr>
<td>Formation</td>
<td>Two or more aircraft flown in close proximity to each other and operating as a single aircraft with regard to navigation, position reporting and control.</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong>—Refer to CAR 163AA for conditions under which formation flight may be undertaken.</td>
</tr>
<tr>
<td>Full emergency (in the context of aerodrome emergency plans)</td>
<td>A situation in which the response of all agencies involved in the aerodrome emergency plan will be activated. A full emergency will be declared when an aircraft approaching the airport is known or suspected to be in such trouble that there is danger of an accident.</td>
</tr>
<tr>
<td>Glide path (GP)</td>
<td>A descent profile determined for vertical guidance during a final approach.</td>
</tr>
<tr>
<td>Global navigation satellite system (GNSS)</td>
<td>A satellite-based radio navigation system that uses signals from orbiting satellites to determine precise position and time. Global Navigation Satellite System (GNSS) including GPS, GLONASS, Galileo etc;</td>
</tr>
<tr>
<td>Global positioning system (GPS)</td>
<td>A GNSS constellation operated by the United States Government.</td>
</tr>
<tr>
<td>Gross weight</td>
<td>The weight of the aircraft together with the weight of all persons and goods (including fuel) on board the aircraft at that time.</td>
</tr>
<tr>
<td>Ground-based navigation aid</td>
<td>Refers to NDB, VOR, DME.</td>
</tr>
<tr>
<td>Ground taxiing</td>
<td>The movement of a helicopter under its own power and on its undercarriage wheels.</td>
</tr>
<tr>
<td>Ground visibility</td>
<td>The visibility at an aerodrome, as reported by an accredited observer.</td>
</tr>
<tr>
<td>Hazardous conditions</td>
<td>Meteorological conditions which may endanger aircraft or adversely affect their safe operation, particularly those phenomena associated with volcanic ash cloud and thunderstorms – icing, hail and turbulence.</td>
</tr>
<tr>
<td>Heading (HDG)</td>
<td>The direction in which the longitudinal axis of an aircraft is pointed, usually expressed in degrees from north (true, magnetic, compass or grid).</td>
</tr>
<tr>
<td>Height</td>
<td>The vertical distance of a level, a point or an object considered as a point measured from a specified datum.</td>
</tr>
<tr>
<td>Height above aerodrome (HAA) (non-precision approach or circling)</td>
<td>The height of the minimum descent altitude above the published aerodrome elevation.</td>
</tr>
<tr>
<td>Height above threshold (HAT) (precision approach)</td>
<td>The height of the decision altitude above the threshold elevation.</td>
</tr>
<tr>
<td><strong>Helicopter access corridor</strong></td>
<td>A corridor wholly within controlled airspace designed for the exclusive use of helicopters in VMC. The extent and alignment of the corridor is related to and delineated by prominent geographical/topographical features.</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Helicopter landing site (HLS)</strong></td>
<td>A place that is used as an aerodrome for the purposes of the landing and taking off of helicopters.</td>
</tr>
<tr>
<td><strong>Helicopter lane</strong></td>
<td>A lane, outside controlled airspace, designed for use by helicopters to facilitate traffic flow.</td>
</tr>
<tr>
<td><strong>Helicopter movement area</strong></td>
<td>The movement area for helicopters is that part of an aerodrome that can safely be used for the hovering, taxiing, take-off and landing of helicopters and consists of the manoeuvring area and aprons, but excluding those areas reserved for unrestricted use by the general public.</td>
</tr>
<tr>
<td><strong>High capacity aircraft</strong></td>
<td>An aircraft that is certified as having a maximum seating capacity exceeding 38 seats, or a maximum payload exceeding 4200 kg.</td>
</tr>
<tr>
<td><strong>Hold short line/lights</strong></td>
<td>A line marked across a runway, with associated lights, in accordance with the requirements of AIP AD 1.1, at which landing aircraft must stop when required during land and hold short operations (LAHSO).</td>
</tr>
<tr>
<td><strong>Holding bay</strong></td>
<td>A defined area where aircraft can be held, or bypassed, to facilitate efficient surface movement of aircraft.</td>
</tr>
<tr>
<td><strong>Holding fix</strong></td>
<td>A specified location identified by visual or other means in the vicinity of which the position of an aircraft in flight is maintained in accordance with ATC instructions.</td>
</tr>
<tr>
<td><strong>Holding procedure</strong></td>
<td>A predetermined manoeuvre which keeps an aircraft within a specified airspace whilst awaiting further clearance.</td>
</tr>
<tr>
<td><strong>Hospital aircraft</strong></td>
<td>A priority category for use by international aircraft when medical priority is required (see also Medical).</td>
</tr>
<tr>
<td><strong>Hot spot</strong></td>
<td>A location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary.</td>
</tr>
<tr>
<td><strong>ICAO 24-bit aircraft address (24-bit code)</strong></td>
<td>A unique identification code which is programmed into each specific aircraft’s transponder or ADS-B transmitter during installation. This code, expressed as six alphanumeric characters, provides a digital identification of the aircraft and is used by the air traffic system to link information contained in a flight notification to aircraft position information received via ADS-B.</td>
</tr>
<tr>
<td><strong>IFR pick-up</strong></td>
<td>A pilot procedure whereby a flight operating to the IFR in Class G airspace changes to VFR upon entering Class E airspace whilst awaiting an airways clearance. IFR pick-up is limited to FL180 and below.</td>
</tr>
<tr>
<td><strong>Identification</strong></td>
<td>The situation which exists when the position indication of a particular aircraft is seen on a situation display and positively identified by ATC.</td>
</tr>
<tr>
<td><strong>Independent Parallel Approaches</strong></td>
<td>Simultaneous instrument approaches to parallel or near-parallel instrument runways where ATS surveillance system separation minima between aircraft on adjacent extended runway centrelines are not prescribed.</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Independent parallel departures</strong></td>
<td>Simultaneous departures in the same direction from parallel or near-parallel instrument runways.</td>
</tr>
<tr>
<td><strong>Inertial navigation/reference system (INS/IRS)</strong></td>
<td>A self-contained navigation system that continually measures the acceleration acting upon the vehicle of which it is part. Suitably integrated, these forces provide velocity and thence position information.</td>
</tr>
<tr>
<td><strong>Instrument approach and landing operations:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Non-precision approach and landing operations</strong></td>
<td>Instrument approaches and landings which do not utilise electronic glide path guidance.</td>
</tr>
<tr>
<td><strong>Precision approach and landing operations</strong></td>
<td>Instrument approaches and landings using precision azimuth and glide path guidance with minima as determined by the category of operation. Categories of precision approach and landing operations are:</td>
</tr>
<tr>
<td></td>
<td>• Category I (CAT I) operation – a precision instrument approach and landing with a decision height not lower than 200 ft and a visibility not less than 800 m, or a runway visual range (RVR) not less than 550 m.</td>
</tr>
<tr>
<td></td>
<td>• Category II (CAT II) operation – a precision instrument approach and landing with a decision height lower than 200 ft but not lower than 100 ft, and an RVR not less than 350 m.</td>
</tr>
<tr>
<td></td>
<td>• Category IIIA (CAT IIIA) operation – a precision instrument approach and landing with a decision height lower than 100 ft, or no decision height and an RVR not less than 200 m.</td>
</tr>
<tr>
<td></td>
<td>• Category IIIB (CAT IIIB) operation – a precision instrument approach and landing with either, a decision height lower than 50 ft, or with no decision height and an RVR less than 200 m but not less than 50 m.</td>
</tr>
<tr>
<td></td>
<td>• Category IIIC (CAT IIIC) operation – a precision instrument approach and landing with no decision height and no RVR limitations.</td>
</tr>
<tr>
<td><strong>Instrument approach procedure</strong></td>
<td>A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en route obstacle clearance criteria apply.</td>
</tr>
<tr>
<td><strong>Intermediate fix (IF)</strong></td>
<td>A fix on an RNAV approach that marks the end of an initial segment and the beginning of the intermediate segment.</td>
</tr>
</tbody>
</table>
### In the vicinity
An aircraft is in the vicinity of a non-towered aerodrome if it is within a horizontal distance of 10 miles; and within a height above the aerodrome reference point that could result in conflict with operations at the aerodrome.

### Initial approach fix (IAF)
The fix at the commencement of an instrument approach.

### Initial approach segment
That segment of an instrument approach procedure between the initial approach fix and the intermediate approach fix or, where applicable, the final approach fix or point.

### Instrument landing system (ILS)
A precision instrument approach system which normally consists of the following electronic components:
- VHF localiser,
- UHF glideslope,
- VHF marker beacons.

### Instrument runway
One of the following types of runways intended for the operation of aircraft using instrument approach procedures:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-precision approach runway</td>
<td>An instrument runway served by visual aids and a non-visual aid providing at least directional guidance adequate for a straight-in approach.</td>
</tr>
<tr>
<td>Precision approach runway, CAT I</td>
<td>An instrument runway served by ILS and visual aids intended for operations with a decision height not lower than 200 ft and either a visibility not less than 800 m, or an RVR not less than 550 m.</td>
</tr>
<tr>
<td>Precision approach runway, CAT II</td>
<td>An instrument runway served by ILS and visual aids intended for operations with a decision height lower than 200 ft, but not lower than 100 ft and an RVR not less than 350 m.</td>
</tr>
<tr>
<td>Precision approach runway, CAT III</td>
<td>An instrument runway served by IIS to and along the surface of the runway and:</td>
</tr>
<tr>
<td></td>
<td>• for CAT IIIA – intended for operations with a decision height lower than 100 ft, or no decision height and an RVR not less than 200 m</td>
</tr>
<tr>
<td></td>
<td>• for CAT IIIB – intended for operations with a decision height lower than 50 ft, or no decision height and an RVR less than 200 m, but not less than 50 m</td>
</tr>
<tr>
<td></td>
<td>• for CAT IIIC – intended for operations with no decision height and no RVR limitations.</td>
</tr>
</tbody>
</table>

### Integrated aeronautical information package
A package which comprises the following:
- AIP, including amendment service;
- Supplements to the AIP Preflight Information Bulletins (PIBs); and
- Checklists and summaries.

### Integrity
That quality which relates to the trust which can be placed in the correctness of information supplied by a system. It includes the ability of a system to provide timely warnings to users when the system should not be used for navigation.

### Intermediate approach segment
That segment of an instrument approach procedure between either the intermediate approach fix and the final approach fix or point, or between the end of the reversal, race track or dead reckoning track procedure and the final approach fix or point, as appropriate.
| **Land and hold short operations (LAHSO)** | A procedure involving dependent operations conducted on two intersecting runways whereby aircraft land and depart on one runway while aircraft landing on the other runway hold short of the intersection. |
| **Landing area** | That part of the movement area intended for the landing or take-off of aircraft. |
| **Land rescue unit** | A land party equipped to undertake a search for an aircraft within the region of its responsibility. |
| **Level** | A generic term relating to the vertical position of an aircraft in flight and meaning variously, height, altitude or flight level. |
| **Licensed aerodrome** | A place that is licensed as an aerodrome under the Civil Aviation Regulations. |
| **Local standby (in the context of aerodrome emergency plans)** | A situation in which activation of only the airport-based agencies involved in the aerodrome emergency plan is warranted. A local standby will be the normal response when an aircraft approaching an airport is known or is suspected to have developed some defect, but the trouble is not such as would normally involve any serious difficulty in effecting a safe landing. |
| **Localiser (LOC)** | The component of an ILS which provides azimuth guidance to a runway. It may be used as part of an ILS or independently. |
| **Long range navigation system (LRNS)** | Area navigation systems limited to INS/IRS or GPS. |
| **Low jet route (LJR)** | A route, or part of a route, at or below 5000 ft AGL used by MLJ aircraft for low level, high speed navigation and/or terrain following exercises. |
| **Lowest safe altitude (LSALT)** | The lowest altitude which will provide safe terrain clearance at a given place. |
| **Manoeuvring area** | That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons. |
| **Marker** | An object displayed above ground level in order to indicate an obstacle or delineate a boundary. |
| **Marker beacon** | A type of radio beacon, the emissions of which radiate in a vertical pattern. |
| **Markings** | A symbol or group of symbols displayed on the surface of the movement area in order to convey aeronautical information. |
| **Maximum take-off weight (MTOW)** | The maximum take-off weight of an aircraft as specified in its certificate of airworthiness. |
Medical flight

A flight providing transport of medical patients, personnel, and/or equipment, prioritised as follows:

- MED 1—An aircraft proceeding to pick up, or carrying, a severely ill patient, or one for whom life support measures are being provided
- MED 2—An aircraft proceeding to pick up medical personnel and/or equipment urgently required for the transport of a MED 1 patient, or returning urgently required medical personnel and/or equipment at the termination of a MED 1 flight.

Automated meteorological telephone briefing (METBRIEF)

Self help system which delivers meteorological information on the telephone using a computer-generated voice, in response to a tone-generated telephone request.

Meteorological information

Meteorological report, analysis, forecast, and any other statement relating to existing or expected meteorological conditions.

Meteorological office (MO)

An office designated to provide meteorological services for air navigation.

Meteorological warning

A statement or meteorological report of the occurrence or expectation of a deterioration or improvement in meteorological conditions or of any meteorological phenomenon which may seriously affect the safe operation of aircraft.

Minimum altitude

The minimum altitude for a particular instrument approach procedure is the altitude specified by AIP DAP at which an aircraft shall discontinue an instrument approach unless continual visual reference to the ground or water has been established and ground visibility is equal to or greater than that specified by the DAP for landing.

Note—Applies to ‘old-type’ instrument approach charts.

Minimum descent altitude (MDA)

A specified altitude in a non-precision runway or circling approach below which descent may not be made without visual reference.

Note—Applies to ‘new-type’ instrument approach charts.

Minimum fuel

The term used to describe a situation in which an aircraft’s fuel supply has reached a state where little or no delay can be accepted.

Note—This is not an emergency situation but merely indicates that an emergency situation is possible, should any undue delay occur.

Minimum sector altitude (MSA)

The lowest altitude that will provide a minimum clearance of 1000 ft above all objects located in an area contained within a sector of a circle of 25 nm or 10 nm radius centred on a radio aid to navigation or, where there is no radio navigation aid, the aerodrome reference point.

Minimum vector altitude

The lowest altitude which a controller may assign to a pilot in accordance with the radar terrain clearance chart.

Missed approach holding Fix (MAHF)

A fix on an RNAV approach that marks the end of the missed approach segment and the point for the missed approach holding (where applicable).
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed approach point (MAPT)</td>
<td>That point in an instrument approach procedure at or before which the prescribed missed-approach procedure must be initiated in order to ensure that the minimum obstacle clearance is not infringed.</td>
</tr>
<tr>
<td>Missed approach procedure (MAP)</td>
<td>The procedure to be followed if an approach cannot be continued.</td>
</tr>
<tr>
<td>Missed approach turning fix (MATF)</td>
<td>A fix on an RNAV approach that marks a turning point during the missed approach segment.</td>
</tr>
<tr>
<td>Movement area</td>
<td>That part of an aerodrome to be used for the take off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron(s).</td>
</tr>
<tr>
<td>NAIPS</td>
<td>The National Aeronautical Information Processing System, which provides briefings and flight notification functions.</td>
</tr>
<tr>
<td>Navigation specification</td>
<td>A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:</td>
</tr>
<tr>
<td>RNP specification</td>
<td>A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, for example RNP 4, RNP APCH.</td>
</tr>
<tr>
<td>RNAV specification</td>
<td>A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, for example RNAV 5, RNAV 1.</td>
</tr>
<tr>
<td>Night</td>
<td>That period of time between the end of evening civil twilight and the beginning of morning civil twilight.</td>
</tr>
<tr>
<td>Non-directional beacon (NDB)</td>
<td>A special radio station, the emissions of which are intended to enable a mobile station to determine its radio bearing or direction with reference to that special radio station.</td>
</tr>
<tr>
<td>Non-controlled aerodrome</td>
<td>An aerodrome at which air traffic control is not operating. (Formerly designated non-towered)</td>
</tr>
<tr>
<td>NOTAM</td>
<td>Notice to airmen: a notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.</td>
</tr>
<tr>
<td>No-transgression zone (NTZ)</td>
<td>A corridor of airspace of defined dimensions located centrally between the two extended runway centre lines where controller intervention is required to manoeuvre aircraft when this airspace is penetrated by an aircraft conducting a simultaneous approach to a parallel instrument runway.</td>
</tr>
<tr>
<td>One-way route</td>
<td>A route with limitations for use in one direction, depicted on ERC-H, ERC-L and/or TAC charts by an arrow in the direction that can be used without limitation (see ERSA for additional details).</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Operator</td>
<td>A person, organisation or enterprise engaged in or offering to engage in aircraft operation.</td>
</tr>
<tr>
<td>Operations manual</td>
<td>A manual provided by an operator for the use and guidance of operations staff, containing instructions as to the conduct of flight operations, including the responsibilities of its operations staff (refer CAR 215).</td>
</tr>
<tr>
<td>Overshoot shear</td>
<td>A wind shear occurrence which produces an initial effect of overshooting the desired approach path and/or increasing airspeed.</td>
</tr>
<tr>
<td>Parking area</td>
<td>A specially prepared or selected part of an aerodrome within which aircraft may be parked.</td>
</tr>
<tr>
<td>Pavement classification number (PCN)</td>
<td>A number expressing the bearing strength of a pavement for unrestricted operations.</td>
</tr>
<tr>
<td>Performance-based navigation (PBN)</td>
<td>Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure, or in a designated airspace. Note Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept.</td>
</tr>
<tr>
<td>Permissible all-up-weight</td>
<td>The weight to which an aircraft is limited by virtue of the physical characteristics of an aerodrome.</td>
</tr>
<tr>
<td>Pilot-in-command</td>
<td>The pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight.</td>
</tr>
<tr>
<td>Precision approach procedure</td>
<td>An instrument approach procedure utilising azimuth and glide path information provided by ILS.</td>
</tr>
<tr>
<td>Precision Runway Monitor (PRM)</td>
<td>An ATS surveillance system and associated procedures used for independent parallel approaches to closely spaced runways.</td>
</tr>
<tr>
<td>Pre-departure clearance (PDC)</td>
<td>A means of delivering an unsolicited, text-based airways clearance to eligible aircraft via an ATC data link.</td>
</tr>
<tr>
<td>Preferred runway</td>
<td>A runway nominated by ATC or listed in the AIP as the most suitable for the prevailing wind, surface conditions or noise sensitive areas in the proximity of the aerodrome.</td>
</tr>
<tr>
<td>Primary means navigation system</td>
<td>A navigation system that, for a given operation or phase of flight, must meet accuracy and integrity requirements, but need not meet full availability and continuity of service requirements. Safety is achieved by either limiting flights to specific time periods, or through appropriate procedural restrictions and operational requirements.</td>
</tr>
<tr>
<td>Procedural service</td>
<td>Term used to indicate that information derived from an ATS surveillance system is not required for the provision of ATS.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Procedure altitude/height</td>
<td>A specified altitude/height flown at or above the minimum altitude/height, and established to accommodate a stabilised descent at a prescribed descent gradient/angle in the intermediate/final approach segment.</td>
</tr>
<tr>
<td>Prohibited area</td>
<td>An airspace of defined dimensions, above the land areas or territorial waters of a state, within which the flight of aircraft is prohibited. This designation is appropriate only for reasons of defence.</td>
</tr>
<tr>
<td>QNH altimeter setting</td>
<td>That pressure setting which, when placed on the pressure setting sub-scale of a sensitive altimeter of an aircraft located at the reference point of an aerodrome, will cause the altimeter to indicate the vertical displacement of the reference point above mean sea level.</td>
</tr>
<tr>
<td>Radio height</td>
<td>The radio altimeter reading which is equivalent to the OCA adjusted for terrain/obstacle profile.</td>
</tr>
<tr>
<td>Radio navigation service</td>
<td>A service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more radio navigation aids.</td>
</tr>
<tr>
<td>Radar/ADS-B information service (RIS)</td>
<td>An on-request service provided to assist pilots of VFR flights, within ATS surveillance system coverage in Class E and Class G airspace, to avoid other aircraft or to assist in navigation.</td>
</tr>
<tr>
<td>Rapid-exit taxiway</td>
<td>A taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at high relative speeds.</td>
</tr>
<tr>
<td>Receiver autonomous integrity monitoring (RAIM)</td>
<td>A system whereby an airborne GPS receiver/processor autonomously monitors the integrity of the navigation signals from GPS satellites.</td>
</tr>
<tr>
<td>Reduced vertical separation minimum (RVSM)</td>
<td>The vertical separation minimum of 1000 ft between FL290 and FL410 inclusive.</td>
</tr>
<tr>
<td>Repetitive flight plan</td>
<td>A flight plan referring to a series of frequently recurring, regularly operated individual flights with identical basic features, submitted by an operator for retention and repetitive use by ATS units.</td>
</tr>
<tr>
<td>Reporting point</td>
<td>A specified geographical location in relation to which the position of an aircraft can be reported.</td>
</tr>
<tr>
<td>Required navigation performance (RNP)</td>
<td>A statement of the navigation performance necessary for operation within a defined airspace.</td>
</tr>
<tr>
<td>RNP type</td>
<td>A containment value expressed as a distance in nautical miles from the intended position within which flights would be for at least 95 per cent of the total flying time.</td>
</tr>
<tr>
<td>Rescue Coordination Centre (RCC)</td>
<td>A unit established for promoting efficient organisation of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Restricted area</td>
<td>An airspace of defined dimensions above the land areas or territorial waters of a state, within which the flight of aircraft is restricted in accordance with certain specified conditions.</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong>—This designation is normally used whenever the activities of the administering authority of the airspace are a hazard to other users; or other users constitute a hazard to the activities of the administering authority.</td>
</tr>
<tr>
<td>Route</td>
<td>A way to be taken in flying from a departure to a destination aerodrome, specified in terms of track and distance for each route segment.</td>
</tr>
<tr>
<td>Runway (RWY)</td>
<td>A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.</td>
</tr>
<tr>
<td>Runway holding position</td>
<td>A designated position intended to protect a runway, an obstacle limitation surface, or an ILS critical/sensitive area at which taxiing aircraft and vehicles must stop and hold, unless otherwise authorised by the aerodrome control tower.</td>
</tr>
<tr>
<td>Runway number</td>
<td>The runway identification associated with the runway direction end.</td>
</tr>
<tr>
<td>Runway strip</td>
<td>The defined area, including the runway (and stopway if provided), intended to reduce the risk of damage to aircraft inadvertently running off the runway and to protect aircraft flying over it during take-off, landing or missed approach.</td>
</tr>
<tr>
<td>Runway visibility (RV)</td>
<td>The distance along a runway over which a person can see and recognise a visibility marker or runway lights.</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong>—The term runway visibility is used by ATC or ground personnel to report visibility along a runway as determined by a ground observer.</td>
</tr>
<tr>
<td>Runway visual range (RVR)</td>
<td>The range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line. (ICAO)</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong>—Within Australia, the term runway visual range or RVR will be used by ATC or ground personnel exclusively to report RVR determined by electronic means.</td>
</tr>
<tr>
<td>SARTIME</td>
<td>The time nominated by a pilot for the initiation of SAR action if an arrival report has not been received by the appropriate authority.</td>
</tr>
<tr>
<td>SARWATCH</td>
<td>A generic term covering SAR alerting based either on full position reporting procedures, scheduled reporting times (SKEDS), or SARTIME.</td>
</tr>
<tr>
<td>Search and rescue (SAR)</td>
<td>The act of finding and returning to safety, aircraft and persons involved in an emergency phase.</td>
</tr>
<tr>
<td>Search and rescue region (SRR)</td>
<td>The specified area within which search and rescue is coordinated by a particular rescue coordination centre.</td>
</tr>
<tr>
<td>Segment minimum safe altitude</td>
<td>The lowest altitude at which the minimum obstacle clearance is provided.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
</tr>
<tr>
<td>Segregated parallel operations</td>
<td>Simultaneous operations on parallel or near-parallel instrument runways in which one runway is used exclusively for approaches and the other runway is used exclusively for departures.</td>
</tr>
</tbody>
</table>
| Significant point | A specified geographical location used in defining an ATS route or the flight path of an aircraft and for other navigation and ATS purposes. **Note**—There are three categories of significant points:  
  - ground-based navigation aid  
  - intersection and  
  - waypoint.  
  In the context of this definition, intersection is a significant point expressed as radials, bearings and/or distances from ground-based navigation aids. |
<p>| Significant weather | Any weather phenomenon which might affect flight visibility or present a hazard to an aircraft. |
| Simultaneous opposite direction parallel runway operations (SODPROPS) | A condition whereby arriving aircraft will approach and land on one runway, concurrent with aircraft departures from the parallel runway in the opposite direction to that being used for approach and landing. |
| Situation display | An electronic display depicting the position and movement of aircraft and other information as required. |
| Sole-means navigation system | A navigation system that, for a given phase of flight, must allow the aircraft to meet all four navigation system performance requirements – accuracy, integrity, availability and continuity of service. |
| SSR code | The number assigned to a particular multiple-pulse reply signal transmitted by a transponder in Mode A or Mode C. |
| Standard instrument arrival (STAR) | A designated IFR arrival route linking a significant point, normally on an ATS route, with a point from which a published instrument approach procedure can be commenced. |
| Standard instrument departure (SID) | A designated IFR departure route linking the aerodrome or a specified runway of the aerodrome with a specified significant point, normally on a designated ATS route, at which the en route phase of a flight commences. |
| Standard pressure | The pressure of 1013.2 HPa which, if set up on the pressure sub-scale of a sensitive altimeter, will cause the latter to read zero when at mean sea level in a standard atmosphere. |
| Standard pressure region | Airspace above 10,000 ft where the sub-scale of a pressure-sensitive altimeter is set to 1013.2 HPa. |
| Stopway | A defined rectangular area on the ground at the end of the take-off run prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off. |
| Supplemental means navigation system | A navigation system that must be used in conjunction with a sole-means navigation system. |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tactical air navigation (TACAN)</td>
<td>An ultra-high frequency navigation aid which provides a continuous indication of bearing and slant range, in nautical miles, to the selected ground station.</td>
</tr>
<tr>
<td>Taxiway (TWY)</td>
<td>A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another.</td>
</tr>
<tr>
<td>Terrain clearance</td>
<td>The vertical displacement of an aircraft’s flight path from the terrain.</td>
</tr>
<tr>
<td>Threshold</td>
<td>The beginning of that portion of the runway usable for landing.</td>
</tr>
<tr>
<td>Threshold crossing height</td>
<td>The height of the ILS glide path at the threshold.</td>
</tr>
<tr>
<td>Total estimated elapsed time</td>
<td>For IFR flights, the estimated time required from take-off to arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or if no navigation aid is associated with the destination aerodrome, to arrive over the destination aerodrome. For VFR flights, the estimated time required from take-off to arrival over the destination aerodrome.</td>
</tr>
<tr>
<td>Touch-and-go landing</td>
<td>A procedure whereby an aircraft lands and takes off without coming to a stop.</td>
</tr>
<tr>
<td>Track</td>
<td>The projection on the earth’s surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from north (true, magnetic or grid).</td>
</tr>
<tr>
<td>Transition altitude</td>
<td>The altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes.</td>
</tr>
<tr>
<td>Transition layer</td>
<td>The airspace between the transition altitude and the transition level.</td>
</tr>
<tr>
<td>Transition level</td>
<td>The lowest flight level available for use above the transition altitude.</td>
</tr>
<tr>
<td>Transitional surface</td>
<td>An inclined plane associated with the runway strip and the approach surfaces.</td>
</tr>
<tr>
<td>Transponder</td>
<td>A receiver/transmitter which will generate a reply signal upon proper interrogation; the interrogation and reply being on different frequencies.</td>
</tr>
<tr>
<td>Unalerted see-and-avoid</td>
<td>A procedure where flight crew, who have no specific knowledge of other aircraft in their vicinity, rely solely on their ability to physically see and avoid colliding with aircraft that may be in their vicinity.</td>
</tr>
<tr>
<td>Undershoot shear</td>
<td>A wind shear occurrence which produces an initial effect of undershooting the desired approach path and/or decreasing air speed.</td>
</tr>
<tr>
<td>Universal Communications (UNICOM)</td>
<td>A non-ATS communications service provided to enhance the value of information normally available about a non-controlled aerodrome.</td>
</tr>
<tr>
<td>Unserviceable area</td>
<td>A portion of the movement area not available for use by aircraft because of the physical condition of the surface, or because of any obstruction on the area.</td>
</tr>
<tr>
<td><strong>Vectoring</strong></td>
<td>Provision of navigational guidance to aircraft in the form of specific headings, based on the use of an ATS surveillance system.</td>
</tr>
<tr>
<td><strong>VFR climb and descent</strong></td>
<td>ATC authorisation for an IFR flight in VMC, at or below FL180, in Classes D and E airspace, to conduct a visual climb or descent.</td>
</tr>
<tr>
<td><strong>VFR-on-top</strong></td>
<td>ATC authorisation for an IFR flight to operate in VMC, at or below FL180, in Class E airspace at any appropriate VFR altitude or flight level (in accordance with ENR 1.2 Section 2, ENR 1.7 Section 5. and as restricted by ATC).</td>
</tr>
<tr>
<td><strong>VHF omni-directional radio range (VOR)</strong></td>
<td>A VHF radio navigational aid which provides a continuous indication of bearing from the selected VOR ground station.</td>
</tr>
<tr>
<td><strong>Visibility</strong></td>
<td>Visibility for aeronautical purposes is the greater of:</td>
</tr>
<tr>
<td></td>
<td>• the greatest distance at which a black object of suitable dimensions, situated near the ground, can be seen and recognised when observed against a bright background or</td>
</tr>
<tr>
<td></td>
<td>• the greatest distance at which lights of about 1000 candelas can be seen and identified against an unlit background.</td>
</tr>
<tr>
<td><strong>Visual (ATC usage)</strong></td>
<td>used by ATC to instruct a pilot to see and avoid obstacles while conducting flight below the MVA or MSA/LSALT.</td>
</tr>
<tr>
<td><strong>Visual (pilot usage)</strong></td>
<td>used by a pilot to indicate acceptance of responsibility to see and avoid obstacles while operating below the MVA or MSA/LSALT.</td>
</tr>
<tr>
<td><strong>Visual approach slope indicator system (VASIS)</strong></td>
<td>A system of lights so arranged as to provide visual information to pilots on approach of their position in relation to the optimum approach slope for a particular runway.</td>
</tr>
<tr>
<td><strong>VS1G</strong></td>
<td>The one-G stall speed at which an aeroplane can develop a lift force (normal to the flight path) equal to its weight.</td>
</tr>
<tr>
<td><strong>Way point</strong></td>
<td>A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation. Way points are identified as either:</td>
</tr>
<tr>
<td></td>
<td>• Fly-by way point – A way point which requires turn anticipation to allow tangential interception of the next segment of a route or procedure, or</td>
</tr>
<tr>
<td></td>
<td>• Flyover way point – A way point at which a turn is initiated in order to join the next segment of a route or procedure.</td>
</tr>
</tbody>
</table>
# Abbreviations and acronyms

This list covers general and meteorological abbreviations and acronyms which may be found throughout the Guide and on associated charts, or which are used in NOTAM, AIP Supplements and meteorological messages and documentation.

## Notes

* Abbreviation may be used as spoken words in radio telephony.
† Abbreviation may be spoken using the constituent letters rather than the phonetic alphabet.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>A/A</td>
<td>Air to air</td>
</tr>
<tr>
<td>AACC</td>
<td>Area Approach Control Centre</td>
</tr>
<tr>
<td>AAD</td>
<td>Assigned altitude deviation</td>
</tr>
<tr>
<td>AAIS</td>
<td>Automatic Aerodrome Information Service</td>
</tr>
<tr>
<td>AAL</td>
<td>Above aerodrome level</td>
</tr>
<tr>
<td>ABI</td>
<td>Advance boundary information</td>
</tr>
<tr>
<td>ABM</td>
<td>Abeam</td>
</tr>
<tr>
<td>ABN</td>
<td>Aerodrome beacon</td>
</tr>
<tr>
<td>ABT</td>
<td>About</td>
</tr>
<tr>
<td>ABV</td>
<td>Above</td>
</tr>
<tr>
<td>AC</td>
<td>Altocumulus</td>
</tr>
<tr>
<td>ACARS*</td>
<td>Aircraft communication addressing and reporting system (pronounced ‘ay-cars’)</td>
</tr>
<tr>
<td>ACAS*</td>
<td>Airborne collision avoidance system</td>
</tr>
<tr>
<td>ACC†</td>
<td>Area control centre</td>
</tr>
<tr>
<td>ACCID</td>
<td>Initial notification of an aircraft accident</td>
</tr>
<tr>
<td>ACD</td>
<td>Airways clearance delivery</td>
</tr>
<tr>
<td>ACFT</td>
<td>Aircraft</td>
</tr>
<tr>
<td>ACK</td>
<td>Acknowledge</td>
</tr>
<tr>
<td>ACN</td>
<td>Aircraft classification number</td>
</tr>
<tr>
<td>ACPT</td>
<td>Accept, accepted</td>
</tr>
<tr>
<td>ACT</td>
<td>Active, activated, activity</td>
</tr>
<tr>
<td>AD</td>
<td>Aerodrome</td>
</tr>
<tr>
<td>ADC</td>
<td>Aerodrome chart</td>
</tr>
<tr>
<td>ADDGM</td>
<td>Aerodrome diagrams</td>
</tr>
<tr>
<td>ADDN</td>
<td>Addition, additional</td>
</tr>
<tr>
<td>ADF†</td>
<td>Automatic direction finding equipment</td>
</tr>
<tr>
<td>ADIZ†</td>
<td>Air defence identification zone</td>
</tr>
<tr>
<td>ADJ</td>
<td>Adjacent</td>
</tr>
<tr>
<td>ADMS</td>
<td>Aeronautical database management system</td>
</tr>
<tr>
<td>ADR</td>
<td>Advisory route</td>
</tr>
<tr>
<td>ADS-B†</td>
<td>Automatic dependent surveillance-broadcast</td>
</tr>
<tr>
<td>ADS-C†</td>
<td>Automatic dependent surveillance-contract</td>
</tr>
<tr>
<td>ADZ</td>
<td>Advise</td>
</tr>
<tr>
<td>AEP</td>
<td>Aerodrome emergency plan</td>
</tr>
<tr>
<td>AERIS*</td>
<td>Automatic En Route Information Service</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
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</tr>
<tr>
<td>AFIL</td>
<td>Flight notification (filed in the air, or indicating the position at which ATS services will first be required)</td>
</tr>
<tr>
<td>AFM</td>
<td>Yes, affirm, affirmative, that is correct</td>
</tr>
<tr>
<td>AFRU</td>
<td>Aerodrome frequency response unit</td>
</tr>
<tr>
<td>AFS</td>
<td>Aeronautical fixed service</td>
</tr>
<tr>
<td>AFT</td>
<td>After</td>
</tr>
<tr>
<td>AFTN†</td>
<td>Aeronautical fixed telecommunication network</td>
</tr>
<tr>
<td>AFZ</td>
<td>Australian fishing zone(s)</td>
</tr>
<tr>
<td>A/G</td>
<td>Air-to-ground</td>
</tr>
<tr>
<td>AGA</td>
<td>Aerodromes, air routes and ground aids</td>
</tr>
<tr>
<td>AGL†</td>
<td>Above ground level</td>
</tr>
<tr>
<td>AGN</td>
<td>Again</td>
</tr>
<tr>
<td>AH</td>
<td>After hours</td>
</tr>
<tr>
<td>AIC†</td>
<td>Aeronautical information circular</td>
</tr>
<tr>
<td>AIP†</td>
<td>Aeronautical Information Publication</td>
</tr>
<tr>
<td>AIRAC*</td>
<td>Aeronautical Information Regulation and Control</td>
</tr>
<tr>
<td>AIREP*</td>
<td>Air report</td>
</tr>
<tr>
<td>AIRMET*</td>
<td>Information in plain language concerning weather significant to light aircraft operations at or below 10,000 ft</td>
</tr>
<tr>
<td>AIS†</td>
<td>Aeronautical Information Service</td>
</tr>
<tr>
<td>AL</td>
<td>Approach lights</td>
</tr>
<tr>
<td>ALA†</td>
<td>Aircraft landing area (for the purpose of CAR 92(1)(d))</td>
</tr>
<tr>
<td>ALERFA*</td>
<td>Alert phase</td>
</tr>
<tr>
<td>ALM</td>
<td>Aircraft landing minima</td>
</tr>
<tr>
<td>ALR</td>
<td>Alerting message</td>
</tr>
<tr>
<td>ALS</td>
<td>Approach lighting system</td>
</tr>
<tr>
<td>ALT</td>
<td>Altitude</td>
</tr>
<tr>
<td>ALTN</td>
<td>Alternate, alternating (light alternates in colour)</td>
</tr>
<tr>
<td>ALTN</td>
<td>Alternate (aerodrome)</td>
</tr>
<tr>
<td>AMD</td>
<td>Amend, amended</td>
</tr>
<tr>
<td>AMDT</td>
<td>Amendment (AIP Amendment)</td>
</tr>
<tr>
<td>AMSL†</td>
<td>Above mean sea level</td>
</tr>
<tr>
<td>ANC</td>
<td>Aeronautical chart 1:500,00 (followed by name/title)</td>
</tr>
<tr>
<td>AOC</td>
<td>Aerodrome obstruction chart (followed by name/title)</td>
</tr>
<tr>
<td>AOCC</td>
<td>Air operator’s certificate</td>
</tr>
<tr>
<td>AP</td>
<td>Airport</td>
</tr>
<tr>
<td>APAPI*</td>
<td>Abbreviated precision approach path indicator (pronounced ‘ay-papi’)</td>
</tr>
<tr>
<td>APCH</td>
<td>Approach</td>
</tr>
<tr>
<td>APDC</td>
<td>Aircraft parking/docking chart (followed by name/title)</td>
</tr>
<tr>
<td>APN</td>
<td>Apron</td>
</tr>
<tr>
<td>APP</td>
<td>Approach control, approach control office, approach control service</td>
</tr>
<tr>
<td>APR</td>
<td>April</td>
</tr>
<tr>
<td>APRX</td>
<td>Approximate, approximately</td>
</tr>
<tr>
<td>APSG</td>
<td>After passing</td>
</tr>
<tr>
<td>APV</td>
<td>Approve, approved, approval</td>
</tr>
<tr>
<td>AOZ</td>
<td>Area QNH Zone</td>
</tr>
<tr>
<td>ARFL</td>
<td>Aeroplane reference field length</td>
</tr>
<tr>
<td>ARN</td>
<td>Aviation reference number</td>
</tr>
<tr>
<td>ARNG</td>
<td>Arrange</td>
</tr>
<tr>
<td>ARP</td>
<td>Aerodrome reference point</td>
</tr>
<tr>
<td>ARP</td>
<td>Air report (message type designator)</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>ARR</td>
<td>Arrive, arrival</td>
</tr>
<tr>
<td>ARS</td>
<td>Special air report (message type designator)</td>
</tr>
<tr>
<td>AS</td>
<td>Altostratus</td>
</tr>
<tr>
<td>ASAP†</td>
<td>As soon as possible</td>
</tr>
<tr>
<td>ASC</td>
<td>Ascent to, ascending to</td>
</tr>
<tr>
<td>ASDA</td>
<td>Accelerate-stop distance available</td>
</tr>
<tr>
<td>ASE</td>
<td>Altimetry system error</td>
</tr>
<tr>
<td>A-SMGCS</td>
<td>Advanced surface movement guidance and control system</td>
</tr>
<tr>
<td>ASPH</td>
<td>Asphalt</td>
</tr>
<tr>
<td>ASR</td>
<td>Area surveillance radar</td>
</tr>
<tr>
<td>ATA†</td>
<td>Actual time of arrival</td>
</tr>
<tr>
<td>ATC†</td>
<td>Air traffic control (in general)</td>
</tr>
<tr>
<td>ATD†</td>
<td>Actual time of departure</td>
</tr>
<tr>
<td>ATFM</td>
<td>Air traffic flow management</td>
</tr>
<tr>
<td>ATM</td>
<td>Air traffic management</td>
</tr>
<tr>
<td>ATP</td>
<td>At (Time or Place)</td>
</tr>
<tr>
<td>ATIS*</td>
<td>Automatic terminal information service</td>
</tr>
<tr>
<td>ATS</td>
<td>Air traffic services</td>
</tr>
<tr>
<td>ATTN</td>
<td>Attention</td>
</tr>
<tr>
<td>AT-VASIS*</td>
<td>Abbreviated ‘T’ visual approach slope indicator system (pronounced ‘ay-tee-vasis’)</td>
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<tr>
<td>ATZ</td>
<td>Aerodrome traffic zone</td>
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<tr>
<td>AUG</td>
<td>August</td>
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<tr>
<td>AUTH</td>
<td>Authorised, authorisation</td>
</tr>
<tr>
<td>AUTO</td>
<td>Fully automated report (met code)</td>
</tr>
<tr>
<td>AUW</td>
<td>All-up weight</td>
</tr>
<tr>
<td>AUX</td>
<td>Auxiliary</td>
</tr>
<tr>
<td>AVM</td>
<td>Abrupt vertical manoeuvres (by the military)</td>
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<tr>
<td>AVBL</td>
<td>Available</td>
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<tr>
<td>AVG</td>
<td>Average</td>
</tr>
<tr>
<td>AVGAS*</td>
<td>Aviation gasoline</td>
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<tr>
<td>AWIS</td>
<td>Aerodrome Weather Information Service</td>
</tr>
<tr>
<td>AWK</td>
<td>Aerial work</td>
</tr>
<tr>
<td>AWS</td>
<td>Automatic weather station</td>
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<tr>
<td>AWY</td>
<td>Airway</td>
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<tr>
<td>AZM</td>
<td>Azimuth</td>
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<tr>
<td>B</td>
<td>Blue</td>
</tr>
<tr>
<td>BASE*</td>
<td>Cloud base</td>
</tr>
<tr>
<td>BCFG</td>
<td>Fog patches</td>
</tr>
<tr>
<td>BCN</td>
<td>Beacon (aeronautical ground light)</td>
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<tr>
<td>BCST</td>
<td>Broadcast</td>
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<tr>
<td>BCTA</td>
<td>Base of CTA (only on charts)</td>
</tr>
<tr>
<td>BDRY</td>
<td>Boundary</td>
</tr>
<tr>
<td>BECMG</td>
<td>Becoming</td>
</tr>
<tr>
<td>BFR</td>
<td>Before</td>
</tr>
<tr>
<td>BKN</td>
<td>Broken (cloud descriptor)</td>
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<tr>
<td>BL</td>
<td>Blowing (followed by: DU = dust; SA = sand; SN = snow)</td>
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<tr>
<td>BLDG</td>
<td>Building</td>
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<tr>
<td>BLO</td>
<td>Below clouds</td>
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<tr>
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<td>Below</td>
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<td>Bombing</td>
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<tr>
<td>BR</td>
<td>Mist</td>
</tr>
<tr>
<td>BRF</td>
<td>Brief/short (to indicate type of approach)</td>
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<tr>
<td>Abbreviation</td>
<td>Definition</td>
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<td>Bearing</td>
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<tr>
<td>BRKG</td>
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<tr>
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<td>Between layers</td>
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<td>Between</td>
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<tr>
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<td>Clear type of ice formation</td>
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<td>Cloud</td>
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<td>Charter</td>
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<tr>
<td>CI</td>
<td>Cirrus</td>
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<tr>
<td>CIT</td>
<td>Near, over large town(s)</td>
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<td>CIV</td>
<td>Civil</td>
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<tr>
<td>CK</td>
<td>Check</td>
</tr>
<tr>
<td>CB†</td>
<td>Cumulonimbus</td>
</tr>
<tr>
<td>CC</td>
<td>Cirrocumulus</td>
</tr>
<tr>
<td>CCTS</td>
<td>Circuits</td>
</tr>
<tr>
<td>CEN</td>
<td>En route and area ATC unit</td>
</tr>
<tr>
<td>CET</td>
<td>Clearance expiry time</td>
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<tr>
<td>CA/GRS</td>
<td>Certified air/ground radio service</td>
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<td>Civil Aviation Order</td>
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<td>Civil Aviation Regulation</td>
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<td>CASA</td>
<td>Civil Aviation Safety Authority</td>
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<td>CAT*</td>
<td>Category</td>
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<tr>
<td>CAT</td>
<td>Clear air turbulence</td>
</tr>
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<td>CAVOK*</td>
<td>Visibility, cloud and present weather better than prescribed values of conditions (pronounced 'cav-okay')</td>
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<td>Cloud</td>
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<td>Civil</td>
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<tr>
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<td>Check</td>
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</table>

**Index – Abbreviations and acronyms**

- **BRG**: Bearing
- **BRKG**: Braking
- **BS**: Broadcasting station (commercial)
- **BTL**: Between layers
- **BTN**: Between
- **C/L**: Centre line
- **CLA**: Clear type of ice formation
- **CLBR**: Calibration
- **CLD**: Cloud
- **CLG**: Calling
- **CLIAS**: Climbing indicated airspeed
- **CLR**: Clear, cleared to, clearance
- **CLSD**: Closed, close, closing
- **CM**: Centimetre
- **CM**: Change frequency to
- **CMF**: Confirm, I confirm
- **CH**: Channel
- **CHTR**: Charter
- **CI**: Cirrus
- **CIT**: Near, over large town(s)
- **CIV**: Civil
- **CK**: Check
- **CB†**: Cumulonimbus
- **CC**: Cirrocumulus
- **CCTS**: Circuits
- **CEN**: En route and area ATC unit
- **CET**: Clearance expiry time
- **CF**: Change frequency to
- **CFM**: Confirm, I confirm
- **CH**: Channel
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<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<td>CS</td>
<td>Cirrostratus</td>
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<td>CS</td>
<td>Call sign</td>
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<td>CTA†</td>
<td>Control area</td>
</tr>
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<td>CTAF*</td>
<td>Common traffic advisory frequency</td>
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<td>Contact</td>
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<td>CTL</td>
<td>Control</td>
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<td>Departure end of runway</td>
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<td>Descend to, descending to</td>
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<td>Destination</td>
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<td>DETRESFA*</td>
<td>Distress phase</td>
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<td>Direction finder/finding</td>
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<td>Direct flight data recorder</td>
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<td>Diversion, divert, diverting</td>
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<td>DLA</td>
<td>Delay, delayed</td>
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<td>DLIC</td>
<td>Data link initiation capability</td>
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<td>DLY</td>
<td>Daily</td>
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<td>DME†</td>
<td>Distance measuring equipment</td>
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<td>Danger, dangerous</td>
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<td>Dew point temperature</td>
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<td>DPT</td>
<td>Depth</td>
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<td>DR†</td>
<td>Dead reckoning</td>
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<td>DR</td>
<td>Low Drifting (followed by: DU = dust; SN=snow; SA = sand)</td>
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<td>Descend to and maintain</td>
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<td>Date-time group</td>
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<td>DTHR</td>
<td>Displaced runway threshold</td>
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<td>DTRT</td>
<td>Deteriorate, deteriorating</td>
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<td>Dust</td>
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<td>DUC</td>
<td>Dense upper cloud</td>
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<td>Abbreviation</td>
<td>Definition</td>
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<td>--------------</td>
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<tr>
<td><strong>DUR</strong></td>
<td>Duration</td>
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<tr>
<td><strong>D-VOLMET</strong></td>
<td>Data link VOLMET</td>
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<tr>
<td><strong>DVOR</strong></td>
<td>Doppler VOR</td>
</tr>
<tr>
<td><strong>DZ</strong></td>
<td>Drizzle</td>
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<td><strong>E</strong></td>
<td>East, east longitude</td>
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<td><strong>EAT</strong></td>
<td>Expected approach time</td>
</tr>
<tr>
<td><strong>EB</strong></td>
<td>Eastbound</td>
</tr>
<tr>
<td><strong>EET†</strong></td>
<td>Estimated elapsed time</td>
</tr>
<tr>
<td><strong>EHF</strong></td>
<td>Extremely high frequency (30,000 to 300,000 MHZ)</td>
</tr>
<tr>
<td><strong>ELEV</strong></td>
<td>Elevation</td>
</tr>
<tr>
<td><strong>ELR</strong></td>
<td>Extra long range</td>
</tr>
<tr>
<td><strong>ELT†</strong></td>
<td>Emergency locator transmitter</td>
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<td><strong>EM</strong></td>
<td>Emission</td>
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<td><strong>EMBD</strong></td>
<td>Embedded in a layer (to indicate cumulonimbus embedded in layers of other clouds)</td>
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<td>Emergency</td>
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<td>Endurance</td>
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<td><strong>ENE</strong></td>
<td>East north-east</td>
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<td><strong>ENG</strong></td>
<td>Engine</td>
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<td><strong>ENR</strong></td>
<td>En route</td>
</tr>
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<td><strong>EOBT</strong></td>
<td>Estimated off blocks time</td>
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<td><em><em>EPIRB</em>†</em>*</td>
<td>Electronic position indicating radio beacon (marine term)</td>
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<td><strong>EQPT</strong></td>
<td>Equipment</td>
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<td><strong>ERC†</strong></td>
<td>En Route Chart</td>
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<td><strong>ERSA</strong></td>
<td>En Route Supplement Australia</td>
</tr>
<tr>
<td><strong>ESE</strong></td>
<td>East South-East</td>
</tr>
<tr>
<td><strong>EST</strong></td>
<td>Estimate, estimate as message type indicator</td>
</tr>
<tr>
<td><strong>ETA†</strong></td>
<td>Estimated time of arrival, estimating arrival</td>
</tr>
<tr>
<td><strong>ETD†</strong></td>
<td>Estimated time of departure, estimating departure</td>
</tr>
<tr>
<td><strong>ETO</strong></td>
<td>Estimated time over significant point</td>
</tr>
<tr>
<td><strong>ETOPS</strong></td>
<td>Extended range operations by aeroplanes with two turbine power units</td>
</tr>
<tr>
<td><strong>EV</strong></td>
<td>Every</td>
</tr>
<tr>
<td><strong>EXC</strong></td>
<td>Except</td>
</tr>
<tr>
<td><strong>EXER</strong></td>
<td>Exercises, exercising, to exercise</td>
</tr>
<tr>
<td><strong>EXP</strong></td>
<td>Expect, expected, expecting</td>
</tr>
<tr>
<td><strong>EXTD</strong></td>
<td>Extend, extending, extended</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td>Fixed (chart symbol)</td>
</tr>
<tr>
<td><strong>FAC</strong></td>
<td>Facility, facilities</td>
</tr>
<tr>
<td><strong>FAF</strong></td>
<td>Final approach fix</td>
</tr>
<tr>
<td><strong>FAP</strong></td>
<td>Final approach point</td>
</tr>
<tr>
<td><strong>FATO</strong></td>
<td>Final approach and take-off area</td>
</tr>
<tr>
<td><em><em>FAX</em>†</em>*</td>
<td>Facsimile transmission</td>
</tr>
<tr>
<td><strong>FBL</strong></td>
<td>Light (to indicate the intensity of WX phenomena, interference or static reports, for example FBL RA = light rain)</td>
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<tr>
<td><strong>FC</strong></td>
<td>Funnel cloud (tornado or water spout)</td>
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<tr>
<td><strong>FCST</strong></td>
<td>Forecast</td>
</tr>
<tr>
<td><strong>FDPS</strong></td>
<td>Flight data processing system</td>
</tr>
<tr>
<td><strong>FEB</strong></td>
<td>February</td>
</tr>
<tr>
<td><strong>FEW</strong></td>
<td>Few (cloud descriptor)</td>
</tr>
<tr>
<td><strong>FFR</strong></td>
<td>Flood, fire relief</td>
</tr>
<tr>
<td><strong>FG</strong></td>
<td>Fog</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Meaning</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td>FIA&lt;sup&gt;†&lt;/sup&gt;</td>
<td>Flight information area</td>
</tr>
<tr>
<td>FIC&lt;sup&gt;†&lt;/sup&gt;</td>
<td>Flight information centre</td>
</tr>
<tr>
<td>FIR&lt;sup&gt;†&lt;/sup&gt;</td>
<td>Flight information region</td>
</tr>
<tr>
<td>FIS&lt;sup&gt;†&lt;/sup&gt;</td>
<td>Flight information service</td>
</tr>
<tr>
<td>FL</td>
<td>Flight Level</td>
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<td>FLD</td>
<td>Field</td>
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<td>FLG</td>
<td>Flashing</td>
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<tr>
<td>FLR</td>
<td>Flares</td>
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<td>Flight</td>
</tr>
<tr>
<td>FLTCK</td>
<td>Flight check</td>
</tr>
<tr>
<td>FLUC</td>
<td>Fluctuating, fluctuation, fluctuated</td>
</tr>
<tr>
<td>FLW</td>
<td>Follow(s), following</td>
</tr>
<tr>
<td>FLY</td>
<td>Fly, flying</td>
</tr>
<tr>
<td>FM</td>
<td>From</td>
</tr>
<tr>
<td>FM</td>
<td>From (followed by time weather change is forecast to begin)</td>
</tr>
<tr>
<td>FMS&lt;sup&gt;†&lt;/sup&gt;</td>
<td>Flight management system</td>
</tr>
<tr>
<td>FMU</td>
<td>Flow management unit</td>
</tr>
<tr>
<td>FN</td>
<td>‘Fly neighbourly’ area</td>
</tr>
<tr>
<td>FNA</td>
<td>Final approach</td>
</tr>
<tr>
<td>FPD</td>
<td>Flight plan designator</td>
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<td>FPL</td>
<td>Filed flight plan message</td>
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<tr>
<td>FPM</td>
<td>Feet per minute</td>
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<tr>
<td>FPR</td>
<td>Flight plan route</td>
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<tr>
<td>FR</td>
<td>Fuel remaining</td>
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<tr>
<td>FRI</td>
<td>Friday</td>
</tr>
<tr>
<td>FREQ</td>
<td>Frequency</td>
</tr>
<tr>
<td>FRNG</td>
<td>Firing</td>
</tr>
<tr>
<td>FRQ</td>
<td>Frequent</td>
</tr>
<tr>
<td>FS&lt;sup&gt;†&lt;/sup&gt;</td>
<td>Flight service (in general)</td>
</tr>
<tr>
<td>FSL</td>
<td>Full stop landing</td>
</tr>
<tr>
<td>FSP</td>
<td>Fish spotting</td>
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<td>FST</td>
<td>First</td>
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<td>FT</td>
<td>Feet</td>
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<td>FU</td>
<td>Smoke</td>
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<td>FXD</td>
<td>Fixed</td>
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<td>Freezing</td>
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<td>Freezing drizzle</td>
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<td>Freezing fog</td>
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<td>FZL</td>
<td>Freezing level</td>
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<tr>
<td>FZRA</td>
<td>Freezing rain</td>
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<tr>
<td>G</td>
<td>Green</td>
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<tr>
<td>G</td>
<td>Variation from mean wind speed (gusts) (MET – in METAR/SPECI and TAF code forms)</td>
</tr>
<tr>
<td>GAAP</td>
<td>General aviation aerodrome procedures</td>
</tr>
<tr>
<td>GAP</td>
<td>Graphical area forecast</td>
</tr>
<tr>
<td>GBAS&lt;sup&gt;†&lt;/sup&gt;</td>
<td>Ground-based augmentation</td>
</tr>
<tr>
<td>GCA&lt;sup&gt;†&lt;/sup&gt;</td>
<td>Ground-controlled approach</td>
</tr>
<tr>
<td>GEN</td>
<td>General</td>
</tr>
<tr>
<td>GEO</td>
<td>Geographic, true</td>
</tr>
<tr>
<td>GES</td>
<td>Ground earth station</td>
</tr>
<tr>
<td>GFY</td>
<td>Glider flying</td>
</tr>
<tr>
<td>GLD</td>
<td>Glider</td>
</tr>
<tr>
<td>GLONASS*</td>
<td>Global orbiting navigation satellite system (pronounced ‘glo-nas’)</td>
</tr>
<tr>
<td>GLS&lt;sup&gt;†&lt;/sup&gt;</td>
<td>GBAS landing system</td>
</tr>
<tr>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>GNDCK</td>
<td>Ground check</td>
</tr>
<tr>
<td>GNS</td>
<td>Global navigation system</td>
</tr>
<tr>
<td><strong>Abbreviation</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>-----------------</td>
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</tr>
<tr>
<td>GNSS†</td>
<td>Global navigation satellite system</td>
</tr>
<tr>
<td>GP</td>
<td>Glide path</td>
</tr>
<tr>
<td>GP FLG</td>
<td>Group flashing (followed by number) (in conjunction with aerodrome lighting)</td>
</tr>
<tr>
<td>GPI</td>
<td>Glide path intercept</td>
</tr>
<tr>
<td>GPS†</td>
<td>Global positioning system</td>
</tr>
<tr>
<td>GR</td>
<td>Hail</td>
</tr>
<tr>
<td>GRAD</td>
<td>Minimum required climb gradient</td>
</tr>
<tr>
<td>GRASS*</td>
<td>Grass landing area</td>
</tr>
<tr>
<td>GRVL</td>
<td>Gravel</td>
</tr>
<tr>
<td>GS</td>
<td>Ground speed</td>
</tr>
<tr>
<td>GS</td>
<td>Small hail and/or snow pellets</td>
</tr>
<tr>
<td>GUND</td>
<td>Geoid undulation</td>
</tr>
<tr>
<td>GWPT</td>
<td>Grid point wind and temperature</td>
</tr>
<tr>
<td>H</td>
<td>High pressure area or the centre of high pressure (MET)</td>
</tr>
<tr>
<td>H24†</td>
<td>Continuous day and night service</td>
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<tr>
<td>HAA</td>
<td>Height above aerodrome</td>
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<td>HAT</td>
<td>Height above threshold</td>
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<td>HBN</td>
<td>Hazard beacon</td>
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<tr>
<td>HDG</td>
<td>Heading</td>
</tr>
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<td>HDS</td>
<td>Hours of daylight saving</td>
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<tr>
<td>HEL</td>
<td>Helicopter</td>
</tr>
<tr>
<td>HF†</td>
<td>High frequency (3000 to 30,000 KHZ)</td>
</tr>
<tr>
<td>HGT</td>
<td>Height, height above</td>
</tr>
<tr>
<td>HIAL*</td>
<td>High intensity approach lighting</td>
</tr>
<tr>
<td>HIOL</td>
<td>High intensity obstacle lighting</td>
</tr>
<tr>
<td>HIRL</td>
<td>High intensity runway lighting</td>
</tr>
<tr>
<td>HJ†</td>
<td>Sunrise to sunset</td>
</tr>
<tr>
<td>HLDG</td>
<td>Holding</td>
</tr>
<tr>
<td>HLS</td>
<td>Helicopter landing site</td>
</tr>
<tr>
<td>HN†</td>
<td>Sunset to sunrise</td>
</tr>
<tr>
<td>HO</td>
<td>Service available to meet operational requirements</td>
</tr>
<tr>
<td>HOSP</td>
<td>Hospital aircraft</td>
</tr>
<tr>
<td>HPA</td>
<td>Hectopascal</td>
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<td>HR</td>
<td>Hours</td>
</tr>
<tr>
<td>HS</td>
<td>Homestead</td>
</tr>
<tr>
<td>HS</td>
<td>Service available during hours of scheduled operations</td>
</tr>
<tr>
<td>HSL</td>
<td>Hold short lights</td>
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<tr>
<td>HURCN</td>
<td>Hurricane</td>
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<tr>
<td>HVY</td>
<td>Heavy</td>
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<tr>
<td>HVY</td>
<td>Heavy (to indicate the intensity of WX phenomena, for example HVY RA = heavy rain)</td>
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<tr>
<td>HX</td>
<td>No specific working hours</td>
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<td>Higher</td>
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<tr>
<td>HZ</td>
<td>Haze</td>
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<td>Hertz</td>
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<tr>
<td>HZS</td>
<td>Horizontal surface</td>
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<td>IAC</td>
<td>Instrument approach chart (followed by name/title)</td>
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<tr>
<td>IAF</td>
<td>Initial approach fix</td>
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<tr>
<td>IAL†</td>
<td>Instrument approach and landing</td>
</tr>
<tr>
<td>IAO</td>
<td>In and out of clouds</td>
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<tr>
<td>IAS†</td>
<td>Indicated air speed</td>
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<td>IBN</td>
<td>Identification beacon</td>
</tr>
<tr>
<td>ICAO*</td>
<td>International Civil Aviation Organization</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Meaning</td>
</tr>
<tr>
<td>--------------</td>
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<tr>
<td>IC</td>
<td>Ice crystals (meteorological code)</td>
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<tr>
<td>ICE</td>
<td>Icing, ice</td>
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<tr>
<td>ID</td>
<td>Identifier, identify</td>
</tr>
<tr>
<td>IDENT*</td>
<td>Identification</td>
</tr>
<tr>
<td>IF</td>
<td>Intermediate fix or intermediate approach fix</td>
</tr>
<tr>
<td>IFF†</td>
<td>Identification friend/foe</td>
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<tr>
<td>IFR†</td>
<td>Instrument flight rules</td>
</tr>
<tr>
<td>ILS†</td>
<td>Instrument landing system</td>
</tr>
<tr>
<td>IM</td>
<td>Inner marker</td>
</tr>
<tr>
<td>IMC†</td>
<td>Instrument meteorological conditions</td>
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<tr>
<td>IMG</td>
<td>Immigration</td>
</tr>
<tr>
<td>IMPR</td>
<td>Improve, improving, improvement</td>
</tr>
<tr>
<td>IMT</td>
<td>Immediate, immediately</td>
</tr>
<tr>
<td>INBD</td>
<td>Inbound</td>
</tr>
<tr>
<td>INC†</td>
<td>In cloud</td>
</tr>
<tr>
<td>INCERFA*</td>
<td>Uncertainty phase</td>
</tr>
<tr>
<td>INFO*</td>
<td>Information</td>
</tr>
<tr>
<td>INOP*</td>
<td>Inoperative</td>
</tr>
<tr>
<td>INS†</td>
<td>Inertial navigation system</td>
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<tr>
<td>INSTL</td>
<td>Install, installed, installation</td>
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<tr>
<td>INSTR</td>
<td>Instrument</td>
</tr>
<tr>
<td>INT</td>
<td>Intersection</td>
</tr>
<tr>
<td>INTER*</td>
<td>Intermittent, intermittently</td>
</tr>
<tr>
<td>INTL</td>
<td>International</td>
</tr>
<tr>
<td>INTRG</td>
<td>Interrogator</td>
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<td>INTRP</td>
<td>Interrupt, interruption, interrupted</td>
</tr>
<tr>
<td>INTSF</td>
<td>Intensify, intensifying</td>
</tr>
<tr>
<td>INTST</td>
<td>Intensity</td>
</tr>
<tr>
<td>ISA*</td>
<td>International standard atmosphere</td>
</tr>
<tr>
<td>ISB</td>
<td>Independent sideband</td>
</tr>
<tr>
<td>ISOL</td>
<td>Isolated</td>
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<tr>
<td>IWl</td>
<td>Illuminated wind indicator</td>
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<tr>
<td>JAN</td>
<td>January</td>
</tr>
<tr>
<td>J-BAR*</td>
<td>Jet barrier</td>
</tr>
<tr>
<td>JF</td>
<td>Saturday, Sunday and public holidays</td>
</tr>
<tr>
<td>JO</td>
<td>Monday to Friday except public holidays</td>
</tr>
<tr>
<td>JTST</td>
<td>Jet stream</td>
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<tr>
<td>JUL</td>
<td>July</td>
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<td>JUN</td>
<td>June</td>
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<td>KG</td>
<td>Kilograms</td>
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<td>KHZ</td>
<td>Kilohertz</td>
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<tr>
<td>KM</td>
<td>Kilometres</td>
</tr>
<tr>
<td>KMH</td>
<td>Kilometres per hour</td>
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<td>KPA</td>
<td>Kilopascals</td>
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<td>KT</td>
<td>Knots</td>
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<tr>
<td>KW</td>
<td>Kilowatts</td>
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<tr>
<td>L</td>
<td>Left (runway identification)</td>
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<tr>
<td>L</td>
<td>Low pressure area or the centre of low pressure (MET)</td>
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<tr>
<td>LAHSO</td>
<td>Land and hold short operations</td>
</tr>
<tr>
<td>LAN</td>
<td>Inland</td>
</tr>
<tr>
<td>LAT*</td>
<td>Latitude</td>
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<tr>
<td>LCA</td>
<td>Locally, location, located, local</td>
</tr>
<tr>
<td>LDA</td>
<td>Landing distance available</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<td>--------------</td>
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<tr>
<td>LDG</td>
<td>Landing</td>
</tr>
<tr>
<td>LDI</td>
<td>Landing direction indicator</td>
</tr>
<tr>
<td>LEN</td>
<td>Length</td>
</tr>
<tr>
<td>LF</td>
<td>Low frequency (30 to 300 KHZ)</td>
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<tr>
<td>LGT</td>
<td>Light, lighting</td>
</tr>
<tr>
<td>LGTD</td>
<td>Lighted</td>
</tr>
<tr>
<td>LIH</td>
<td>Light intensity high</td>
</tr>
<tr>
<td>LIL</td>
<td>Light intensity low</td>
</tr>
<tr>
<td>LIM</td>
<td>Light intensity medium</td>
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<tr>
<td>LIOL</td>
<td>Low intensity obstacle lights</td>
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<td>LIRL</td>
<td>Low intensity runway lights</td>
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<tr>
<td>LJR</td>
<td>Low jet route</td>
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<td>LLN</td>
<td>Low-level navigation (by the military)</td>
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<tr>
<td>LLO</td>
<td>Low-level operations (by the military)</td>
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<td>Local mean time</td>
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<td>LOC</td>
<td>Locally, location, located, local</td>
</tr>
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<td>LOE</td>
<td>Lane of entry</td>
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<td>LONG*</td>
<td>Longitude</td>
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<tr>
<td>LRG</td>
<td>Long range</td>
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<td>LSALT</td>
<td>Lowest safe altitude</td>
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<td>LTD</td>
<td>Limited</td>
</tr>
<tr>
<td>LUL</td>
<td>Lowest usable level</td>
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<tr>
<td>LV</td>
<td>Light and variable (wind)</td>
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<td>LVE</td>
<td>Leave, leaving</td>
</tr>
<tr>
<td>LVL</td>
<td>Level</td>
</tr>
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<td>LYR</td>
<td>Layer, layered</td>
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<td>Men and equipment</td>
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<td>MAG</td>
<td>Magnetic</td>
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<td>MAHF</td>
<td>Missed approach holding fix</td>
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<td>Maintenance</td>
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<td>Aeronautical maps and charts</td>
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<td>MAP</td>
<td>Missed approach procedure</td>
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<td>MAPT</td>
<td>Missed approach point</td>
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<td>March</td>
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<td>MAR</td>
<td>At sea</td>
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<tr>
<td>MATF</td>
<td>Missed approach turning fix</td>
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<td>MAX*</td>
<td>Maximum</td>
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<td>MBST</td>
<td>Microburst</td>
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<td>MDA</td>
<td>Minimum descent altitude</td>
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<tr>
<td>MDF</td>
<td>Medium frequency direction finding station</td>
</tr>
<tr>
<td>MEA†</td>
<td>Minimum en-route altitude</td>
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<td>Medical</td>
</tr>
<tr>
<td>MEHT</td>
<td>Minimum eye height over threshold</td>
</tr>
<tr>
<td>MET*</td>
<td>Meteorological, meteorology</td>
</tr>
<tr>
<td>METAR*</td>
<td>Aviation routine weather report (in aeronautical meteorological code)</td>
</tr>
<tr>
<td>METRADO</td>
<td>MET radar</td>
</tr>
<tr>
<td>MET REPORT</td>
<td>Aviation routine weather report</td>
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<tr>
<td>MF</td>
<td>Medium frequency (300 to 3000 KHZ)</td>
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<td>MHZ</td>
<td>Megahertz</td>
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<tr>
<td>MI</td>
<td>Shallow (met)</td>
</tr>
<tr>
<td>MIFG</td>
<td>Shallow fog</td>
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<tr>
<td>MIL</td>
<td>Military</td>
</tr>
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<td>MIN</td>
<td>Minutes</td>
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<tr>
<td>Abbreviation</td>
<td>Meaning</td>
</tr>
<tr>
<td>--------------</td>
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</tr>
<tr>
<td>MIOL</td>
<td>Medium intensity obstacle lights</td>
</tr>
<tr>
<td>MIRL</td>
<td>Medium intensity runway lights</td>
</tr>
<tr>
<td>MISC</td>
<td>Miscellaneous</td>
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<td>MKR</td>
<td>Marker radio beacon</td>
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<tr>
<td>MLJ</td>
<td>Military low jet</td>
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<td>MLJR</td>
<td>Military low jet route</td>
</tr>
<tr>
<td>MLS</td>
<td>Microwave landing system</td>
</tr>
<tr>
<td>MLW</td>
<td>Maximum landing weight</td>
</tr>
<tr>
<td>MM</td>
<td>Middle marker</td>
</tr>
<tr>
<td>MNM</td>
<td>Minimum</td>
</tr>
<tr>
<td>MNT</td>
<td>Monitor, monitoring, monitored</td>
</tr>
<tr>
<td>MNTN</td>
<td>Maintain, maintained, maintaining</td>
</tr>
<tr>
<td>MO</td>
<td>Meteorological office</td>
</tr>
<tr>
<td>MOA</td>
<td>Military operating area</td>
</tr>
<tr>
<td>MOC</td>
<td>Minimum obstacle clearance (required)</td>
</tr>
<tr>
<td>MOD</td>
<td>Moderate (to indicate the intensity of WX phenomena, interface or static reports; for example, MOD RA = moderate rain)</td>
</tr>
<tr>
<td>MON</td>
<td>Monday</td>
</tr>
<tr>
<td>MON</td>
<td>Above mountains</td>
</tr>
<tr>
<td>MOPS</td>
<td>Minimum operational performance standards</td>
</tr>
<tr>
<td>MOV</td>
<td>Move, moved, moving, movement</td>
</tr>
<tr>
<td>MOWP</td>
<td>Method of working plan</td>
</tr>
<tr>
<td>MPS</td>
<td>Metres per second</td>
</tr>
<tr>
<td>MRG</td>
<td>Medium range</td>
</tr>
<tr>
<td>MRP</td>
<td>ATS/MET reporting point</td>
</tr>
<tr>
<td>MS</td>
<td>Minus</td>
</tr>
<tr>
<td>MSA</td>
<td>Minimum sector altitude</td>
</tr>
<tr>
<td>MSG</td>
<td>Message</td>
</tr>
<tr>
<td>MSL</td>
<td>Mean sea level</td>
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<td>MSSR</td>
<td>Monopulse secondary surveillance radar</td>
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<td>Mountain</td>
</tr>
<tr>
<td>MTOW</td>
<td>Maximum take-off weight</td>
</tr>
<tr>
<td>MTP</td>
<td>Maximum tyre pressure</td>
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<td>MTW</td>
<td>Mountain waves</td>
</tr>
<tr>
<td>MVA</td>
<td>Minimum vector altitude</td>
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<td>MWO</td>
<td>Meteorological watch office</td>
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<td>MX</td>
<td>Mixed type of ice formation (white and clear)</td>
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<tr>
<td>N</td>
<td>North, north latitude</td>
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<tr>
<td>NAIPS</td>
<td>National Aeronautical Information Processing System</td>
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<td>NAP</td>
<td>Noise abatement procedures</td>
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<td>NAT</td>
<td>NAVAID training</td>
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<td>NAV</td>
<td>Navigation</td>
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<td>NAVAID</td>
<td>Navigation aid</td>
</tr>
<tr>
<td>NB</td>
<td>Northbound</td>
</tr>
<tr>
<td>NBFR</td>
<td>Not before</td>
</tr>
<tr>
<td>NC</td>
<td>No change</td>
</tr>
<tr>
<td>NCD</td>
<td>No cloud detected (by ceilometer) (in automated METAR/SPECI)</td>
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<tr>
<td>NDB</td>
<td>Non-directional Radio Beacon</td>
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<td>NDV</td>
<td>No-directional Variation reporting capability (by vismeter) (in automated METAR/SPECI)</td>
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<tr>
<td>NE</td>
<td>North-east</td>
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<tr>
<td>NEG</td>
<td>Negative, no, permission not granted, or that is not correct</td>
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<tr>
<td>NGT</td>
<td>Night</td>
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<tr>
<td>Abbreviation</td>
<td>Meaning</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
</tr>
<tr>
<td>NIL*</td>
<td>None</td>
</tr>
<tr>
<td>NIS</td>
<td>NAIPS internet service</td>
</tr>
<tr>
<td>NM</td>
<td>Nautical miles</td>
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<tr>
<td>NML</td>
<td>Normal</td>
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<td>NNE</td>
<td>North north-east</td>
</tr>
<tr>
<td>NNW</td>
<td>North north-west</td>
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<tr>
<td>NOF</td>
<td>International NOTAM office</td>
</tr>
<tr>
<td>NOZ†</td>
<td>Normal operating zone</td>
</tr>
<tr>
<td>NOTAM*</td>
<td>Notice to airmen</td>
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<tr>
<td>NOV</td>
<td>November</td>
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<tr>
<td>NPA</td>
<td>Non-precision approach</td>
</tr>
<tr>
<td>NR</td>
<td>Number</td>
</tr>
<tr>
<td>NS</td>
<td>Nimbostratus</td>
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<tr>
<td>NSC</td>
<td>Nil significant cloud</td>
</tr>
<tr>
<td>NSW</td>
<td>Nil significant weather</td>
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<tr>
<td>NTA</td>
<td>No TAF amendment</td>
</tr>
<tr>
<td>NTL</td>
<td>National</td>
</tr>
<tr>
<td>NTZ†</td>
<td>No transgression zone</td>
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<tr>
<td>NVFR</td>
<td>Night visual flight rules</td>
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<td>Night vision goggles (by the military)</td>
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<td>NW</td>
<td>North-west</td>
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<td>Next</td>
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<td>OBS</td>
<td>Observe, observed, observation</td>
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<td>OBSC</td>
<td>Obscure, obscured, obscuring</td>
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<td>OBST</td>
<td>Obstacle</td>
</tr>
<tr>
<td>OBSTR</td>
<td>Obstruction</td>
</tr>
<tr>
<td>OCA†</td>
<td>Oceanic control area</td>
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<tr>
<td>OCA</td>
<td>Obstacle clearance altitude</td>
</tr>
<tr>
<td>OCC</td>
<td>Occulting (light)</td>
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<td>OCNL</td>
<td>Occasional, occasionally</td>
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<tr>
<td>OCT</td>
<td>October</td>
</tr>
<tr>
<td>OCTA†</td>
<td>Outside control area</td>
</tr>
<tr>
<td>OCTR†</td>
<td>Outside control zone</td>
</tr>
<tr>
<td>OFZ</td>
<td>Obstacle free zone</td>
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<tr>
<td>OHD</td>
<td>Overhead</td>
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<tr>
<td>OK</td>
<td>We agreed, or it is correct</td>
</tr>
<tr>
<td>OLDI†</td>
<td>On line data interchange</td>
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<tr>
<td>OM</td>
<td>Outer marker</td>
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<tr>
<td>OPA</td>
<td>Opaque, white type of ice formation</td>
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<td>Open, opening, opened</td>
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<td>OPN</td>
<td>Operational notification message</td>
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<td>OPR</td>
<td>Operator, operate, operative, operating, operational</td>
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<tr>
<td>OPS</td>
<td>Operations</td>
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<tr>
<td>O/R</td>
<td>On request</td>
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<td>OT</td>
<td>Other times</td>
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<tr>
<td>OTLK</td>
<td>Outlook (in SIGMET messages for volcanic ash and tropical cyclones)</td>
</tr>
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<td>OTP</td>
<td>On top</td>
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<td>OUBD</td>
<td>Outboard</td>
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<td>OVC</td>
<td>Overcast</td>
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<tr>
<td>OW</td>
<td>Over water</td>
</tr>
<tr>
<td>P</td>
<td>Prohibited area (followed by identification)</td>
</tr>
<tr>
<td>PAL*</td>
<td>Pilot activated lighting</td>
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<tr>
<td>PANS</td>
<td>Procedures for air navigation services</td>
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<tr>
<td>PAPI*</td>
<td>Precision approach path indicator</td>
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<tr>
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<td>Description</td>
</tr>
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<td>--------------</td>
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<td>PAR</td>
<td>Precision approach radar</td>
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<td>Parallel</td>
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<td>PAX</td>
<td>Passengers</td>
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<td>Performance-based navigation</td>
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<tr>
<td>PCD</td>
<td>Proceed, proceeding</td>
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<tr>
<td>PCL</td>
<td>Pilot controlled lighting</td>
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<tr>
<td>PCN</td>
<td>Pavement classification number</td>
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<tr>
<td>PDC&lt;sup&gt;†&lt;/sup&gt;</td>
<td>Pre-departure clearance</td>
</tr>
<tr>
<td>PEC</td>
<td>Pressure error correction</td>
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<tr>
<td>PER</td>
<td>Performance</td>
</tr>
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<td>Permanent</td>
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<td>PH</td>
<td>Public holiday</td>
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<td>Preferred route</td>
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<td>PIB</td>
<td>Pre-flight information bulletin</td>
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<td>PILS</td>
<td>Practice ILS</td>
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<td>Parachute jumping exercise</td>
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<td>Ice pellets</td>
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<td>PLN</td>
<td>Flight plan</td>
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<tr>
<td>PLVL</td>
<td>Present level</td>
</tr>
<tr>
<td>PN</td>
<td>Prior notice required</td>
</tr>
<tr>
<td>PNR&lt;sup&gt;†&lt;/sup&gt;</td>
<td>Point of no return</td>
</tr>
<tr>
<td>PO</td>
<td>Dust devils</td>
</tr>
<tr>
<td>POB&lt;sup&gt;†&lt;/sup&gt;</td>
<td>[Number] persons on board</td>
</tr>
<tr>
<td>POSS</td>
<td>Possible</td>
</tr>
<tr>
<td>PPI&lt;sup&gt;†&lt;/sup&gt;</td>
<td>Plan position indicator</td>
</tr>
<tr>
<td>PPR</td>
<td>Prior permission required</td>
</tr>
<tr>
<td>PPSN</td>
<td>Present position</td>
</tr>
<tr>
<td>PRD</td>
<td>Prohibited, restricted and danger areas</td>
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<tr>
<td>PRFG</td>
<td>Aerodrome partially covered by fog (meteorological code)</td>
</tr>
<tr>
<td>PRI</td>
<td>Primary</td>
</tr>
<tr>
<td>PRKG</td>
<td>Parking</td>
</tr>
<tr>
<td>PRM</td>
<td>Precision runway monitoring</td>
</tr>
<tr>
<td>PROB*</td>
<td>Probable, probability</td>
</tr>
<tr>
<td>PROC</td>
<td>Procedure</td>
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<tr>
<td>PROV</td>
<td>Provisional</td>
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<tr>
<td>PS</td>
<td>Plus</td>
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<tr>
<td>PSG</td>
<td>Passing</td>
</tr>
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<td>PSN</td>
<td>Position</td>
</tr>
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<td>PSP</td>
<td>Pierced steel plank</td>
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<tr>
<td>PSR&lt;sup&gt;†&lt;/sup&gt;</td>
<td>Primary surveillance radar</td>
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<tr>
<td>PTBL</td>
<td>Portable</td>
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<tr>
<td>PTN</td>
<td>Procedure turn</td>
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<td>Private</td>
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<tr>
<td>PWR</td>
<td>Power</td>
</tr>
<tr>
<td>QNH&lt;sup&gt;†&lt;/sup&gt;</td>
<td>Altimeter subscale setting to obtain elevation or altitude</td>
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<tr>
<td>QUAD</td>
<td>Quadrant</td>
</tr>
<tr>
<td>R</td>
<td>Red</td>
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<tr>
<td>R</td>
<td>Restricted area (followed by number)</td>
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<tr>
<td>R</td>
<td>Right (runway system identification)</td>
</tr>
<tr>
<td>RA</td>
<td>Rain</td>
</tr>
<tr>
<td>RAD</td>
<td>Radius</td>
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<tr>
<td>RAFC</td>
<td>Regional area forecast centre</td>
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<td>RAG</td>
<td>Runway arresting gear</td>
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<tr>
<td>RAIM*</td>
<td>Receiver autonomous integrity monitoring</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
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<tr>
<td>RAPIC*</td>
<td>Radar picture (MET)</td>
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<td>RASC*</td>
<td>Regional AIS System Centre</td>
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<td>RCA</td>
<td>Reach cruising altitude</td>
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<td>Rescue Coordination Centre</td>
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<td>RCH</td>
<td>Reach, reaching</td>
</tr>
<tr>
<td>RCL</td>
<td>Runway centreline</td>
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<td>RCLL</td>
<td>Runway centreline lights</td>
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<td>Radial</td>
</tr>
<tr>
<td>RDO</td>
<td>Radio</td>
</tr>
<tr>
<td>RE</td>
<td>Recent (to qualify weather phenomena, for example RERA = recent rain)</td>
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<tr>
<td>REC</td>
<td>Receive, receiver, received</td>
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<tr>
<td>REDL</td>
<td>Runway edge lights</td>
</tr>
<tr>
<td>REF</td>
<td>Reference to, refer to</td>
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<td>REG</td>
<td>Registration</td>
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<td>Runway end lights</td>
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<td>Report, reported, reporting, reporting point</td>
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<td>Request, requested</td>
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<td>RERTE</td>
<td>Re-route</td>
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<td>Reserve fuel</td>
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<td>Review</td>
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<td>RH</td>
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<td>Reclearance in flight</td>
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<td>Radar/ADS-B information service</td>
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<td>RLLS</td>
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<td>Regional OPMET bulletin exchanges recommended practices (ICAO)</td>
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<td>Rate of descent</td>
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<td>ROFOR*</td>
<td>Route forecast (in aeronautical meteorological code)</td>
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<td>Runway point of intercept</td>
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<td>Radar position indicator</td>
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<td>Requirements</td>
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<td>Runway threshold identification lights</td>
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<td>Runway threshold light(s)</td>
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<td>Return, returned, returning</td>
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<td>Runway touchdown zone lights</td>
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<td>RVR†</td>
<td>Runway visual range</td>
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<td>Abbreviation</td>
<td>Definition</td>
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<td>RVSM</td>
<td>Reduced vertical separation minimum</td>
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<td>Simple approach lighting system</td>
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<td>Search and rescue</td>
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<td>Standards and recommended practices (ICAO)</td>
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<td>SARTIME*</td>
<td>Time search action required</td>
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<td>Standby</td>
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<td>South-east</td>
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<td>SEA</td>
<td>Sea (in connection with sea-surface temperature and state of the sea)</td>
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<td>Seconds</td>
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<td>Section, sector</td>
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<td>SELCAL*</td>
<td>Selective calling system</td>
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<td>SEP</td>
<td>September</td>
</tr>
<tr>
<td>SER</td>
<td>Service, servicing, served</td>
</tr>
<tr>
<td>SEV</td>
<td>Severe (for example, to qualify icing and turbulence report)</td>
</tr>
<tr>
<td>SFC</td>
<td>Surface</td>
</tr>
<tr>
<td>SFL</td>
<td>Sequenced flashing lights</td>
</tr>
<tr>
<td>SG</td>
<td>Snow grains</td>
</tr>
<tr>
<td>SH</td>
<td>Showers (followed by: RA = rain; SN = snow; PE = ice pellets; GR = hail; GS = small hail and/or snow pellets; or combinations thereof; for example, SHRASN = showers of rain and snow)</td>
</tr>
<tr>
<td>SHF</td>
<td>Super high frequency (3,000 to 30,000 MHZ)</td>
</tr>
<tr>
<td>SID*</td>
<td>Standard instrument departure</td>
</tr>
<tr>
<td>SIF</td>
<td>Selective identification</td>
</tr>
<tr>
<td>SIGMET*</td>
<td>Information concerning en-route weather phenomena which may affect the safety of aircraft operations</td>
</tr>
<tr>
<td>SIGWX</td>
<td>Significant weather</td>
</tr>
<tr>
<td>SIMUL</td>
<td>Simultaneous, simultaneously</td>
</tr>
<tr>
<td>SITREP</td>
<td>Situation report</td>
</tr>
<tr>
<td>SKC</td>
<td>Sky clear</td>
</tr>
<tr>
<td>SKED*</td>
<td>Schedule, scheduled</td>
</tr>
<tr>
<td>SLP</td>
<td>Speed limiting point</td>
</tr>
<tr>
<td>SLW</td>
<td>Slow, slowly</td>
</tr>
<tr>
<td>SMC†</td>
<td>Surface movement control</td>
</tr>
<tr>
<td>SMCV†</td>
<td>Surface movement control vehicles</td>
</tr>
<tr>
<td>SMR</td>
<td>Surface movement radar</td>
</tr>
<tr>
<td>SN</td>
<td>Snow</td>
</tr>
<tr>
<td>SNOWTAM*</td>
<td>A special series</td>
</tr>
<tr>
<td>SOC</td>
<td>Start of climb</td>
</tr>
<tr>
<td>SOT</td>
<td>Start of TORA (take-off)</td>
</tr>
<tr>
<td>SP</td>
<td>Single pilot</td>
</tr>
<tr>
<td>SPA</td>
<td>Sport aviation</td>
</tr>
<tr>
<td>SPI</td>
<td>Special position indicator</td>
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<tr>
<td>SPECI*</td>
<td>Aviation special weather (in aeronautical meteorological code)</td>
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<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>--------------</td>
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<tr>
<td>SPFIB</td>
<td>Specific preflight information bulletin</td>
</tr>
<tr>
<td>SPOT*</td>
<td>Spotwind</td>
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<tr>
<td>SQ</td>
<td>Squall</td>
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<tr>
<td>SR</td>
<td>Sunrise</td>
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<td>SRD</td>
<td>Standard radar departure</td>
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<td>SRG</td>
<td>Short range</td>
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<tr>
<td>SRR</td>
<td>Search and rescue region</td>
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<td>SRY</td>
<td>Secondary</td>
</tr>
<tr>
<td>SS</td>
<td>Sandstorm</td>
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<td>SS</td>
<td>Sunset</td>
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<tr>
<td>SSB</td>
<td>Single sideband</td>
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<td>SSE</td>
<td>South south-east</td>
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<tr>
<td>SSR</td>
<td>Secondary surveillance radar</td>
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<td>SST</td>
<td>Supersonic transport</td>
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<tr>
<td>SSW</td>
<td>South south-west</td>
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<td>ST</td>
<td>Stratus</td>
</tr>
<tr>
<td>STA</td>
<td>Straight-in approach</td>
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<tr>
<td>STAR*</td>
<td>Standard arrival route</td>
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<td>STD</td>
<td>Standard</td>
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<td>STF</td>
<td>Stratiform</td>
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<td>STN</td>
<td>Station</td>
</tr>
<tr>
<td>STNR</td>
<td>Stationary</td>
</tr>
<tr>
<td>STODA</td>
<td>Supplementary take-off distance</td>
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<td>STOL</td>
<td>Short take-off and landing</td>
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<td>STS</td>
<td>Status</td>
</tr>
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<td>STWL</td>
<td>Stopway light(s)</td>
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<td>SUBJ</td>
<td>Subject to</td>
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<td>SUN</td>
<td>Sunday</td>
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<tr>
<td>SUP</td>
<td>Supplement (AIP supplement)</td>
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<td>SUPPS</td>
<td>Regional supplementary procedures</td>
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<td>SVCBL</td>
<td>Serviceable</td>
</tr>
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<td>SVY</td>
<td>Survey operations</td>
</tr>
<tr>
<td>SW</td>
<td>South-west</td>
</tr>
<tr>
<td>SWS</td>
<td>Soft wet surface</td>
</tr>
<tr>
<td>SWY</td>
<td>Stopway</td>
</tr>
<tr>
<td>T</td>
<td>Bearing (true)</td>
</tr>
<tr>
<td>T</td>
<td>Temperature</td>
</tr>
<tr>
<td>TA</td>
<td>Transition altitude</td>
</tr>
<tr>
<td>TAC*</td>
<td>Terminal area chart</td>
</tr>
<tr>
<td>TACAN*</td>
<td>Tactical air navigation aid</td>
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<td>TAF*</td>
<td>Aerodrome forecast</td>
</tr>
<tr>
<td>TAIL*</td>
<td>Tailwind</td>
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<td>TAR</td>
<td>Terminal area surveillance area</td>
</tr>
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<td>TAS†</td>
<td>True airspeed</td>
</tr>
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<td>TAT*</td>
<td>Terminal area thunderstorm service (meteorological)</td>
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<td>TAX</td>
<td>Taxiing, Taxi</td>
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<td>TBA</td>
<td>To be advised</td>
</tr>
<tr>
<td>TC</td>
<td>Tropical cyclone</td>
</tr>
<tr>
<td>TCAC</td>
<td>Tropical cyclone advisory centre</td>
</tr>
<tr>
<td>TCAS*</td>
<td>Traffic alert and collision avoidance system (pronounced ‘tee-kas’)</td>
</tr>
<tr>
<td>TCH</td>
<td>Threshold crossing height</td>
</tr>
<tr>
<td>TCTA</td>
<td>Trans-continental control area</td>
</tr>
<tr>
<td>TCU</td>
<td>Towering cumulus</td>
</tr>
<tr>
<td>TDO</td>
<td>Tornado</td>
</tr>
<tr>
<td>TDZ</td>
<td>Touchdown zone</td>
</tr>
<tr>
<td>TECR</td>
<td>Technical reason</td>
</tr>
<tr>
<td>TEL</td>
<td>Telephone</td>
</tr>
<tr>
<td>TEMPO*</td>
<td>Temporary, temporarily</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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</tr>
<tr>
<td>TFC</td>
<td>Traffic</td>
</tr>
<tr>
<td>TFR</td>
<td>Terrain following radar (by the military)</td>
</tr>
<tr>
<td>TGL</td>
<td>Touch-and-go landing</td>
</tr>
<tr>
<td>TGS</td>
<td>Taxiing guidance system</td>
</tr>
<tr>
<td>THR</td>
<td>Threshold</td>
</tr>
<tr>
<td>THRU</td>
<td>Through</td>
</tr>
<tr>
<td>THU</td>
<td>Thursday</td>
</tr>
<tr>
<td>TIBA</td>
<td>Traffic information broadcasts by aircraft</td>
</tr>
<tr>
<td>TIL*</td>
<td>Until</td>
</tr>
<tr>
<td>TIP</td>
<td>Until past (followed by place name)</td>
</tr>
<tr>
<td>TKOF</td>
<td>Take-off</td>
</tr>
<tr>
<td>TL</td>
<td>Until</td>
</tr>
<tr>
<td>TLW</td>
<td>Time limited WIP (work in progress)</td>
</tr>
<tr>
<td>TMA†</td>
<td>Terminal control area</td>
</tr>
<tr>
<td>TN</td>
<td>Indicator for minimum temperature (MET – in TAF code form)</td>
</tr>
<tr>
<td>TNA</td>
<td>Turn altitude</td>
</tr>
<tr>
<td>TNH</td>
<td>Turn height</td>
</tr>
<tr>
<td>TNS</td>
<td>Transitional surface</td>
</tr>
<tr>
<td>TOC</td>
<td>Top of climb</td>
</tr>
<tr>
<td>TODA</td>
<td>Take-off distance available</td>
</tr>
<tr>
<td>TOP</td>
<td>Cloud top</td>
</tr>
<tr>
<td>TORA</td>
<td>Take-off run available</td>
</tr>
<tr>
<td>TP</td>
<td>Turning point</td>
</tr>
<tr>
<td>TR</td>
<td>Track</td>
</tr>
<tr>
<td>TRA</td>
<td>Temporary reserved airspace</td>
</tr>
<tr>
<td>TRA†</td>
<td>Temporary restricted area</td>
</tr>
<tr>
<td>TRAN</td>
<td>Transition</td>
</tr>
<tr>
<td>TRANS</td>
<td>Transmits, transmitter</td>
</tr>
<tr>
<td>TRL</td>
<td>Transition level</td>
</tr>
<tr>
<td>TROP</td>
<td>Tropopause</td>
</tr>
<tr>
<td>TS</td>
<td>Thunderstorm (followed by: RA = rain; SN = snow; PE = ice pellets; GR = hail; GS = small hail and/or snow pellets; or combinations thereof; for example TSRASN = thunderstorm with rain and snow)</td>
</tr>
<tr>
<td>TTF†</td>
<td>Trend type forecast</td>
</tr>
<tr>
<td>TUE</td>
<td>Tuesday</td>
</tr>
<tr>
<td>TURB</td>
<td>Turbulence</td>
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<tr>
<td>T-VASIS*</td>
<td>‘T’ visual approach slope indicator system (pronounced ‘tee-vasis’)</td>
</tr>
<tr>
<td>TWR</td>
<td>Aerodrome control tower, aerodrome control</td>
</tr>
<tr>
<td>TWY</td>
<td>Taxiway</td>
</tr>
<tr>
<td>TWYL</td>
<td>Taxiway link</td>
</tr>
<tr>
<td>TX</td>
<td>Indicator for maximum temperature (MET – in TAF code form)</td>
</tr>
<tr>
<td>TYP</td>
<td>Type of aircraft</td>
</tr>
<tr>
<td>TYPH</td>
<td>Typhoon</td>
</tr>
<tr>
<td>U</td>
<td>Until</td>
</tr>
<tr>
<td>UAB</td>
<td>Until advised by</td>
</tr>
<tr>
<td>UDF†</td>
<td>Uhf direction finding stations</td>
</tr>
<tr>
<td>UFN</td>
<td>Until further notice</td>
</tr>
<tr>
<td>UHDT</td>
<td>Unable higher due traffic</td>
</tr>
<tr>
<td>UHF†</td>
<td>Ultra high frequency (300 to 3,000 MHZ)</td>
</tr>
<tr>
<td>UIR</td>
<td>Upper flight information region</td>
</tr>
<tr>
<td>UL</td>
<td>Upper limits</td>
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<th>Description</th>
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<tr>
<td>UNA</td>
<td>Unable</td>
</tr>
<tr>
<td>UNAP</td>
<td>Unable to approve</td>
</tr>
<tr>
<td>UNLC</td>
<td>Unlicensed</td>
</tr>
<tr>
<td>UNL</td>
<td>Unlimited</td>
</tr>
<tr>
<td>UNREL</td>
<td>Unreliable</td>
</tr>
<tr>
<td>UP</td>
<td>Unknown precipitation</td>
</tr>
<tr>
<td>U/S</td>
<td>Unserviceable</td>
</tr>
<tr>
<td>UTA</td>
<td>Upper control area</td>
</tr>
<tr>
<td>UTC†</td>
<td>Coordinated universal time</td>
</tr>
<tr>
<td>VIS</td>
<td>Visibility</td>
</tr>
<tr>
<td>VLF</td>
<td>Very low frequency (3 to 30 MHz)</td>
</tr>
<tr>
<td>VLR</td>
<td>Very long range</td>
</tr>
<tr>
<td>VMC†</td>
<td>Visual meteorological conditions</td>
</tr>
<tr>
<td>VNC</td>
<td>Visual navigation chart</td>
</tr>
<tr>
<td>VOR†</td>
<td>VHF omni-directional radio range (OMNI)</td>
</tr>
<tr>
<td>VRB</td>
<td>Variable</td>
</tr>
<tr>
<td>VTC</td>
<td>Visual terminal chart</td>
</tr>
<tr>
<td>VTOL</td>
<td>Vertical take-off and landing</td>
</tr>
<tr>
<td>VV</td>
<td>Vertical visibility (MET – in METAR/SPECI and TAF code forms)</td>
</tr>
<tr>
<td>W</td>
<td>West, west longitude</td>
</tr>
<tr>
<td>W</td>
<td>White</td>
</tr>
<tr>
<td>WAC</td>
<td>World aeronautical chart – ICAO 1:1,000,000 (followed by name/title)</td>
</tr>
<tr>
<td>WAFC</td>
<td>World Area Forecast Centre</td>
</tr>
<tr>
<td>WATIR</td>
<td>Weather and terminal information reciter</td>
</tr>
<tr>
<td>WB</td>
<td>Westbound</td>
</tr>
<tr>
<td>WDI</td>
<td>Wind direction indicator</td>
</tr>
<tr>
<td>WDSPR</td>
<td>Widespread</td>
</tr>
<tr>
<td>WED</td>
<td>Wednesday</td>
</tr>
<tr>
<td>WEF</td>
<td>With effect from, effective from</td>
</tr>
<tr>
<td>WGS-84</td>
<td>World Geodetic System – 1984</td>
</tr>
<tr>
<td>WI</td>
<td>Within</td>
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<tr>
<td>WID</td>
<td>Width</td>
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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>VA</td>
<td>Volcanic ash</td>
</tr>
<tr>
<td>VAAC</td>
<td>Volcanic ash advisory centre</td>
</tr>
<tr>
<td>VAL</td>
<td>In valleys</td>
</tr>
<tr>
<td>VAR</td>
<td>Magnetic variation</td>
</tr>
<tr>
<td>VASIS*</td>
<td>Visual approach slope indicator system</td>
</tr>
<tr>
<td>VCY</td>
<td>Vicinity</td>
</tr>
<tr>
<td>VC</td>
<td>Vicinity of the aerodrome (followed by FG = fog, TS = thunderstorm, FC = funnel cloud, PO = dust/sand whirls, BLDU = blowing dust, BLSA = blowing sand or BLSN = blowing snow; e.g. VCFG = vicinity fog</td>
</tr>
<tr>
<td>VDF†</td>
<td>Vhf direction finding station</td>
</tr>
<tr>
<td>VER</td>
<td>Vertical</td>
</tr>
<tr>
<td>VFR†</td>
<td>Visual flight rules</td>
</tr>
<tr>
<td>VHF†</td>
<td>Very high frequency (30 to 300 MHz)</td>
</tr>
<tr>
<td>VIA</td>
<td>By way of</td>
</tr>
<tr>
<td>VIP†</td>
<td>Very important person</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Definition</td>
</tr>
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<td>--------------</td>
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<tr>
<td>WIE</td>
<td>With immediate effect, effective immediately</td>
</tr>
<tr>
<td>WILCO*</td>
<td>Will comply</td>
</tr>
<tr>
<td>WINTEM</td>
<td>Forecast upper wind and temperature at specified points (in aeronautical meteorological code)</td>
</tr>
<tr>
<td>WIP</td>
<td>Work in progress</td>
</tr>
<tr>
<td>WKN</td>
<td>Weaken, weakening</td>
</tr>
<tr>
<td>WNW</td>
<td>West north-west</td>
</tr>
<tr>
<td>WO</td>
<td>Without</td>
</tr>
<tr>
<td>WPT</td>
<td>Waypoint</td>
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<td>WRNG</td>
<td>Warning</td>
</tr>
<tr>
<td>WS</td>
<td>Wind shear</td>
</tr>
<tr>
<td>WSW</td>
<td>West south-west</td>
</tr>
<tr>
<td>WT</td>
<td>Weight</td>
</tr>
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<td>WTSPT</td>
<td>Water spout</td>
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<tr>
<td>WWW</td>
<td>World wide web</td>
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<td>Weather</td>
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<tr>
<td>X</td>
<td>Cross</td>
</tr>
<tr>
<td>XBAR</td>
<td>Crossbar (of approach lighting system)</td>
</tr>
<tr>
<td>XNG</td>
<td>Crossing</td>
</tr>
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<td>XS</td>
<td>Atmospherics</td>
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<td>Y</td>
<td>Yellow</td>
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<td>YCZ</td>
<td>Yellow caution zone</td>
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<td>YR</td>
<td>Your(s)</td>
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<td>Z</td>
<td>Coordinated universal time (in meteorological messages)</td>
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<th>Registration number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climb speed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Best rate ($V_y$)</td>
</tr>
<tr>
<td></td>
<td>Best angle ($V_x$)</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
</tr>
<tr>
<td>Best glide speed</td>
<td>Heavy</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Light</td>
</tr>
<tr>
<td>Stall speed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$0^\circ$ flap</td>
</tr>
<tr>
<td></td>
<td>Full flap</td>
</tr>
<tr>
<td>Take-off speed</td>
<td>Short field</td>
</tr>
<tr>
<td>Landing speed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Short field</td>
</tr>
<tr>
<td></td>
<td>Flapless</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
</tr>
<tr>
<td>Maximum gear extension speed</td>
<td></td>
</tr>
<tr>
<td>Maximum VFE flap extension speed (VFE)</td>
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<tr>
<td>Fuel capacity (usable)</td>
<td></td>
</tr>
<tr>
<td>Fuel flow</td>
<td>65% power</td>
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<tr>
<td></td>
<td>75% power</td>
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<tr>
<td>Weight</td>
<td>Basic empty</td>
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<tr>
<td></td>
<td>Maximum take-off</td>
</tr>
<tr>
<td>Maximum baggage weight</td>
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Are you safe to fly?

<table>
<thead>
<tr>
<th>I</th>
<th>llness</th>
<th>Are you physically well?</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>edication</td>
<td>Are you free from the effects of drugs?</td>
</tr>
<tr>
<td>S</td>
<td>tress</td>
<td>Are you free from significant stress?</td>
</tr>
<tr>
<td>A</td>
<td>lcohol</td>
<td>Are you free from the effects of alcohol?</td>
</tr>
<tr>
<td>F</td>
<td>atigue</td>
<td>Are you adequately rested?</td>
</tr>
<tr>
<td>E</td>
<td>ating</td>
<td>Have you eaten properly so you can work effectively?</td>
</tr>
</tbody>
</table>

Don’t fly if you’re not safe
Forced landing initial action

<table>
<thead>
<tr>
<th>Initial check</th>
<th>Field selection</th>
<th>FMOST</th>
<th>Mayday call and squawk 7700</th>
<th>Brief your passengers</th>
<th>Final actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Altitude</strong></td>
<td><strong>Wind</strong></td>
<td><strong>Fuel</strong></td>
<td><strong>Mayday call and squawk 7700</strong></td>
<td><strong>Brief your passengers</strong></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td>Hold</td>
<td>Determine direction</td>
<td>Check contents</td>
<td>Mayday Mayday Mayday Melbourne Centre This is ZFR ZFR ZFR Engine failure 3 nm west of Picton 4500 ft Landing in paddock</td>
<td>Close your passengers</td>
<td><strong>Mayday call and squawk 7700</strong></td>
</tr>
<tr>
<td><strong>Speed</strong></td>
<td><strong>Surroundings</strong></td>
<td><strong>Pump on</strong></td>
<td></td>
<td><strong>Inform passengers</strong></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td>Best glide speed</td>
<td>Power lines, trees</td>
<td>Primer locked</td>
<td></td>
<td>Close proximity if possible</td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td><strong>Mixture</strong></td>
<td><strong>Size and Shape</strong></td>
<td><strong>Mixture</strong></td>
<td></td>
<td><strong>Inform passengers</strong></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td>Rich</td>
<td>In relation to wind</td>
<td>Up and down range, leave rich</td>
<td></td>
<td>Close proximity if possible</td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td><strong>Carb</strong></td>
<td><strong>Surface and Slope</strong></td>
<td><strong>Oil</strong></td>
<td></td>
<td></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td>Full hot</td>
<td>Close proximity if possible</td>
<td>Temps green</td>
<td></td>
<td></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td><strong>Fuel</strong></td>
<td><strong>S(c)ivilisation</strong></td>
<td><strong>(mags)</strong></td>
<td></td>
<td></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td>On</td>
<td>Close proximity if possible</td>
<td>Left then right back to both</td>
<td></td>
<td></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td>Pump on</td>
<td><strong>Throttle</strong></td>
<td>Switch</td>
<td></td>
<td></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td>Change tanks</td>
<td>Up and down range, then close</td>
<td></td>
<td></td>
<td></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td><strong>Trim</strong></td>
<td><strong>Mags</strong></td>
<td><strong>Throttle</strong></td>
<td></td>
<td></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td>To best glide speed</td>
<td>Off</td>
<td></td>
<td></td>
<td></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td><strong>Mags</strong></td>
<td><strong>Harness</strong></td>
<td><strong>Master switch</strong></td>
<td></td>
<td></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td>Off</td>
<td>Tight</td>
<td>Off</td>
<td></td>
<td></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td><strong>Harness</strong></td>
<td><strong>Door</strong></td>
<td>Caution if flaps are electrically operated</td>
<td></td>
<td></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td><strong>Door</strong></td>
<td><strong>Master switch</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>Final actions</strong></td>
</tr>
<tr>
<td>As required</td>
<td>Off</td>
<td></td>
<td></td>
<td></td>
<td><strong>Final actions</strong></td>
</tr>
</tbody>
</table>

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Forced landing procedure

- High key 2500 ft AGL
- Engine failure point 4500 ft AGL
- Low key 1500 ft AGL
- Selected landing ground

If too high

If too low

If too high
## Light signals

<table>
<thead>
<tr>
<th>On ground</th>
<th>Light mode</th>
<th>In flight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorised to <strong>take off</strong> if pilot is satisfied that no collision risk exists</td>
<td>Green</td>
<td>Authorised to <strong>land</strong> if pilot is satisfied that no collision risk exists</td>
</tr>
<tr>
<td>Authorised to <strong>taxi</strong> if pilot is satisfied that no collision risk exists</td>
<td>Green flashing</td>
<td><strong>Return</strong> for landing</td>
</tr>
<tr>
<td><strong>Stop</strong></td>
<td><strong>Red</strong></td>
<td><strong>Give way</strong> to other aircraft <strong>Continue</strong> circling</td>
</tr>
</tbody>
</table>
| **Taxi clear of landing area**  
In use            | **Red flashing** | **Do not land**  
Aerodrome unsafe  |
| **Return** to starting point  
on aerodrome     | **White flashing** | **Do not land**  
Aerodrome unsafe  |
## Signals for the control of aerodrome traffic

<table>
<thead>
<tr>
<th>Ground signal</th>
<th><img src="#" alt="White cross" /></th>
<th><img src="#" alt="Double white cross" /></th>
<th><img src="#" alt="Horizontal white dumbbell" /></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>White cross</td>
<td>Double white cross</td>
<td>Horizontal white dumbbell</td>
</tr>
<tr>
<td><strong>Where displayed</strong></td>
<td>(a) Adjacent to wind direction indicator</td>
<td>Adjacent to wind direction indicator</td>
<td>Adjacent to wind direction indicator</td>
</tr>
<tr>
<td>(b) On manoeuvring area</td>
<td>Adjacent to wind direction indicator</td>
<td>Adjacent to wind direction indicator</td>
<td></td>
</tr>
<tr>
<td><strong>Meaning</strong></td>
<td>(a) Aerodrome completely unserviceable</td>
<td>Gliding operations in progress</td>
<td>Use only hard surface movement areas. Where there are sealed and gravel manoeuvring areas, use only the sealed surfaces. Where there are constructed gravel and natural surface manoeuvring areas, use only the gravel surfaces. (See ERSA FAC for any local information relating to the dumbbell signal)</td>
</tr>
<tr>
<td>(b) An area marked by a cross or crosses with the limit delineated by markers is unfit for use by aircraft</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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