

Revision 0

Air Traffic Services—Aerodrome Air Traffic Control

05 May 2010

General

Civil Aviation Authority (CAA) Advisory Circulars (ACs) contain information about standards, practices, and procedures that the Director has found to be an **acceptable means of compliance** with the associated rule.

Consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices, or procedures are found to be acceptable they will be added to the appropriate AC.

Purpose

This AC describes an acceptable means of compliance with the requirements relating to the provision of an aerodrome control service under Civil Aviation Rule Part 172 Subpart B, Subpart C and Subpart E.

Related Rules

This AC relates specifically to Civil Aviation Rule Part 172, and Part 71-Subpart C.

Change Notice

This is the initial issue of AC 172-2.

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1 General

1.1 Applicable Rules

1.1.1 The Civil Aviation Rules (CARs) that apply to the provision of an air traffic control (ATC) aerodrome control service are:

- (a) CAR 172.75 (Area and approach control services, regarding functions delegated to the aerodrome control unit under CAR 172.77):
- (b) CAR 172.77 (Aerodrome control service):
- (c) CAR 172.83 (Priorities):
- (d) CAR 172.87 (ATC clearances):
- (e) CAR 172.89 (Cruising levels):
- (f) CAR 172.91 (Deviation from an ATC clearance):
- (g) CAR 172.93 (Flight information service):
- (h) CAR 172.97 (Alerting service):
- (i) CAR 172.151 (Continued compliance)
- (j) CAR 172.159 (Suspension of VFR operations).

1.1.2 The rules applicable to airspace classification are contained in CAR Part 71.

1.1.3 These rules should not be read in isolation, as all applicable rules apply concurrently. For example, at a controlled aerodrome, the rules applicable to aerodrome control service need to be applied as well as the rules applicable to the class of airspace.

1.2 Prevention of Collision

1.2.1 The prime objective of ATC is to prevent collisions between aircraft, and on the manoeuvring area, between aircraft and obstructions.

1.2.2 When separation is applicable, it is provided by ATC in accordance with the prescribed minima referred to in rule 172.77 and Part 172 Subpart E and is achieved by the issuance of ATC clearances and instructions. In these situations ATC holds the primary responsibility for the prevention of collisions.

1.2.3 When separation is not applicable, prevention of collision is collaborative between ATC and each affected pilot. It is achieved by the provision of ATC clearances, instructions and traffic information that will enable each pilot, as far as is practicable, to comprehend the relative position of other relevant aircraft and, if necessary, to sight and avoid each other. ATC retains responsibility for passing (and updating as required) clearances, instructions, and traffic information throughout the provision of an air traffic service, particularly Aerodrome Control.

1.3 Level of Service

1.3.1 Controlled airspace does not equate to ATC separation in all cases. Entry to class C or D controlled airspace requires an ATC clearance which includes route and level instructions. The difference between these classifications is set out in the following table:

<i>Class C</i>	<i>Class D</i>
Separation is required between:	Separation is required between:
IFR Flights; and	IFR Flights; and
IFR and VFR Flights; and	
IFR and SVFR; and	IFR and SVFR; and
SVFR flights when the flight visibility is reported to be less than 5 km.	

Neither class C nor class D airspace requires ATC to provide separation between airborne VFR aircraft but issuance of a clearance supplemented by the provision of timely traffic information is intended to provide the pilot with sufficient information and time to manoeuvre safely and avoid the risk of collision.

1.3.2 A clearance for an aircraft to operate in controlled airspace should be only as specific and detailed as necessary to ensure that ATC can monitor the progress of flights, be aware of their relative positions and enable the provision of accurate and effective traffic information.

1.3.3 The level of air traffic service that is to be provided at an aerodrome depends on the classification of the airspace designated for the control zone (CTR). It is particularly important that the level of service is delivered consistently by every ATC unit. An inconsistent level of aerodrome control service may lead to a pilot misinterpreting the ATC separations being applied in a particular classification of airspace and, in the worst case, expect separation when none is provided.

1.3.4 Runway and wake turbulence separations are applied by aerodrome control to all flights regardless of their flight rules or the airspace classification.

2 Air Traffic Service within Control Zones

2.1 Aerodrome Control Service

2.1.1 An aerodrome control service is provided only within the vicinity of an aerodrome.

2.1.2 The 'vicinity of the aerodrome' may be dimensionally different to the CTR within which the aerodrome is located. The full extent of the 'vicinity of the aerodrome' is contained within the CTR. Refer Figure 1.

2.1.3 For the purposes of this advisory circular 'vicinity of the aerodrome' means an area around an aerodrome where aircraft carry out manoeuvres associated with entering, leaving, or operating within the aerodrome traffic circuit. Rule 172.77 requires ATC to "determine, from information received and visual observation, the relative positions of known aircraft to each other". The Aerodrome Controller, as far as practicable, needs to maintain a continuous watch on all air traffic on and in the vicinity of an aerodrome as well as vehicles and personnel on the

manoeuvring area. This watch is maintained primarily by visual observation, supplemented by radio communications, and augmented by surveillance technologies as appropriate.

The actual dimensions of the vicinity of an aerodrome and the aerodrome traffic circuit depend on the characteristics of the aircraft operating within the circuit. As a guide, the vicinity is not likely to extend horizontally further than 5NM (this may be less at some aerodromes owing to the dimensions of the CTR) and vertically 500ft above the highest promulgated circuit altitude.

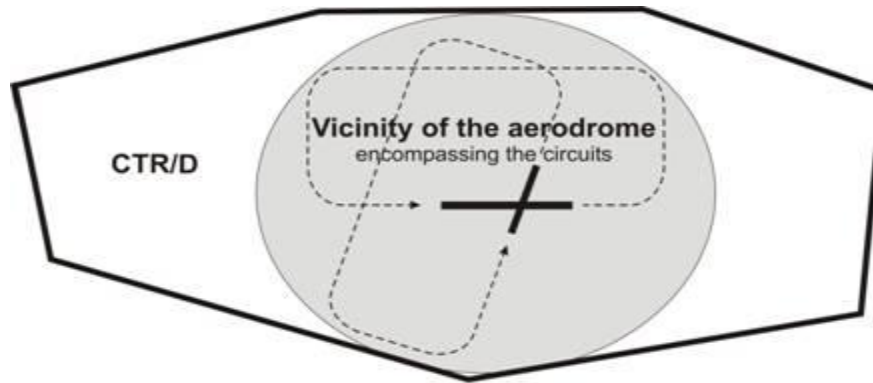


Figure 1: The 'vicinity of the aerodrome' (shaded area) encompasses the aerodrome traffic circuits.

The control zone (CTR) extends further out to encompass instrument procedures.

2.1.4 An aerodrome control service requires ATC to issue clearances, instructions and information to aircraft on and in the vicinity of an aerodrome for the purpose of:

- (a) preventing collisions between aircraft, and between aircraft and obstructions on the manoeuvring area; and
- (b) expediting and maintaining a safe and efficient flow of air traffic.

2.1.5 An aerodrome control service should manage the flow of air traffic in the vicinity of the aerodrome, creating a patterned and sequenced traffic configuration, in order to maintain a safe, orderly and expeditious flow of air traffic.

2.1.6 'Patterned' means aircraft being arranged to travel in a regular arrangement, which normally equates to an aerodrome traffic circuit. In general, this means aircraft following a pattern which maximises the incidence of same direction tracks so pilots have time to identify any conflicting traffic and manoeuvre appropriately. Therefore, a single aerodrome pattern minimises the incidence of multiple aerodrome traffic circuits that have conflicting crossing or reciprocal tracks. In most cases, the pattern will depend on the designated runway-in-use.

2.1.7 'Sequenced' means the assignment of an order for landing or take off and the minimisation of speed differential between aircraft. It does not mean spacing or separation by a particular distance.

2.1.8 ATC must issue clearances, instructions and information in a timely manner that can be acted upon by the pilot. The pilot needs to be able to reasonably sight traffic in a position and in time to take action in order to avoid collision without sudden or violent manoeuvres.

2.1.9 ATC may issue a clearance or an instruction that separates or segregates approaching aircraft from a congested aerodrome traffic circuit, until such time at which traffic information can be provided and can be acted upon by the pilot. In such cases, the pilot should be instructed to report at a position where circuit joining and runway sequence instructions together with traffic information, including information on which aircraft to follow can be issued. ATC may hold joining aircraft clear of the circuit if integration cannot be achieved safely. Generally, this should not be necessary for an approaching VFR aircraft, as these can be instructed to join a long final, a wider circuit, or overhead the aerodrome before integration into the aerodrome traffic circuit.

2.1.10 Sequence instructions to aircraft, accompanied with appropriate information about air traffic will allow the pilot to sight and maintain sufficient spacing against potentially conflicting traffic.

2.1.11 When 2 or more aircraft are in the circuit at the same time ATC should advise the pilots of their position in the landing sequence and of the aircraft immediately ahead of them, including an instruction to follow or position behind the aircraft concerned.

2.1.12. In most cases, the pilot will be able to determine when to make adjustments to the aircraft's flight path based on the sequence instructions and traffic information provided by ATC, rather than by an instruction from ATC.

2.1.13 ATC may give instructions to airborne aircraft that achieve the future intent of runway or wake turbulence separation; the pilot remains responsible for the actual airborne spacing.

2.2 Approach Control Service

2.2.1 An approach control service is normally provided in conjunction with an aerodrome control service. The provision of an approach control service requires (as a minimum) the designation of a CTR. Service provided within a CTR is dependent on the airspace classification and type of flight.

2.2.2 Provision of air traffic services within the CTR is usually delegated to the aerodrome control unit by the appropriate approach control unit. The aerodrome control unit provides:

(a) Traffic information:

- in class C airspace, to VFR flights about other VFR flights, together with traffic avoidance advice on request; and
- in class D airspace, to IFR about VFR flights and to VFR flights about other VFR flights, together with traffic avoidance advice on request.

(b) Separation (vertical, geographical or visual) between:

- IFR flights in class C and D airspace;
- IFR flights and VFR flights in class C airspace;
- IFR flights and Special VFR flights in class C and D airspace; and
- special VFR flights when the flight visibility is reported to be less than 5 km in class C and D airspace.

3 Traffic Information

3.1 General

3.1.1 Traffic information should be:

- (a) timely; and
- (b) accurate; and
- (c) sufficient in its detail; and
- (d) able to be acted upon by the pilot to see and avoid other traffic.

3.1.2 ATC should manage the level of traffic to enable traffic information to be passed in accordance with paragraph 3.1.1.

3.1.3 Traffic information is not required when there is reasonable assurance that flights will not come into such proximity to create a collision hazard or the intended flight paths will not be affected. In addition, mutual traffic information does not have to be provided in all cases, such as where one aircraft is not going to be affected by the other aircraft. For example, traffic information would not normally be required to be given to a leading aircraft about the aircraft following.

3.1.4 In the case of regular operations, a Memorandum of Understanding (MOU) between the ATC unit and appropriate organisations, such as aircraft operators and the airport operator, may be established to set out operating rules. This MOU may include the understanding that provision of detailed position and altitude information about each and every aircraft may not always be possible, and the requirement for pilots of such aircraft to maintain a listening watch on the aerodrome control frequency in order to keep abreast of the traffic situation.

3.2 Clearances and Instructions

When separation is not applicable, ATC clearances should ensure that there is no immediate risk of collision. At the same time, clearances and instructions should minimise the need for complex or lengthy transmissions, facilitate timely sighting of traffic, and minimise the necessity for pilot sighting and avoidance action. Note that in the same radiotelephony transmission the aerodrome controller is providing an ATC service (instructions) and a flight information service (traffic information), in accordance with ICAO Annex 11, Chapter 4.

3.3 Application

In order to facilitate the provision of traffic information and provide a safe and expeditious flow of air traffic, ATC may instruct a pilot to fly along a route, within an area, or at a level. These procedures may reduce the number of conflicts and, as a consequence, reduce the amount of traffic information required to be passed to pilots. Such instructions should:

- (a) consider conditions affecting sighting of traffic in time to avoid a collision such as:
 - relative speed;
 - lighting conditions including the position of the sun;
 - amount or nature of cloud in the area;
 - visual background.

- (b) consider the difficulties IFR pilots may have in seeing and avoiding VFR traffic in circumstances such as:
- transition from IMC to VMC, and vice versa;
 - restricted visibility due to aircraft attitude on departure;
 - restricted manoeuvrability of medium or heavy aircraft in the arrival or departure phases;
 - high workload in the arrival and departure phases.

Note: ATC must ensure that level instructions to VFR flights contain either:

- (a) the maximum permitted altitude followed by the phrase "OR BELOW"; or
- (b) the minimum permitted altitude followed by the phrase "OR ABOVE"; or
- (c) where a flight is required to maintain flight at a specific level, that level followed by the phrase "VFR"; or
- (d) where a flight is required to maintain flight between two specific levels, those levels followed by the phrase "VFR".

ATC should exercise caution when assigning levels below the nominal altitudes of the Table of Cruising levels or Magnetic Track Altitude Requirements (AIPNZ ENR 1.7-10) in order that they do not invite the pilot to violate the provisions of rules relating to minimum heights and meteorological conditions.

Although rule 172.89(a)(2) permits VFR flights to be assigned IFR levels, ATC should append "VFR" to the level to reinforce pilot requirement to maintain VMC.

3.4 Use of Preferred VFR Arrival/Departure Procedures at Aerodromes

3.4.1 Where traffic volume or complexity in the vicinity of the aerodrome makes the passing of traffic information difficult it is appropriate that published VFR Arrival and Departure procedures, acceptable to the Director, be implemented to reduce the amount of traffic information that is required to be passed and to manage the workload. Such procedures should:

- (a) minimise information overload, particularly in the case of VFR training operations permitted to operate on random routes within a specified portion of controlled airspace:
- (b) consider the difficulty of pilots avoiding traffic such as balloons, gliders and parachutes which may behave unpredictably or be unable to manoeuvre to avoid a collision:
- (c) minimise the need for the exchange of traffic information between aerodrome and approach control units for arriving or departing IFR flights.

3.4.2 Where possible, a circular flow of traffic should be established to facilitate an orderly flow of traffic entering/leaving the circuit.

3.5 Traffic Avoidance Advice

3.5.1 Traffic avoidance advice is an enhancement of traffic information.

3.5.2 In classes C and D airspace, traffic avoidance advice is provided when requested by pilots. ATC may advise the pilot of a route or an altitude that would be expected to be clear of the traffic. As an advisory, the radiotelephony term 'SUGGEST' is used as a prefix to the action in the transmission. However, if ATC observes that an aircraft in the aerodrome traffic circuit was

manoeuvring so as to be in dangerous proximity to another aircraft, ATC would issue appropriate instructions for the purpose of preventing collisions, in accordance with rule 172.77(a)(2).

3.5.3 The provision of traffic avoidance advice is intended to assist pilots but does not absolve them of the responsibility to avoid collision with other aircraft or to remain in appropriate meteorological flight conditions.

4 Suspension of VFR Operations

ATC may suspend one or all VFR operations under rule 172.159 for safety reasons, which may include a high ATC workload.

5 Transponder Mandatory Airspace

5.1 General

In New Zealand, all controlled airspace, including CTR, is designated as transponder mandatory (TM). Under rule 91.247(c), ATC may authorise aircraft without a fully operating transponder to operate within TM controlled airspace.

5.2 Non-transponder Operations in Control Zone

ATC may authorise non-transponder operations to proceed in the CTR when the non-transponder aircraft does not conflict with aircraft known or believed to be carrying ACAS. Aircraft not carrying an operable transponder are kept on routes or in portions of controlled airspace that are separated from ACAS aircraft. Aerodrome Controllers should exercise caution before authorising non-transponder operations in the CTR.

6 ATS Surveillance

6.1 ATS Surveillance in Towers

6.1.1 ATC may use radar (or other means of surveillance) to support an aerodrome control service. In this case, the use of ATS surveillance should be limited to establishing the position of aircraft and confirming the application of geographical, composite visual or vertical separation, or assisting in the provision of a flight information service.

6.1.2 The primary information being used in aerodrome control service is visual observation of circuit traffic and other aircraft operating in the vicinity of the aerodrome. The use of radar or other forms of surveillance should not be allowed to distract or prevent ATC from fulfilling the imperative of maintaining a continuous visual observation of aerodrome operations as far as practicable.