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## MCAR-2 Rules of the Air

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**Maldives Civil Aviation Authority**  
**Republic of Maldives**

**Maldivian Civil Aviation Regulations**

# **MCAR-2 Rules of the Air**

**Issue 4.00, 20 February 2025**

## **Foreword**

Maldives Civil Aviation Authority, in exercise of the powers conferred on it under Articles 5 and 6 of the Maldives Civil Aviation Authority Act 2/2012 has developed this Regulation.

This Regulation shall be cited as 'MCAR 2 – Rules of the Air' and shall come into force on 20<sup>th</sup> February 2025.

Existing aviation requirements in the field of Air Navigation as listed in MCAR-2 Rules of the Air dated 15<sup>th</sup> January 2025 will be repealed as of 20<sup>th</sup> February 2025.

Definitions of the terms and abbreviations used in this Regulation, unless the context requires otherwise, are in MCAR-1 Definitions and Abbreviations.



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## CHAPTER 1 DEFINITIONS

Definitions of the terms and abbreviations used in this regulation, unless the context requires otherwise, are in MCAR-1 Definitions and Abbreviations.

*Note 1— Throughout the text of this document the term “service” is used as an abstract noun to designate functions, or service rendered; the term “unit” is used to designate a collective body performing a service.*

**Current flight plan (CPL).**

The flight plan, that reflects changes to the filed flight plan, if any, by subsequent ATC clearances.

**Filed flight plan (FPL or eFPL).**

The latest flight plan as submitted by pilot, an operator or a designated representative, for use by ATS units.

*Note. — The FPL denotes a filed flight plan exchanged using aeronautical fixed service while eFPL denotes a filed flight plan exchanged using FF-ICE services. The eFPL allows for the exchange of additional information not contained within the FPL.*

**Flight plan.**

Specified information relative to an intended flight or portion of a flight of an aircraft.

*Note 1. — The term flight plan may be prefixed by the words “preliminary”, “filed”, “current” or “operational” to indicate the context and different stages of a flight.*

*Note 2. — When the word “message” is used as a suffix to this term, it denotes the content and format of the flight plan data as transmitted.*

## **CHAPTER 2      APPLICABILITY OF THE RULES OF THE AIR**

### **2.1      Territorial application of the rules of the air**

2.1.1      The rules of the air contained in this MCAR, shall apply to all aircraft flying over Maldivian Territory and aircraft bearing the Maldivian nationality and registration marks, wherever they may be, to the extent that they do not conflict with the rules published by the State having jurisdiction over the territory overflown.

2.1.2      The Rules of the Air as contained in the Annex 2 to the Convention on International Civil Aviation shall apply, without exception to aircraft engaged in flight operations over those portions of high seas for which the responsibility for the provision of ATS has been delegated to Maldives under the Regional Air Navigation Agreement.

*Note 1. — The phrase “regional air navigation agreement” refers to an agreement approved by the Council of ICAO normally on the advice of a Regional Air Navigation Meeting.*

2.1.3      The “Appropriate ATS Authority” within the territory of Maldives and over those portions of high seas where Maldives has accepted the responsibility for provision of air traffic services pursuant to regional air navigation agreement is the relevant authority designated by Maldives Civil Aviation Authority.

### **2.2      Compliance with the rules of the air**

2.2.1      A pilot in command of an aircraft either in flight or on the movement area of an aerodrome shall comply with the general rules and, in addition, when in flight, shall comply with either the:

- a)      the visual flight rules; or
- b)      the instrument flight rules

2.2.2      A pilot in command of an aircraft shall, when operating under visual flight rules or instrument flight rules in classified air traffic services airspaces, comply with the requirements specified for such airspaces

2.2.3      A pilot may elect to fly in accordance with instrument flight rules in visual meteorological conditions or may be required to do so by the appropriate ATS authority.

### **2.3      Responsibility for compliance with the rules of the air**

2.3.1      Responsibility of pilot-in-command

2.3.1.1      The pilot-in-command of an aircraft shall, whether manipulating the controls or not, be responsible for the operation of the aircraft in accordance with these Regulations, except that the pilot-in-command may depart from these Regulations in circumstances that render such departure absolutely necessary in the interests of safety.

2.3.1.2      Nothing in these rules relating to right of way, or action to be taken by a pilot-in-command of an aircraft shall exonerate a pilot from the consequences of any neglect to maintain a proper look out or neglect of any precaution required by the practice of good airmanship.

### 2.3.2 Pre-flight action

- 2.3.2.1 The pilot-in-command of an aircraft before beginning a flight, shall become familiar with all available information appropriate to the intended operation.
- 2.3.2.2 The pilot-in-command shall in addition to 2.3.3.1, include a careful study of available current weather reports and forecasts, for flights away from the vicinity of an aerodrome and for all flights flying in accordance with instrument flight rules, taking into consideration fuel requirements and an alternative course of action if the flight cannot be completed as planned.

## 2.4 Authority of pilot-in-command of an aircraft

- 2.4.1 The pilot-in-command of an aircraft shall have final authority as to the disposition of the aircraft while in command.

## 2.5 Problematic use of psychoactive substances

- 2.5.1 A safety-sensitive person whose function is critical to the safety of aviation shall not undertake that function while under the influence of any psychoactive substance, by reason of which human performance is impaired.
- 2.5.2 A person referred to in 2.5.1 shall not engage in any kind of problematic use of substances.
- 2.5.3 A person shall not act as a member of a flight crew of an aircraft while under the influence of intoxicating liquor or narcotics, or drugs, or medication.

## **CHAPTER 3      GENERAL RULES**

### **3.1      Protection of persons and property**

3.1.1      Negligent or reckless operation of aircraft.

3.1.1.1    A person shall not willfully operate an aircraft, negligently or recklessly, in a manner so as to endanger life or property of others.

3.1.2      Minimum heights

3.1.2.1    Aircraft shall not be flown over the congested areas of cities, towns or settlements or over an open-air assembly of persons, unless at such a height as will permit, in the event of an emergency arising, a landing to be made without undue hazard to persons or property on the surface, except when necessary for take-off or landing, or except by permission from the CAA.

*Note – See 4.6 for minimum heights for VFR flights and 5.1.2 for minimum levels for IFR flights.*

3.1.3      Cruising levels

3.1.3.1    The cruising levels at which a flight or a portion of a flight is to be conducted shall be in terms of:

- a)    Flight levels, for flights at or above the lowest usable flight level or, where applicable, above the transition altitude
- b)    Altitudes, for flights below the lowest usable flight level or, where applicable, at or below the transition altitude.

3.1.4      Dropping and Spraying

3.1.4.1    Nothing shall be dropped or sprayed from an aircraft in flight except under conditions prescribed by the CAA and as indicated by the relevant information, advice and/ or clearance from the Air Traffic Services Unit.

3.1.5      Towing

3.1.5.1    No aircraft or object shall be towed by an aircraft, except in accordance with requirements prescribed by the CAA and as indicated by the relevant information, advice and/ or clearance from the Air Traffic Services Unit.

3.1.6      Parachute descents

3.1.6.1    Parachute descents, other than emergency descents, shall not be made except under conditions prescribed by the CAA and as indicated by the relevant information, advice and/ or clearance from the Air Traffic Services Unit.

3.1.6.2    Parascending parachute operations shall not be performed unless permitted by and conducted in accordance with the written specifications of the CAA.

3.1.7      Acrobatic flight

3.1.7.1    A person shall not fly an aircraft acrobatically except under conditions prescribed by the CAA and as indicated by relevant information, advice or clearance from the appropriate air traffic services unit.

3.1.7.2 A person shall not operate an aircraft—

- a) in acrobatic flight—
  - 1. over any city, town or settlement;
  - 2. over an open-air assembly of persons;
  - 3. below an altitude of 1,500 feet above the surface; or
  - 4. when the flight visibility is less than five kilometers; or
- b) in manoeuvres exceeding a bank of sixty degrees or pitch of thirty degrees from level flight attitude unless all occupants of the aircraft are wearing parachutes packed by a qualified parachute rigger in the past twelve months.

3.1.8 Formation flights

3.1.8.1 An aircraft shall not be flown in such proximity to other aircraft as to create a collision hazard and shall not be flown in formation with one or more other aircraft except by prearrangement among the pilots-in-command of the aircraft taking part in the flight and, for formation flight in controlled airspace, in accordance with the conditions prescribed by the appropriate ATS Authority. These conditions shall include the following:

- a) the formation operates as a single aircraft with regard to navigation and position reporting;
- b) separation between aircraft in the flight shall be the responsibility of the flight leader and the pilots-in-command of the other aircraft in the flight and shall include periods of transition when aircraft are manoeuvring to attain their own separation within the formation and during join-up and breakaway; and
- c) a distance not exceeding 1 km (0.5 NM) laterally and longitudinally and 30 m (100 ft) vertically from the flight leader shall be maintained by each aircraft.

3.1.9 Remotely piloted aircraft

3.1.9.1 A person shall operate a remotely piloted aircraft in such a manner as to minimize hazards to persons, property or other aircraft and in accordance with the conditions specified in Appendix 4.

3.1.10 Unmanned free balloons

3.1.10.1 A person shall operate an unmanned free balloon in such a manner as to minimize hazards to persons, property, or other aircraft and in accordance with the conditions specified in Appendix 5.

3.1.11 Prohibited areas and restricted areas

3.1.11.1 An Aircraft shall not be flown in a prohibited, or in a restricted area within Maldives, particulars of which have been duly published either in the Aeronautical Information Publication, Notice to Airmen, or communicated by an Air Traffic Services unit by any other mean except in accordance with the conditions of the restrictions or by permission of CAA.

## 3.2 Avoidance of collisions

The pilot in command of aircraft is responsible for taking avoidance action and such other action including manoeuvres based on resolution advisories provided by Airborne Collision Avoidance System (ACAS) equipment to avert collision.

*Note 1 – Operating procedures for use of ACAS detailing the responsibilities of the pilot-in-command are contained in PANS-OPS (Doc 8168), Volume I, Part III, Section 3, Chapter 3.*

*Note 2 – Carriage requirements for ACAS equipment are addressed in MCAR AIR OPS.*

### 3.2.1 Proximity

3.2.1.1 A person shall not operate an aircraft in such proximity to other aircraft as to create a collision hazard.

### 3.2.2 Right-of-way

The pilot-in-command of an aircraft that has the right-of-way shall maintain the aircraft heading and speed.

3.2.2.1 An aircraft that is obliged by the following rules to keep out of the way of another shall avoid passing over, or under, and shall not cross ahead of the other aircraft unless crossing well clear and takes into account the effect of aircraft wake turbulence.

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

3.2.2.3 *Converging:* When two aircraft are converging at approximately the same level, the aircraft that has the other on its right shall give way, except as follows:

- a) power-driven heavier-than-air aircraft shall give way to airships, gliders and balloons;
- b) airships shall give way to gliders and balloons;
- c) gliders shall give way to balloons;
- d) power-driven aircraft shall give way to aircraft which are seen to be towing other aircraft or objects.

3.2.2.4 *Overtaking:* An overtaking aircraft is an aircraft that approaches another from the rear on a line forming an angle of less than 70 degrees with the plane of symmetry of the latter, i.e. is in such a position with reference to the other aircraft that at night it should be unable to see either of the aircraft's left (port) or right (starboard) navigation lights. 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.

### 3.2.2.5 *Landing:*

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

3.2.2.5.2 When two or more heavier-than-air aircraft are approaching an aerodrome for the purpose of landing; aircraft at the higher level shall give way to aircraft at the lower level,

but the latter shall not take advantage of this rule to cut in, in front of another which is in the final stages of an approach to land, or to overtake that aircraft. Nevertheless, power-driven heavier-than-air aircraft shall give way to gliders.

3.2.2.5.3 *Emergency landing:* An aircraft that is aware that another is compelled to land shall give way to that aircraft.

3.2.2.6 *Taking off:* An aircraft taxiing on the manoeuvring area of an aerodrome shall give way to aircraft taking off or about to take off.

3.2.2.7 *Surface movement of aircraft:*

3.2.2.7.1 In case of danger of collision between two aircraft taxiing on the movement area of an aerodrome the following shall apply:

- a) When two aircraft are approaching head on, or approximately so, each shall stop or where practicable alter its course to the right so as to keep well clear;
- b) When two aircraft are on a converging course, the one which has the other on its right shall give way;
- c) An aircraft which is being overtaken by another aircraft shall have the right-of-way and the overtaking aircraft shall keep well clear of the other aircraft.

*Note. — For the description of an overtaking aircraft see 3.2.2.4.*

3.2.2.7.2 An aircraft taxiing on the maneuvering area shall stop and hold at all runway-holding positions unless otherwise authorized by the aerodrome control tower.

*Note – For runway-holding position markings and related signs, see MCAA Air Safety Circular No. ASC 139-5.*

3.2.2.7.3 An aircraft taxiing on the manoeuvring area shall stop and hold at all lighted stop bars and may proceed further when the lights are switched off.

3.2.3 Lights to be displayed by aircraft

*Note 1 – The characteristics of lights intended to meet the requirements of 3.2.3 for aeroplanes are specified in ICAO Annex 8 to the Convention on International Civil Aviation. Specifications for navigation lights for aeroplanes are contained in the Appendices to Parts I and II of ICAO Annex 6 to the convention on International Civil Aviation. Detailed technical specifications for lights for aeroplanes are contained in Volume II, Part A, Chapter 4 of the Airworthiness Manual (Doc 9760) and for helicopters in Part A, Chapter 5 of that document.*

*Note 2 – In the context of 3.2.3.2 c) and 3.2.3.4 a) an aircraft is understood to be operating when it is taxiing or being towed or is stopped temporarily during the course of taxiing or being towed.*

3.2.3.1 An aircraft in flight shall display light as provided by 3.2.3.5, from sunset to sunrise or during any other period which may be prescribed by the CAA:

- a) anti-collision lights intended to attract attention to the aircraft; and
- b) navigation lights intended to indicate the relative path of the aircraft to an observer and other lights shall not be displayed if they are likely to be mistaken for these lights.

*Note – Lights fitted for other purposes, such as landing lights and airframe floodlights, may be used in addition to the anti-collision lights to enhance aircraft conspicuity.*

3.2.3.2 Except as provided by 3.2.3.5, from sunset to sunrise or during any other period prescribed by the CAA:

- a) all aircraft moving on the movement area of an aerodrome shall display navigation lights intended to indicate the relative path of the aircraft to an observer and other lights shall not be displayed if they are likely to be mistaken for these lights;
- b) unless stationary and otherwise adequately illuminated, all aircraft on the movement area of an aerodrome shall display lights intended to indicate the extremities of their structure;
- c) all aircraft operating on the movement area of an aerodrome shall display lights intended to attract attention to the aircraft; and
- d) all aircraft on the movement area of an aerodrome whose engines are running shall display lights which indicate that fact.

*Note.— If suitably located on the aircraft, the navigation lights referred to in 3.2.3.1 b) may also meet the requirements of 3.2.3.2 b). Red anti-collision lights fitted to meet the requirements of 3.2.3.1 a) may also meet the requirements of 3.2.3.2 c) and 3.2.3.2 d) provided they do not subject observers to harmful dazzle.*

3.2.3.3 Except as provided by 3.2.3.5, all aircraft in flight and fitted with anti-collision lights to meet the requirement of 3.2.3.1 a) shall display such lights also outside the period specified in 3.2.3.1.

3.2.3.4 Except as provided by 3.2.3.5, all aircraft:

- a) operating on the movement area of an aerodrome and fitted with anti-collision lights to meet the requirement of 3.2.3.2 c); or
- b) on the movement area of an aerodrome and fitted with lights to meet the requirement of 3.2.3.2 d); shall display such lights also outside the period specified in 3.2.3.2.

3.2.3.5 A pilot shall be permitted to switch off or reduce the intensity of any flashing lights fitted to meet the requirements of 3.2.3.1, 3.2.3.2, 3.2.3.3 and 3.2.3.4 if they do or are likely to:

- a) adversely affect the satisfactory performance of duties; or
- b) subject an outside observer to harmful dazzle.

3.2.4 Simulated Instrument flights

A person shall not operate an aircraft in simulated instrument flight conditions unless:

- a) fully functioning dual controls are installed in the aircraft; and
- b) A qualified pilot occupies a control seat to act as safety pilot for the person who is flying under simulated instrument conditions.
- c) the safety pilot has adequate vision forward and to each side of the aircraft, or a competent observer in communication with the safety pilot shall occupy a position



in the aircraft from which the observer's field of vision adequately supplements the vision of the safety pilot.

### 3.2.5 Operation on and in the vicinity of an aerodrome

3.2.5.1 A pilot in command of an aircraft operating on, or in the vicinity of an aerodrome shall, whether or not within an aerodrome traffic zone:

- a) observe other aerodrome traffic for the purpose of avoiding collision;
- b) conform with or avoid the pattern of traffic formed by other aircraft in operation;
- c) make all turns to the left, when approaching for a landing and after taking off, unless otherwise instructed;
- d) land and take off into the wind unless safety, the runway configuration, or air traffic considerations determine that a different direction is preferable.

*Note 1. — See 3.6.5.1.*

### 3.2.6 Water operations

*Note – In addition to the provisions of 3.2.6.1 of this MCAR, rules set forth in the International Regulations for Preventing Collisions at Sea, developed by the International Conference on Revision of the International Regulations for Preventing Collisions at Sea (London, 1972) may be applicable in certain cases.*

3.2.6.1 When two aircraft or an aircraft and a vessel are approaching one another and there is a risk of collision, the aircraft shall proceed with careful regard to existing circumstances and conditions including the limitations of the respective craft.

3.2.6.1.1 *Converging:* An aircraft which has another aircraft or a vessel on its right shall give way so as to keep well clear.

3.2.6.1.2 *Approaching head-on:* An aircraft approaching another aircraft or a vessel head-on or approximately so, shall alter its heading to the right to keep well clear.

3.2.6.1.3 *Overtaking:* The aircraft or vessel, which is being overtaken, has the right of way, and the one overtaking shall alter its heading to keep well clear.

3.2.6.1.4 *Landing and taking off:* Aircraft landing on or taking off from the water shall keep well clear of all vessels and avoid impeding their navigation.

### 3.2.6.2 Lights to be displayed by aircraft on the water.

Between sunset and sunrise or such other period between sunset and sunrise as may be prescribed by the CAA, all aircraft on the water shall display lights as required by the International Regulations for Preventing Collisions at Sea (revised 1972) unless it is impractical for them to do so, in which case they shall display lights as closely similar as possible in characteristics and position to those required by the International Regulations.

*Note 1 – Specifications for lights to be shown by aeroplanes on the water are contained in the Appendices to Parts I and II of ICAO Annex 6 to the convention on International Civil Aviation.*

*Note 2 – The International Regulations for Preventing Collisions at Sea specify that the rules concerning lights shall be complied with from sunset to sunrise. Any lesser period between sunset and sunrise established in accordance with 3.2.6.3 cannot, therefore, be applied in areas where the International Regulations for Preventing Collisions at Sea apply, e.g. on the high seas.*

### **3.3 Flight plans**

#### **3.3.1 Submission of a flight plan**

3.3.1.1 Information relative to an intended flight or portion of a flight, to be provided to air traffic services units, shall be in the form of a flight plan.

3.3.1.2 A flight plan shall be submitted prior to operating

- a) any flight or portion thereof to be provided with air traffic control service;
- b) any IFR flight within advisory airspace;
- c) any flight within or into designated area, or along designated routes, to facilitate the provision of flight information, alerting and search and rescue services;
- d) For any flight within or into designated areas, or along designated routes, when so required by the appropriate ATS authority to facilitate coordination with appropriate military units or with air traffic services units in adjacent States in order to avoid the possible need for interception for identification;
- e) Any flight across international borders.

*Note – The term “flight plan” is used to mean variously, full information on all items comprised in the flight plan description, covering the whole route of a flight, or limited information required when the purpose is to obtain a clearance for a minor portion of a flight such as to cross an airway, to take off from, or to land at a controlled aerodrome.*

3.3.1.3 Unless otherwise prescribed by the appropriate ATS authority, a flight plan shall be submitted, before departure, to an air traffic services reporting office or, during flight, transmitted to the appropriate air traffic services unit or air-ground control radio station.

3.3.1.4 Unless otherwise prescribed by the appropriate ATS authority, a flight plan for a flight to be provided with air traffic control service or air traffic advisory service shall be submitted at least sixty minutes before departure, or, if submitted during flight, at a time which will ensure its receipt by the appropriate air traffic services unit at least ten minutes before the aircraft is estimated to reach:

- a) the intended point of entry into a control area or advisory area; or
- b) the point of crossing an airway or advisory route.

#### **3.3.2 Contents of a flight plan**

3.3.2.1 A flight plan shall comprise information regarding such of the following items as are considered relevant by CAA:

- Aircraft identification

- Flight rules and type of flight
- Number and type(s) of aircraft and wake turbulence category
- Equipment
- Departure aerodrome (see Note 1)
- Estimated off-block time (see Note 2)
- Cruising speed(s)
- Cruising level(s)
- Route to be followed
- Destination aerodrome and total estimated elapsed time
- Alternate aerodrome(s)
- Fuel endurance
- Total number of persons on board
- Emergency and survival equipment
- Other information.

*Note 1 – For flight plans submitted during flight, the information provided in respect of this item will be an indication of the location from which supplementary information concerning the flight may be obtained, if required.*

*Note 2 – For flight plans submitted during flight, the information to be provided in respect of this item will be the time over the first point of the route to which the flight plan relates.*

*Note 3 – The term “aerodrome” where used in the flight plan is intended to cover also sites other than aerodromes which may be used by certain types of aircraft, e.g. helicopters or balloons.*

### 3.3.3 Completion of a flight plan

3.3.3.1 Whatever the purpose for which it is submitted, a flight plan shall contain information, as applicable, on relevant items up to and including “Alternate aerodrome(s)” regarding the whole route or the portion thereof for which the flight plan is submitted.

3.3.3.2 It shall, in addition, contain information, as applicable, on all other items when so prescribed by the appropriate ATS authority or when otherwise deemed necessary by the person submitting the flight plan.

### 3.3.4 Changes to a flight plan

3.3.4.1 Subject to the provisions of 3.6.2.2, all changes to a flight plan submitted for an IFR flight, or a VFR flight operated as a controlled flight, shall be reported as soon as practicable to the appropriate air traffic services unit. For other VFR flights, significant changes to a flight plan shall be reported as soon as practicable to the appropriate air traffic services unit.

*Note – Information submitted prior to departure regarding fuel endurance or total number of persons carried on board, if incorrect at time of departure, constitutes a significant change to the flight plan and as such must be reported.*

### 3.3.5 Closing a flight plan

- 3.3.5.1 Unless otherwise prescribed by the appropriate ATS authority, a report of arrival shall be made in person, by radiotelephony or via data link at the earliest possible moment after landing, to the appropriate air traffic services unit at the arrival aerodrome, by any flight for which a flight plan has been submitted covering the entire flight or the remaining portion of a flight to the destination aerodrome.
- 3.3.5.2 When a flight plan has been submitted only in respect of a portion of a flight, other than the remaining portion of a flight to destination, it shall, when required, be closed by an appropriate report to the relevant air traffic services unit.
- 3.3.5.3 When no air traffic services unit exists at the arrival aerodrome, the arrival report, when required, shall be made as soon as practicable after landing and by the quickest means available to the nearest air traffic services unit.
- 3.3.5.4 When communication facilities at the arrival aerodrome are known to be inadequate and alternate arrangements for the handling of arrival reports on the ground are not available, the following action shall be taken.
- a) Immediately prior to landing the aircraft shall, if practicable, transmit to the appropriate air traffic services unit, a message comparable to an arrival report, where such a report is required.
  - b) Normally, this transmission shall be made to the aeronautical station serving the air traffic services unit in charge of the flight information region in which the aircraft is operated.
- 3.3.5.5 Arrival reports made by aircraft shall contain the following elements of information:
- a) aircraft identification;
  - b) departure aerodrome;
  - c) destination aerodrome (only in the case of a diversionary landing);
  - d) arrival aerodrome;
  - e) time of arrival.

*Note – Whenever an arrival report is required, failure to comply with these provisions may cause serious disruption in the air traffic services and incur great expense in carrying out unnecessary search and rescue operations.*

## 3.4 Signals

- 3.4.1 Upon observing or receiving any of the signals given in Appendix 1 of this MCAR, pilot-in-command of an aircraft shall take such action as may be required by the interpretation of the signal given in that Appendix and shall take such actions as may be required by such signals.
- 3.4.2 The signals of Appendix 1 shall, when used, have the meaning indicated therein. They shall be used only for the purpose indicated and no other signals likely to be confused with them shall be used.

- 3.4.3 A marshaller shall be responsible for providing standard marshalling signals to aircraft in a clear and precise manner using the signals shown in Appendix 1.
- 3.4.4 No person shall guide an aircraft unless trained, qualified and approved by the aerodrome operator to carry out the functions of a signalman.
- 3.4.5 The marshaller shall wear a distinctive fluorescent identification vest to allow the flight crew to identify that he or she is the person responsible for the marshalling operation.
- 3.4.6 Daylight-fluorescent wands, table-tennis bats or gloves shall be used for all signalling by all participating ground staff during daylight hours. Illuminated wands shall be used at night or in low visibility.

### **3.5 Time**

- 3.5.1 Coordinated Universal Time (UTC) shall be used and shall be expressed in hours and minutes and, when required, seconds of the 24-hour day beginning at midnight.
- 3.5.2 A time check shall be obtained prior to operating a controlled flight and at such other times during the flight as may be necessary.
- 3.5.3 Wherever time is utilized in the application of data link communications, it shall be accurate to within 1 second of UTC.

### **3.6 Air traffic control service**

#### **3.6.1 Air traffic control clearances**

- 3.6.1.1 An air traffic control clearance shall be obtained prior to operating a controlled flight, or a portion of a flight as a controlled flight. Such clearance shall be requested through the submission of a flight plan to an air traffic control unit.

*Note 1 – A flight plan may cover only part of a flight, as necessary, to describe that portion of the flight or those manoeuvres which are subject to air traffic control. A clearance may cover only part of a current flight plan, as indicated in a clearance limit or by reference to specific manoeuvres such as taxiing, landing or taking off.*

*Note 2 – If an air traffic control clearance is not satisfactory to a pilot-in-command of an aircraft, the pilot-in-command may request and, if practicable, will be issued an amended clearance.*

- 3.6.1.2 Whenever an aircraft has requested a clearance involving priority, a report explaining the necessity for such priority shall be submitted, if requested by the appropriate air traffic control unit.
- 3.6.1.3 The appropriate air traffic control units shall be so notified by the insertion in the flight plan of information concerning the revised route, where known, and the revised destination if prior to departure it is anticipated that depending on fuel endurance and subject to re-clearance in flight, a decision may be taken to proceed to a revised destination aerodrome.
- 3.6.1.4 An aircraft operated on a controlled aerodrome shall not taxi on the manoeuvring area without clearance from the aerodrome control tower and shall comply with any instructions given by that unit.

### 3.6.2 Adherence to flight plan

3.6.2.1 Except as provided for in 3.6.2.4, an aircraft shall adhere to the current flight plan, or the applicable portion of a current flight plan submitted for a controlled flight unless:

- a) a request for a change has been made and clearance obtained from the appropriate air traffic control unit, or
- b) an emergency situation arises which necessitates immediate action by the aircraft, in which event as soon as circumstances permit, after such emergency authority is exercised, the appropriate air traffic services unit shall be notified of the action taken and that this action has been taken under emergency authority.

3.6.2.1.1 Unless otherwise authorized by the appropriate ATS authority, or directed by the appropriate air traffic control unit, controlled flights shall, in so far as practicable:

- a) when on an established ATS route, operate along the defined centre line of that route; or
- b) when on any other route, operate directly between the navigation facilities and/or points defining that route.

3.6.2.1.2 Subject to the overriding requirement in 3.6.2.1.1, an aircraft operating along an ATS route segment defined by reference to very high frequency Omni-directional radio ranges shall change over for its primary navigation guidance from the facility behind the aircraft to that ahead of it at, or as close as operationally feasible to, the changeover point, where established.

3.6.2.1.3 Deviation from the requirements in 3.6.2.1.1 shall be notified to the appropriate air traffic services unit.

3.6.2.2 *Deviations from the current flight plan.* In the event that a controlled flight inadvertently deviates from its current flight plan, the following action shall be taken:

- a) Deviation from track: if the aircraft is off track, action shall be taken forthwith to adjust the heading of the aircraft to regain track as soon as practicable.
- b) Deviation from ATC assigned Mach number/indicated airspeed: the appropriate air traffic services unit shall be informed immediately.
- c) Deviation from Mach number/true airspeed: if the sustained Mach number/true airspeed at cruising level varies or is expected to vary by plus or minus Mach 0.2 or more, or plus or minus 19 Km/h (10 kt) true airspeed or more from the current flight plan, the appropriate air traffic services unit shall be so informed.
- d) Change in time estimate: except where ADS-C is activated and serviceable in airspace where ADS-C services are provided, if the time estimate for the next applicable reporting point, flight information region boundary or destination aerodrome, whichever comes first, is found to be in error in excess of 2 minutes from that previously notified to air traffic services, or such other period of time as is prescribed by the ATS provider or on the basis of air navigation regional agreements, a revised estimated time shall be notified as soon as possible to the appropriate air traffic services unit.

3.6.2.2.1 When an ADS agreement is in place, the air traffic services unit (ATSU) shall be informed automatically via data link whenever changes occur beyond the threshold values stipulated by the ADS event contract.

3.6.2.3 Change requests. Requests for flight plan changes shall include information as indicated hereunder:

a) Change of cruising level: aircraft identification; requested new cruising level and cruising speed at this level, revised time estimates (when applicable) at subsequent flight information region boundaries.

b) Change of Mach number/true airspeed: aircraft identification; requested Mach number/true airspeed.

c) Change of route::

1. *Destination unchanged:* aircraft identification; flight rules; description of new route of flight including related flight plan data beginning with the position from which requested change of route is to commence; revised time estimates; any other pertinent information.

2. *Destination changed:* aircraft identification; flight rules; description of revised route of flight to revised destination aerodrome including related flight plan data, beginning with the position from which requested change of route is to commence; revised time estimates; alternate aerodrome(s); any other pertinent information.

3.6.2.4 Weather deterioration below the VMC.

A VFR flight operated as a controlled flight, when it becomes evident that flight in VMC in accordance with its current flight plan will not be practicable shall:

a) request an amended clearance enabling the aircraft to continue in VMC to destination or to an alternative aerodrome, or to leave the airspace within which an ATC clearance is required; or

b) if no clearance in accordance with a) can be obtained, continue to operate in VMC and notify the appropriate ATC unit of the action being taken either to leave the airspace concerned or to land at the nearest suitable aerodrome; or

c) if operated within a control zone, request authorization to operate as a special VFR flight; or

d) request clearance to operate in accordance with the instrument flight rules.

3.6.3 Position reports

3.6.3.1 Unless exempted by the appropriate ATS authority or by the appropriate air traffic services unit under conditions specified by that authority, a controlled flight shall report to the appropriate air traffic services unit, as soon as possible:

a) the time and level of passing each designated compulsory reporting point, together with any other required information.

b) Position reports shall similarly be made in relation to additional points when requested by the appropriate air traffic services unit. In the absence of designated reporting points,

- c) position reports shall be made at intervals specified by the appropriate air traffic services unit.

3.6.3.1.1 Controlled flights providing position information to the appropriate air traffic services unit via data link communications shall only provide voice position reports when requested.

#### 3.6.4 Termination of control

A controlled flight shall, except when landing at a controlled aerodrome, advise the appropriate ATC unit as soon as it ceases to be subject to air traffic control service.

#### 3.6.5 Communications

3.6.5.1 An aircraft operated as a controlled flight shall maintain continuous air-ground voice communication watch on the appropriate communication channel of, and establish two-way communication as necessary with, the appropriate air traffic control unit, except as may be prescribed by the appropriate ATS authority in respect of aircraft forming part of aerodrome traffic at a controlled aerodrome.

*Note 1 – The requirement for an aircraft to maintain an air-ground voice communication watch remains in effect after CPDLC has been established.*

#### 3.6.5.2 Communication failure.

- a) If a communication failure precludes compliance with 3.6.5.1, the aircraft shall comply with the voice communication failure procedures in accordance with MCAR 171 and with such of the following procedures as are appropriate.
- b) The aircraft shall attempt to establish communications with the appropriate air traffic control unit using all other available means. In addition,
- c) The aircraft, when forming part of the aerodrome traffic at a controlled aerodrome, shall keep a watch for such instructions as may be issued by visual signals.

#### 3.6.5.2.1 An aircraft in visual meteorological conditions shall:

- a) continue to fly in visual meteorological conditions; land at the nearest suitable aerodrome; and report its arrival by the most expeditious means to the appropriate air traffic control unit;
- b) if considered advisable, complete an IFR flight in accordance with 3.6.5.2.2.

#### 3.6.5.2.2 the aircraft shall if in instrument meteorological conditions or when the pilot of an IFR flight considers it inadvisable to complete the flight in accordance with 3.6.5.2.1 a):

- a) maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 20 minutes following the aircraft's failure to report its position over a compulsory reporting point and thereafter adjust level and speed in accordance with the filed flight plan unless otherwise prescribed on the basis of regional air navigation agreement, in airspace where radar is not used in the provision of air traffic control;
- b) in airspace where radar is used in the provision of air traffic control, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 7 minutes following:



1. the time the last assigned level or minimum flight altitude is reached; or
2. the time the transponder is set to Code 7600; or
3. the aircraft's failure to report its position over a compulsory reporting point;

Whichever is later, and thereafter adjust level and speed in accordance with the filed flight plan;

- c) when being radar vectored or having been directed by ATC to proceed offset using RNAV without a specified limit, rejoin the current flight plan route no later than the next significant point, taking into consideration the applicable minimum flight altitude;
- d) proceed according to the current flight plan route to the appropriate designated navigation aid or fix serving the destination aerodrome and, when required to ensure compliance with e) below, hold over this aid or fix until commencement of descent;
- e) commence descent from the navigation aid or fix specified in d) at, or as close as possible to, the expected approach time last received and acknowledged; or, if no expected approach time has been received and acknowledged, at, or as close as possible to, the estimated time of arrival resulting from the current flight plan;
- f) complete a normal instrument approach procedure as specified for the designated navigation aid or fix; and
- g) land, if possible, within 30 minutes after the estimated time of arrival specified in e) or the last acknowledged expected approach time, whichever is later.

*Note 1 – The provision of air traffic control service to other flights operating in the airspace concerned will be based on the premise that an aircraft experiencing communication failure will comply with the rules in 3.6.5.2.2.*

### **3.7 Unlawful interference**

- 3.7.1 An aircraft which is being subjected to unlawful interference shall endeavour to notify the appropriate ATS unit of this fact, any significant circumstances associated therewith and any deviation from the current flight plan necessitated by the circumstances, in order to enable the Air Traffic Service unit to give priority to the aircraft and to minimize conflict with other aircraft.
- 3.7.2 The pilot-in-command of an aircraft subjected to unlawful interference, shall attempt to land as soon as practicable at the nearest suitable aerodrome or at a dedicated aerodrome assigned by appropriate authority unless considerations aboard the aircraft dictate otherwise.
- 3.7.3 A pilot-in-command shall, when and if possible, operate the secondary surveillance radar Mode A Code 7500 to indicate that the aircraft is being subjected to unlawful interference or secondary surveillance radar Mode A, Code 7700 to indicate that it is threatened by grave and imminent danger and requires immediate assistance.
- 3.7.4 The pilot-in-command of an aircraft subjected to unlawful interference shall when unable to notify an air traffic service unit shall attempt to continue flying on the assigned

track and at the assigned cruising level at least until able to notify an air traffic service unit or until within radar or ADS-B coverage.

- 3.7.5 The pilot-in-command of an aircraft subjected to unlawful interference, and which must depart from its assigned track or its assigned cruising level without being able to notify an air traffic service unit shall—
- a) attempt to broadcast warnings on the VHF channel in use or on the designated emergency frequency unless considerations aboard the aircraft dictate otherwise;
  - b) proceed at a level which differs from the cruising levels normally used for IFR flight by—
    - 1. 500 ft when flying in an area where vertical separation minimum of 1000 ft is applied
    - 2. 1000 ft in an area where vertical separation minimum of 2000 ft is applied

*Note 1 – Requirements for State authorities with respect to aircraft on the ground that are subject to unlawful interference are contained in ICAO Annex 17 to the convention on International Civil Aviation, Chapter 5, 5.2.4*

### 3.8 Interception

*Note – The word “interception” in this context does not include intercept and escort service provided, on request, to an aircraft in distress, in accordance with Volumes II and III of the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual (Doc 9731).*

- 3.8.1 Interception of civil aircraft shall be in compliance with these regulations and the Article 3(d) of the Convention on International Civil Aviation.
- 3.8.2 Subject to 3.10.1 the Authority shall undertake due regard for the safety of navigation of civil aircraft.
- 3.8.3 The pilot-in-command of a civil aircraft, when intercepted, shall comply with the requirements on Maldives AIP ENR 1.12 Interception of Civil Aircraft.
- 3.8.4 All civil aircraft of Maldives registry or operated by Maldivian operator(s) shall comply with the interception orders from other states.

### 3.9 VMC visibility and distance from cloud minima

VMC visibility and distance from cloud minima are contained in Table 3-1.

Altitude band	Airspace class	Flight visibility	Distance from cloud
At and above 3 050 m (10 000 ft) AMSL	A***B C D E F G	8 km	1500 horizontally 300 m (1 000 ft) vertically
Below 3 050 m (10 000 ft) AMSL and above 900 m (3 000 ft) AMSL, or above 300 m (1 000 ft) above terrain whichever is the higher	A***B C D E F G	5 km	1 500 m horizontally 300 m (1 000 ft) vertically

At and below 900 m (3 000 ft) AMSL, or 300 m (1 000 ft) above terrain, whichever is the higher	A***B C D E F G	5 km 5 km**	1 500 m horizontally 300 m (1 000 ft) vertically Clear of cloud and with the surface in sight
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Table 3-1 (see 4.1)

\* When the height of the transition altitude is lower than 3 050 m (10 000 ft) AMSL, FL 100 shall be used in lieu of 10 000 ft.

\*\* When so prescribed by the CAA:

- a) flight visibilities reduced to not less than 1 500 m may be permitted for flights operating:
  - 1. at speeds that, in the prevailing visibility, will give adequate opportunity to observe other traffic or any obstacles in time to avoid collision; or
  - 2. in circumstances in which the probability of encounters with other traffic would normally be low, e.g. in areas of low volume traffic and for aerial work at low levels.
- b) HELICOPTERS may be permitted to operate in less than 1 500 m flight visibility, if manoeuvred at a speed that will give adequate opportunity to observe other traffic or any obstacles in time to avoid collision.
- c) \*\*\*The VMC minima in Class A airspace are included for guidance to pilots and do not imply acceptance of VFR flights in Class A airspace.

## **CHAPTER 4 VISUAL FLIGHT RULES**

- 4.1 VFR flights shall be conducted so that the aircraft is flown in conditions of visibility and distance from clouds equal to or greater than those specified in Table 3-1, except when operating as a special VFR flight,
- 4.2 VFR flights shall not take off or land at an aerodrome within a control zone, or enter the aerodrome traffic zone or traffic pattern:
- a) when the ceiling is less than 450 m (1 500 ft); or
  - b) when the ground visibility is less than 5 km.
- Except when a clearance is obtained from an air traffic control unit.
- 4.3 The appropriate ATS authority shall prescribe the conditions that govern the operations of VFR flights between sunset and sunrise, or such other period between sunset and sunrise.
- 4.4 Unless authorized by the appropriate ATS authority VFR flights shall not be operated:
- a) above FL 200;
  - b) at transonic or supersonic speeds
- 4.5 Authorization for VFR flights to operate above FL 290 shall not be granted in areas where a vertical separation minimum of 300 m (1 000 ft) is applied above FL 290.
- 4.6 Except when necessary for take-off or landing, or except by permission from the CAA, a VFR flight shall not be flown:
- a) over the congested areas of cities, towns or settlements or over an open-air assembly of persons at a height less than 300 m (1 000 ft) above the highest obstacle within a radius of 600 m from the aircraft;
  - b) elsewhere than as specified in 4.6 a), at a height less than 150 m (500 ft) above the ground or water.
- 4.7 Except where otherwise indicated in air traffic control clearances or specified by the appropriate ATS authority, VFR flights in level cruising flight when operated above 900 m (3 000 ft) from the ground or water shall be conducted at a cruising level appropriate to the track as specified in the tables of cruising levels in Appendix 3 of this Regulation Manual.
- 4.8 VFR flights shall comply with the provisions of 3.6:
- a) when operated within Classes B, C and D airspace;
  - b) when forming part of aerodrome traffic at controlled aerodromes; or
  - c) when operated as special VFR flights.
- 4.9 A VFR flight operating within or into areas, or along routes, designated by appropriate ATS authority in accordance with 3.3.1.2 c) or d) shall maintain continuous air-ground voice communication watch on the appropriate communication channel of, and report its position as necessary to, the air traffic services unit providing flight information service.

- 4.10 An aircraft operated in accordance with the visual flight rules which wishes to change to compliance with the instrument flight rules shall:
- a) if a flight plan was submitted, communicate the necessary changes to be effected to its current flight plan; or
  - b) when so required by 3.3.1.2, submit a flight plan to the appropriate air traffic services unit and obtain a clearance prior to proceeding IFR when in controlled airspace.

## **CHAPTER 5 INSTRUMENT FLIGHT RULES**

### **5.1 Rules applicable to all IFR flights**

#### 5.1.1 Aircraft equipment

A pilot-in-command of an aircraft shall ensure that the aircraft is equipped with suitable instruments and with navigation equipment appropriate to the route to be flown.

#### 5.1.2 Minimum levels

Except when necessary for take-off or landing, or except when specifically authorized, an IFR flight shall be flown at a level which is not below the minimum flight altitude established by the State whose territory is overflown, or where no such minimum flight altitude has been established:

- a) over high terrain or in mountainous areas, at a level which is at least 600 m (2 000 ft) above the highest obstacle located within 8 km of the estimated position of the aircraft;
- b) elsewhere than as specified in a), at a level which is at least 300 m (1000 ft) above the highest obstacle located within 8 km of the estimated position of the aircraft.

*Note 1 – The estimated position of the aircraft will take account of the navigational accuracy which can be achieved on the relevant route segment, having regard to the navigational facilities available on the ground and in the aircraft.*

#### 5.1.3 Change from IFR flight to VFR flight

5.1.3.1 A pilot-in-command of an aircraft electing to change the conduct of its flight from compliance with the instrument flight rules to compliance with the visual flight rules shall, if a flight plan was submitted, notify the appropriate air traffic services unit specifically that the IFR flight is cancelled and communicate thereto the changes to be made to its current flight plan.

5.1.3.2 When a pilot of an aircraft operating under the instrument flight rules is flying in or encounters visual meteorological conditions, he/she shall not cancel its IFR flight unless it is anticipated, and intended, that the flight will be continued for a reasonable period of time in uninterrupted visual meteorological conditions.

### **5.2 Rules applicable to IFR flights within controlled airspace**

5.2.1 IFR flights shall comply with the provisions of 3.6 when operating in controlled airspace.

5.2.2 An IFR flight operating in cruising flight in controlled airspace shall be flown at a cruising level, or, if authorized to employ cruise climb techniques, between two levels or above a level, selected from

- a) the table of cruising levels in Appendix 3; or
- b) a modified table of cruising levels, when so prescribed in accordance with Appendix 3 for flight above FL 410;

- c) except that the correlation of levels to track prescribed therein shall not apply whenever otherwise indicated in air traffic control clearances or specified by the appropriate ATS authority in Aeronautical Information Publications.

### **5.3 Rules applicable to IFR flights outside controlled airspace**

#### **5.3.1 Cruising levels**

A pilot-in-command of an IFR flight operating in level cruising flight outside of controlled airspace shall fly the aircraft at a cruising level appropriate to its track as specified in:

- a) the table of cruising levels in Appendix 3, except when otherwise specified by CAA for flight at or below 900 m (3 000 ft) above mean sea level, or
- b) a modified table of cruising levels, when so prescribed in accordance with Appendix 3 for flight above FL 410.

*Note – This provision does not preclude the use of cruise climb techniques by aircraft in supersonic flight.*

#### **5.3.2 Communications**

A pilot-in-command of an IFR flight operating outside controlled airspace but within or into areas, or along routes, designated by the appropriate ATS authority in accordance with 3.3.1.2 c) or d) shall maintain an air-ground voice communication watch on the appropriate communication channel and establish two-way communication, as necessary, with the air traffic services unit providing flight information service.

#### **5.3.3 Position reports**

A pilot-in-command of an IFR flight operating outside controlled airspace shall report position as specified in 3.8.3 for controlled flights when required by the appropriate ATS authority to:

- submit a flight plan,
- maintain an air-ground voice communication watch on the appropriate communication channel and establish two-way communication, as necessary, with the air traffic services unit providing flight information service,

*Note – Aircraft electing to use the air traffic advisory service whilst operating IFR within specified advisory airspace are expected to comply with the provisions of 3.6, except that the flight plan and changes thereto are not subjected to clearances and that two-way communication will be maintained with the unit providing the air traffic advisory service.*

## APPENDIX 1 SIGNALS

(Note – See Chapter 3, 3.4 of this MCAR)

### 1 DISTRESS AND URGENCY SIGNALS

Note 1 – None of the provisions in this section shall prevent the use, by an aircraft in distress, of any means at its disposal to attract attention, make known its position and obtain help.

Note 2 – For full details of telecommunication transmission procedures for the distress and urgency signals, see ICAO Annex 10, Volume II, Chapter 5.

Note 3 – For details of the search and rescue visual signals, see ICAO Annex 12 to the convention International Civil Aviation.

#### 1.1 Distress Signals

The following signals used either together or separately, mean that grave and imminent danger threatens, and immediate assistance is requested:

- a) a signal made by radiotelegraphy or by any other signaling method consisting of the group SOS (. . . \_\_\_\_ . . . in the Morse Code);
- b) a radiotelephony distress signal consisting of the spoken word MAYDAY;
- c) a distress message sent via data link which transmits the intent of the word MAYDAY;
- d) rockets or shells throwing red lights, fired one at a time at short intervals;
- e) a parachute flare showing a red light.

Note – Article 41 of the ITU Radio Regulations (Nos. 3268, 3270 and 3271 refer) provides information on the alarm signals for actuating radiotelegraph and radiotelephone auto-alarm systems:

**3268** The radiotelegraph alarm signal consists of a series of twelve dashes sent in one minute, the duration of each dash being four seconds and the duration of the interval between consecutive dashes one second. It shall be transmitted by hand but its transmission shall be by means of an automatic instrument.

**3270** The radiotelephone alarm signal consists of two substantially sinusoidal audio frequency tones transmitted alternately. One tone shall have a frequency of 2 200 Hz and the other a frequency of 1 300 Hz, the duration of each tone being 250 milliseconds.

**3271** The radiotelephone alarm signal, when generated by automatic means, shall be sent continuously for a period of at least thirty seconds but not exceeding one minute; when generated by other means, the signal shall be sent as continuously as practicable over a period of approximately one minute.



## 1.2 Urgency Signals

1.2.1. The following signals, used either together or separately, mean that an aircraft wishes to give notice of difficulties which compel it to land without requiring immediate assistance:

- a) the repeated switching on and off of the landing lights; or
- b) the repeated switching on and off of the navigation lights in such manner as to be distinct from flashing navigation lights.

1.2.2. The following signals, used either together or separately, mean that an aircraft has a very urgent message to transmit concerning the safety of a ship, aircraft or other vehicle, or of some person on board or within sight:

- a) a signal made by radiotelegraphy or by any other signalling method consisting of the group XXX;
- b) a radiotelephony urgency signal consisting of the spoken words PAN, PAN;
- c) an urgency message sent via data link which transmits the intent of the words PAN, PAN.

## 2 SIGNALS FOR USE IN THE EVENT OF INTERCEPTION

### 2.1 Signals initiated by intercepting aircraft and responses by intercepted aircraft.

Series	INTERCEPTING – Aircraft Signals	Meaning	INTERCEPTED Aircraft Responds	Meaning
1	<p>DAY or NIGHT – 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.</p> <p>Note 1 – Meteorological conditions or terrain may require the intercepting aircraft to reverse the positions and direction of turn given above in Series 1.</p> <p>Note 2 – 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 pattern and to rock the aircraft each time it passes the intercepted aircraft.</p>	You have been intercepted, follow me.	<p>DAY or NIGHT – Rocking aircraft, flashing navigational lights at irregular intervals and following.</p> <p>Note – Additional action requires to be taken by intercepted aircraft is prescribed in Chapter 3, 3.8.</p>	Understood, will comply.
2	<p>DAY or NIGHT – An abrupt breakaway manoeuvre from the intercepted aircraft consisting of a climbing turn of 90 degrees or more without crossing the line of flight of the intercepted aircraft.</p>	You may proceed.	DAY or NIGHT – Rocking the aircraft.	Understood, will comply.

3	DAY or NIGHT - 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.	Land at this aerodrome.	DAY or NIGHT - 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, proceed to land.	Understood, will comply.
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**2.2 Signals initiated by intercepted aircraft and responses by intercepting aircraft**

Series	INTERCEPTING – Aircraft Signals	Meaning	INTERCEPTED Aircraft Responds	Meaning
4	DAY or NIGHT — 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 (1 000 ft) but not exceeding 600 m (2 000 ft) (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.	Aerodrome you have designated is inadequate.	DAY or NIGHT — 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.  If it is decided to release the intercepted aircraft, the intercepting aircraft uses the Series 2 signals prescribed for intercepting aircraft	Understood, follow me.  Understood, you may proceed.
5	DAY or NIGHT — Regular switching on and off of all available lights but in such a manner as to be distinct from flashing lights.	Cannot comply.	DAY or NIGHT — Use Series 2 signals prescribed for intercepting aircraft.	Understood
6	DAY or NIGHT — Irregular flashing of all available lights.	In distress.	DAY or NIGHT — Use Series 2 signals prescribed for intercepting aircraft.	Understood

**3 VISUAL SIGNALS USED TO WARN AN UNAUTHORIZED AIRCRAFT FLYING IN, OR ABOUT TO ENTER A RESTRICTED, PROHIBITED OR DANGER AREA**

By day and by night, a series of projectiles discharged from the ground at intervals of 10 seconds, each showing, on bursting, red and green lights or stars will indicate to an unauthorized aircraft that it is flying in or about to enter a restricted, prohibited or danger area, and that the aircraft is to take such remedial action as may be necessary.

## 4 SIGNALS FOR AERODROME TRAFFIC

### 4.1 Light and pyrotechnic signals

#### 4.1.1 Instructions

#### 4.1.2 Acknowledgement by an aircraft

Light	From Aerodrome Control to:	
	Aircraft in flight	Aircraft on the ground
Directed towards aircraft concerned (see Figure A1-1).	Steady green	Cleared to land
	Steady red	Give way to other aircraft and continue circling
	Series of green flashes	Return for landing*
	Series of red flashes	Aerodrome unsafe, do not land
	Series of white flashes	Land at this aerodrome and proceed to apron*
Red pyrotechnic	Notwithstanding any previous instructions, do not land for the time being	

\* Clearances to land and to taxi will be given in due course.

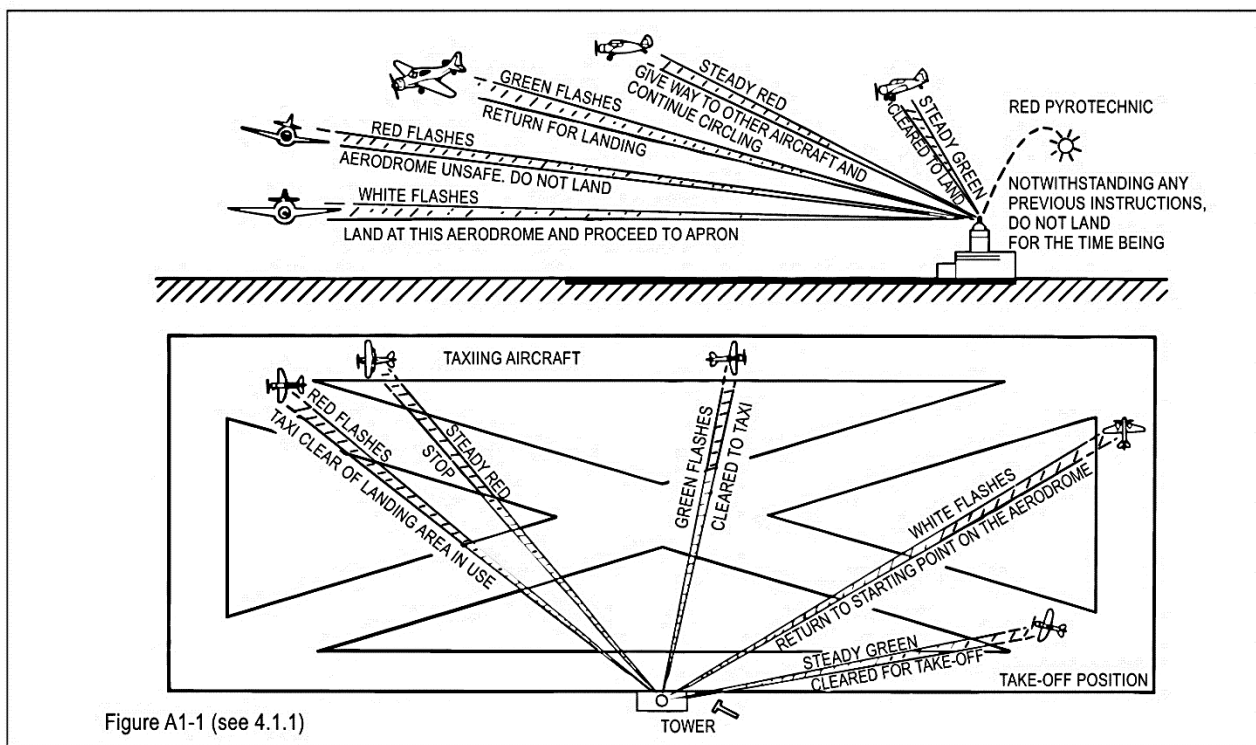


Figure A1-1 (see 4.1.1)

- a) When in flight:
1. during the hours of daylight:
    - by rocking the aircraft's wings;

Note – This signal shall not be expected on the base and final legs of the approach.

2. during the hours of darkness:
  - by flashing on and off twice the aircraft's landing lights or, if not so equipped, by switching on and off twice its navigation lights.

- b) When on the ground:
1. during the hours of daylight:

- by moving the aircraft's ailerons or rudder;
- 2. during the hours of darkness:
  - by flashing on and off twice the aircraft's landing lights or, if not so equipped, by switching on and off twice its navigation lights.

#### 4.2 Visual ground signals

Note – For details of visual ground aids, see ICAO Annex 14 to the convention on International Civil Aviation.

##### 4.2.1 Prohibition of landing

A horizontal red square panel with yellow diagonals (Figure A1-2) when displayed in a signal area indicates that landings are prohibited and that the prohibition is liable to be prolonged.



Figure A1-2

##### 4.2.2 Need for special precautions while approaching or landing

A horizontal red square panel with one yellow diagonal (Figure A1-3) when displayed in a signal area indicates that owing to the bad state of the manoeuvring area, or for any other reason, special precautions must be observed in approaching to land or in landing.

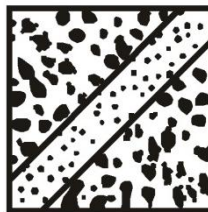


Figure A1-3

##### 4.2.3 Use of runways and taxiways

###### 4.2.3.1 A horizontal white dumb-bell (Figure A1-4) when displayed in a signal area indicates that aircraft are required to land, take off and taxi on runways and taxiways only.



Figure A1-4

###### 4.2.3.2 The same horizontal white dumb-bell as in 4.2.3.1 but with a black bar placed perpendicular to the shaft across each circular portion of the dumb-bell (Figure A1-5) when displayed in a signal area indicates that aircraft are required to land and take off

on runways only, but other manoeuvres need not be confined to runways and taxiways.

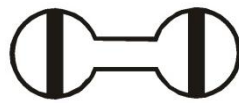


Figure A1-5

#### 4.2.4 Closed runways or taxiways

Crosses of a single contrasting colour, yellow or white (Figure A1-6), displayed horizontally on runways and taxiways or parts thereof indicate an area unfit for movement of aircraft.



Figure A1-6

#### 4.2.5 Directions for landing or take-off

##### 4.2.5.1 A horizontal white or orange landing T (Figure A1-7) indicates the direction to be used by aircraft for landing and take-off, which shall be in a direction parallel to the shaft of the T towards the cross arm.

Note – When used at night, the landing T is either illuminated or outlined in white lights.

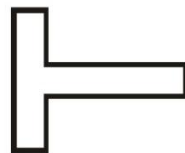


Figure A1-7

##### 4.2.5.2 A set of two digits (Figure A1-8) displayed vertically at or near the aerodrome control tower indicates to aircraft on the manoeuvring area the direction for take-off, expressed in units of 10 degrees to the nearest 10 degrees of the magnetic compass.



Figure A1-8

#### 4.2.6 Right-hand traffic

When displayed in a signal area, or horizontally at the end of the runway or strip in use, a right-hand arrow of conspicuous colour (Figure A1-9) indicates that turns are to be made to the right before landing and after take-off.

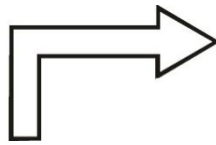


Figure A1-9

#### 4.2.7 Air traffic services reporting office

The letter C displayed vertically in black against a yellow background (Figure A1-10) indicates the location of the air traffic services reporting office.

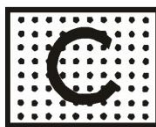


Figure A1-10

#### 4.2.8 Glider flights in operation

A double white cross displayed horizontally (Figure A1-11) in the signal area indicates that the aerodrome is being used by gliders and that glider flights are being performed.



Figure A1-11

## 5 MARSHALLING SIGNALS

### 5.1 From a signalman to an aircraft

Note 1 – These signals are designed for use by the signalman, with hands illuminated as necessary to facilitate observation by the pilot, and facing the aircraft in a position:

- a) for fixed-wing aircraft, on left side of aircraft, where best seen by the pilot; and
- b) for helicopters, where the signalman can best be seen by the pilot.

Note 2 – The meaning of the relevant signals remains the same if bats, illuminated wands or torchlights are held.

Note 3 – The aircraft engines are numbered, for the signalman facing the aircraft, from right to left (i.e. No. 1 engine being the port outer engine).


Note 4 – Signals marked with an asterisk (\*) are designed for use to hovering helicopters.

Note 5 – References to wands may also be read to refer to daylight-fluorescent table-tennis bats or gloves (daytime only).

Note 6 – References to the signalman may also be read to refer to marshaller.

5.1.1 Prior to using the following signals, the signalman shall ascertain that the area within which an aircraft is to be guided is clear of objects which the aircraft, in complying with 3.4.1, might otherwise strike.

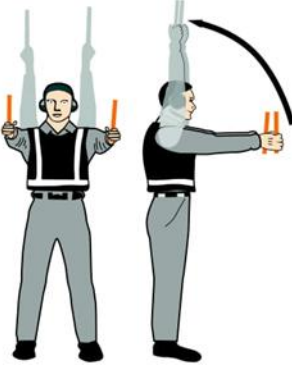
Note – The design of many aircraft is such that the path of the wing tips, engines and other extremities cannot always be monitored visually from the flight deck while the aircraft is being manoeuvred on the ground.



**1. Wingwalker/guide**


Raise right hand above head level with wand pointing up; move left-hand wand pointing down toward body.

*Note.— This signal provides an indication by a person positioned at the aircraft wing tip, to the pilot/ marshaller/ push-back operator, that the aircraft movement on/off a parking position would be unobstructed.*



**2. Identify gate**

Raise fully extended arms straight above head with wands pointing up.



**3. Proceed to next signalman or as directed by tower/ground control**

Point both arms upward; move and extend arms outward to sides of body and point with wands to direction of next signalman or taxi area.



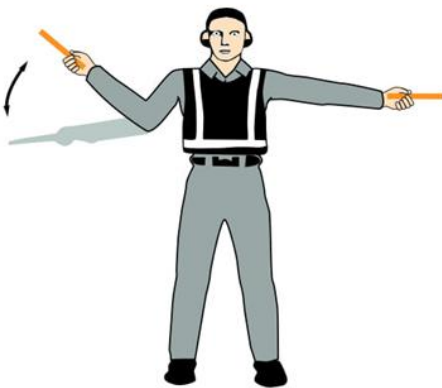
**4. Straight ahead**

Bend extended arms at elbows and move wands up and down from chest height to head.



**5 a). Turn left  
(from pilot's point of view)**

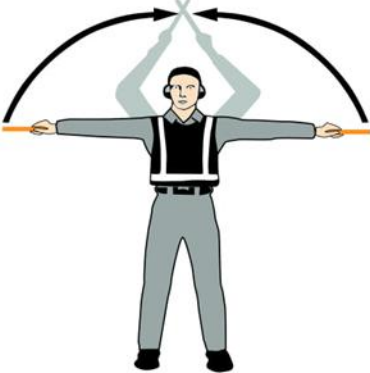
With right arm and wand extended at a 90-degree angle to body, make "come ahead" signal with left hand. The rate of signal motion indicates to pilot the rate of aircraft turn.



**5 b). Turn right  
(from pilot's point of view)**


With left arm and wand extended at a 90-degree angle to body, make "come ahead" signal with right hand. The rate of signal motion indicates to pilot the rate of aircraft turn.






**6 a). Normal stop**

Fully extend arms and wands at a 90-degree angle to sides and slowly move to above head until wands cross.



**6 b). Emergency stop**

Abruptly extend arms and wands to top of head, crossing wands.



**7 a). Set brakes**

Raise hand just above shoulder height with open palm. Ensuring eye contact with flight crew, close hand into a fist. **Do not** move until receipt of “thumbs up” acknowledgement from flight crew.



**7 b). Release brakes**

Raise hand just above shoulder height with hand closed in a fist. Ensuring eye contact with flight crew, open palm. **Do not** move until receipt of “thumbs up” acknowledgement from flight crew.



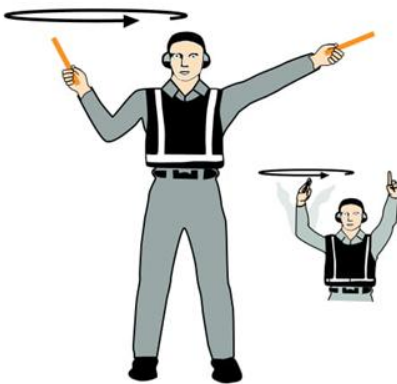
**8 a). Chocks inserted**

With arms and wands fully extended above head, move wands inward in a “jabbing” motion until wands touch. **Ensure** acknowledgement is received from flight crew.




**8 b). Chocks removed**

With arms and wands fully extended above head, move wands outward in a “jabbing” motion. **Do not** remove chocks until authorized by flight crew.




**9. Start engine(s)**

Raise right arm to head level with wand pointing up and start a circular motion with hand; at the same time, with left arm raised above head level, point to engine to be started.



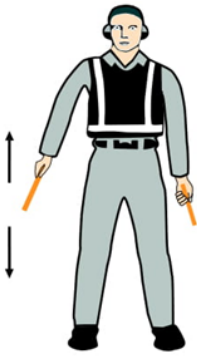
**10. Cut engines**

Extend arm with wand forward of body at shoulder level; move hand and wand to top of left shoulder and draw wand to top of right shoulder in a slicing motion across throat.




**11. Slow down**

Move extended arms downwards in a "patting" gesture, moving wands up and down from waist to knees.




**12. Slow down engine(s)  
on indicated side**

With arms down and wands toward ground, wave either *right* or *left* wand up and down indicating engine(s) on *left* or *right* side respectively should be slowed down.




**13. Move back**

With arms in front of body at waist height, rotate arms in a forward motion. To stop rearward movement, use signal 6 a) or 6 b).



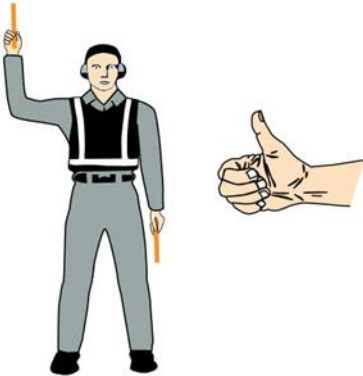
**14 a). Turns while backing  
(for tail to starboard)**

Point left arm with wand down and bring right arm from overhead vertical position to horizontal forward position, repeating right-arm movement.



**14 b). Turns while backing  
(for tail to port)**


Point right arm with wand down and bring left arm from overhead vertical position to horizontal forward position, repeating left-arm movement.



**15. Affirmative/all clear**

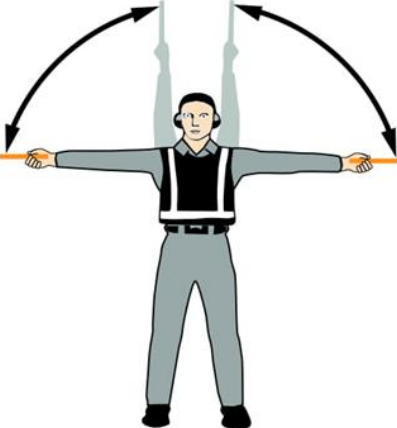
Raise right arm to head level with wand pointing up or display hand with “thumbs up”; left arm remains at side by knee.

*Note.— This signal is also used as a technical/ servicing communication signal.*



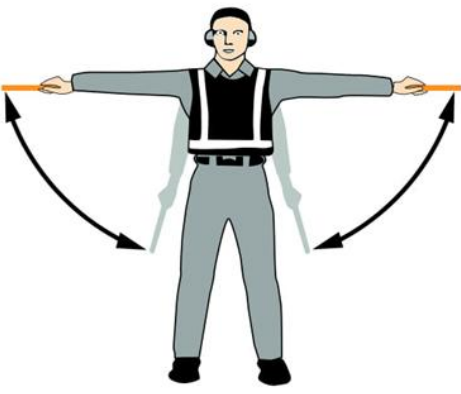
**\*16. Hover**

Fully extend arms and wands at a 90-degree angle to sides.




**\*17. Move upwards**

Fully extend arms and wands at a 90-degree angle to sides and, with palms turned up, move hands upwards. Speed of movement indicates rate of ascent.



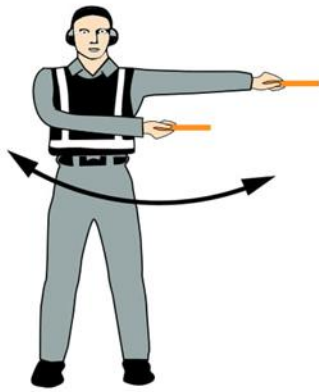
**\*18. Move downwards**

Fully extend arms and wands at a 90-degree angle to sides and, with palms turned down, move hands downwards. Speed of movement indicates rate of descent.



**\*19 a). Move horizontally left  
(from pilot's point of view)**

Extend arm horizontally at a 90-degree angle to right side of body. Move other arm in same direction in a sweeping motion.



**\*19 b). Move horizontally right  
(from pilot's point of view)**

Extend arm horizontally at a 90-degree angle to left side of body. Move other arm in same direction in a sweeping motion.



**\*20. Land**

Cross arms with wands downwards and in front of body.



**21. Hold position/stand by**

Fully extend arms and wands downwards at a 45-degree angle to sides. Hold position until aircraft is clear for next manoeuvre.



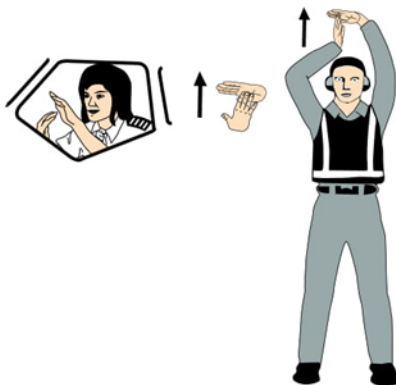
**22. Dispatch aircraft**

Perform a standard salute with right hand and/or wand to dispatch the aircraft. Maintain eye contact with flight crew until aircraft has begun to taxi.



**23. Do not touch controls  
(technical/servicing  
communication signal)**

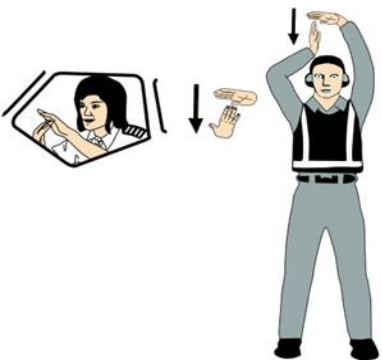
Extend right arm fully above head and close fist or hold wand in horizontal position; left arm remains at side by knee.



**24. Connect ground power  
(technical/servicing  
communication signal)**


Hold arms fully extended above head; open left hand horizontally and move finger tips of right hand into and touch open palm of left hand (forming a "T"). At night, illuminated wands can also be used to form the "T" above head.






**25. Disconnect power  
(technical/servicing  
communication signal)**

Hold arms fully extended above head with finger tips of right hand touching open horizontal palm of left hand (forming a “T”); then move right hand away from the left. **Do not** disconnect power until authorized by flight crew. At night, illuminated wands can also be used to form the “T” above head.




**26. Negative  
(technical/servicing  
communication signal)**

Hold right arm straight out at 90 degrees from shoulder and point wand down to ground or display hand with “thumbs down”; left hand remains at side by knee.



**27. Establish communication  
via interphone  
(technical/servicing  
communication signal)**

Extend both arms at 90 degrees from body and move hands to cup both ears.



**28. Open/close stairs  
(technical/servicing  
communication signal)**

With right arm at side and left arm raised above head at a 45-degree angle, move right arm in a sweeping motion towards top of left shoulder.

*Note.— This signal is intended mainly for aircraft with the set of integral stairs at the front.*

## 5.2 From the pilot of an aircraft to a signalman

*Note 1 – These signals are designed for use by a pilot in the cockpit with hands plainly visible to the signalman, and illuminated as necessary to facilitate observation by the signalman.*

*Note 2 – The aircraft engines are numbered in relation to the signalman facing the aircraft, from right to left (i.e. No. 1 engine being the port outer engine).*

### 5.2.1 Brakes

*Note – The moment the fist is clenched or the fingers are extended indicates, respectively, the moment of brake engagement or release.*

- a) Brakes engaged: raise arm and hand, with fingers extended, horizontally in front of face, then clench fist.
- b) Brakes released: raise arm, with fist clenched, horizontally in front of face, then extend fingers.

### 5.2.2 Chocks

- c) Insert chocks: arms extended, palms outwards, move hands inwards to cross in front of face.
- d) Remove chocks: hands crossed in front of face, palms outwards, move arms outwards.

### 5.2.3 Ready to start engine(s)

Raise the appropriate number of fingers on one hand indicating the number of the engine to be started.

## 5.3 Technical/servicing communication signals

5.3.1 Manual signals shall only be used when verbal communication is not possible with respect to technical/servicing communication signals.


5.3.2 Signalmen shall ensure that an acknowledgement is received from the flight crew with respect to technical/servicing communication signals.

*Note – The technical/servicing communication signals are included in Appendix 1 to standardize the use of hand signals used to communicate to flight crews during the aircraft movement process that relate to servicing or handling functions.*

## 6 STANDARD EMERGENCY HAND SIGNALS

The following hand signals are established as the minimum required for emergency communication between the aircraft rescue and firefighting (ARFF) incident commander/ARFF firefighters and the cockpit and/or cabin crews of the incident aircraft. ARFF emergency hand signals shall be given from the left front side of the aircraft for the flight crew.

*Note.— In order to communicate more effectively with the cabin crew, emergency hand signals may be given by ARFF firefighters from other positions.*




**1. Recommend evacuation**

Evacuation recommended based on ARFF and incident commander's assessment of external situation.

Arm extended from body and held horizontal with hand upraised at eye level. Execute beckoning arm motion angled backward. Non-beckoning arm held against body.

Night — same with wands.




**2. Recommended stop**

Recommend evacuation in progress be halted. Stop aircraft movement or other activity in progress.

Arms in front of head, crossed at wrists.

Night — same with wands.



**3. Emergency contained**

No outside evidence of dangerous conditions or “all-clear.”

Arms extended outward and down at a 45-degree angle. Arms moved inward below waistline simultaneously until wrists crossed, then extended outward to starting position (umpire's “safe” signal).

Night — same with wands.



#### 4. Fire

Move right-hand in a “fanning” motion from shoulder to knee, while at the same time pointing with left hand to area of fire.

Night — same with wands.

## **APPENDIX 2 INTERCEPTION OF CIVIL AIRCRAFT**

(Note – See Chapter 3, 3.8 of this MCAR)

### **1 ACTION BY INTERCEPTED AIRCRAFT**

- 1.1 An aircraft which is intercepted by another aircraft shall immediately:
- a) follow the instructions given by the intercepting aircraft, interpreting and responding to visual signals in accordance with the specifications in Appendix 1;
  - b) notify, if possible, the appropriate air traffic services unit;
  - c) attempt to establish radio-communication with the intercepting aircraft or with the appropriate intercept control unit, by making a general call on the emergency frequency 121.5 MHz, giving the identity of the intercepted aircraft and the nature of the flight; and if no contact has been established and if practicable, repeating this call on the emergency frequency 243 MHz;
  - d) if equipped with SSR transponder, select Mode A, Code 7700, unless otherwise instructed by the appropriate air traffic services unit.
  - e) if equipped with ADS-B or ADS-C, select the appropriate emergency functionality, if available, unless otherwise instructed by the appropriate air traffic services unit.
- 1.2 If any instructions received by radio from any sources conflict with those given by the intercepting aircraft by visual signals, the intercepted aircraft shall request immediate clarification while continuing to comply with the visual instructions given by the intercepting aircraft.
- 1.3 If any instructions received by radio from any sources conflict with those given by the intercepting aircraft by radio, the intercepted aircraft shall request immediate clarification while continuing to comply with the radio instructions given by the intercepting aircraft.

### **2 RADIO-COMMUNICATION DURING INTERCEPTION**

If radio contact is established during interception but communication in a common language is not possible, attempts shall be made to convey instructions, acknowledgement of instructions and essential information by using the phrases and pronunciations in Table A2-1 and transmitting each phrase twice:

**Table A2-1**

Phrases for use by INTERCEPTING aircraft			Phrases for use by INTERCEPTED aircraft		
Phrase	Pronunciation <sup>1</sup>	Meaning	Phrase	Pronunciation <sup>1</sup>	Meaning
CALL SIGN	KOL SA-IN	What is your call sign?	CALL SIGN (call sign) <sup>2</sup>	KOL SA-IN (call sign)	My call sign is (call sign)
FOLLOW	FOL-LO	Follow me	WILCO	VILL-KO	Understood Will comply
DESCEND	DEE-SEND	Descend for landing	CAN NOT	KANN NOTT	Unable to comply
YOU LAND	YOU LAAND	Land at this aerodrome	REPEAT	REE-PEET	Repeat your instruction
PROCEED	PRO-SEED	You may proceed	AM LOST	AM LOSST	Position unknown
			MAYDAY	MAYDAY	I am in distress
			HIJACK <sup>3</sup>	HI-JACK	I have been hijacked
			LAND (place name)	LAAND (place name)	I request to land at (place name)
			DESCEND	DEE-SEND	I require descent

1. In the second column, syllables to be emphasized are underlined.
2. The call sign required to be given is that used in radiotelephony communications with air traffic services units and corresponding to the aircraft identification in the flight plan.
3. Circumstances may not always permit, nor make desirable, the use of the phrase "HIJACK".

## APPENDIX 3 TABLE OF CRUISING LEVELS

The cruising levels to be observed when so required by this MCAR are as follows:

### RVSM — FEET

- a) *Within Male’ FIR in accordance with conditions specified in the regional air navigation agreement, a vertical separation minimum (VSM) of 300 m (1 000 ft) is applied between FL 290 and FL 410 inclusive:\**

TRACK**											
From 000 degrees to 179 degrees***						From 180 degrees to 359 degrees***					
IFR Flights Level			VFR Flights Level			IFR Flights Level			VFR Flights Level		
FL	Feet	Metres	FL	Feet	Metre	FL	Feet	Metre	FL	Feet	Metre
					s			s			s
010	1 000	300	-	-	-	020	2 000	600	-	-	-
030	3 000	900	035	3 500	1 050	040	4 000	1 200	045	4 500	1 350
050	5 000	1 500	055	5 500	1 700	060	6 000	1 850	065	6 500	2 000
070	7 000	2 150	075	7 500	2 300	080	8 000	2 450	085	8 500	2 600
090	9 000	2 750	095	9 500	2 900	100	10 000	3 050	105	10 500	3 200
110	11 000	3 350	115	11 500	3 500	120	12 000	3 650	125	12 500	3 800
130	13 000	3 950	135	13 500	4 100	140	14 000	4 250	145	14 500	4 400
150	15 000	4 550	155	15 500	4 700	160	16 000	4 900	165	16 500	5 050
170	17 000	5 200	175	17 500	5 350	180	18 000	5 500	185	18 500	5 650
190	19 000	5 800	195	19 500	5 950	200	20 000	6 100	205	20 500	6 250
210	21 000	6 400	215	21 500	6 550	220	22 000	6 700	225	22 500	6 850
230	23 000	7 000	235	23 500	7 150	240	24 000	7 300	245	24 500	7 450
250	25 000	7 600	255	25 500	7 750	260	26 000	7 900	265	26 500	8 100
270	27 000	8 250	275	27 500	8 400	280	28 000	8 550	285	28 500	8 700
290	29 000	8 850				300	30 000	9 150			
310	31 000	9 450				320	32 000	9 750			
330	33 000	10 050				340	34 000	10 350			
350	35 000	10 650				360	36 000	10 950			
370	37 000	11 300				380	38 000	11 600			
390	39 000	11 900				400	40 000	12 200			
410	41 000	12 500				430	43 000	13 100			
450	45 000	13 700				470	47 000	14 350			
490	49 000	14 950				510	51 000	15 550			
etc.	etc.	etc.				etc.	etc.	etc.			

\* Except when, on the basis of regional air navigation agreements, a modified table of cruising levels based on a nominal vertical separation minimum of 1000 ft (300 m) is prescribed for use, under specified conditions, by aircraft operating above FL 410 within designated portions of the airspace.

\*\* Magnetic track, or in polar areas at latitudes higher than 70 degrees and within such extensions to those areas as may be prescribed by the appropriate ATS authorities, grid tracks as determined by a network of lines parallel to the Greenwich Meridian superimposed on a polar stereographic chart in which the direction towards the North Pole is employed as the Grid North.

\*\*\* Except where, on the basis of regional air navigation agreements, from 090 to 269 degrees and from 270 to 089 degrees is prescribed to accommodate predominant traffic directions and appropriate transition procedures to be associated therewith are specified.

Note.— Guidance material relating to vertical separation is contained in the Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (Doc 9574).

### RVSM — METRES

a) in areas where metres are used for altitude and where, in accordance with regional air navigation agreements, a vertical separation minimum of 300 m is applied between 8 900 m and 12 500 m inclusive:\*

TRACK**											
From 000 degrees to 179 degrees***						From 180 degrees to 359 degrees***					
IFR Flights Level			VFR Flights Level			IFR Flights Level			VFR Flights Level		
FL	Feet	Metre	FL	Feet	Metre	FL	Feet	Metre	FL	Feet	Metres
		s			s			s			
010	1 000	1 000	-	-	-	0060	600	2 000	-	-	-
030	3 000	3 000	0105	1 050	3 500	0120	1 200	3 900	0135	4 500	1 350
050	5 000	4 900	0165	1 650	5 400	0180	1 800	5 900	0195	6 500	2 000
070	7 000	6 900	0225	2 250	7 400	0240	2 400	7 900	0255	8 500	2 600
090	9 000	8 900	0285	2 850	9 400	0300	3 000	9 800	0315	10 500	3 200
110	11 000	10 800	0345	3 450	11 300	0360	3 600	11 800	0375	12 500	3 800
130	13 000	12 800	0405	4 050	13 300	0420	4 200	13 800	0435	14 500	4 400
150	15 000	14 800	0465	4 650	15 500	0480	4 800	15 700	0495	16 500	5 050
170	17 000	16 700	0525	5 250	17 200	0540	5 400	17 700	0555	18 500	5 650
190	19 000	18 700	0585	5 850	19 200	0600	6 000	19 700	0615	20 500	6 250
210	21 000	20 700	0645	6 450	21 200	0660	6 600	21 700	0675	22 500	6 850
230	23 000	22 600	0705	7 050	23 100	0720	7 200	23 600	0735	24 500	7 450
250	25 000	24 600	0765	7 650	25 100	0780	7 800	25 600	0795	26 500	8 100
270	27 000	26 600	0825	8 250	27 100	0840	8 400	27 600	0855	28 500	8 700
290	29 000	29 100				0920	9 200	30 100			
330	33 000	31 100				0980	9 800	32 100			
370	37 000	33 100				1040	10 400	34 100			
410	41 000	35 100				1100	11 000	36 100			
450	45 000	37 100				1160	11 600	38 100			
490	49 000	39 100				1220	12 200	40 100			
010	1 000	41 100				1310	13 100	43 000			
030	3 000	44 900				1430	14 300	46 900			
050	5 000	48 900				1550	15 500	50 900			
		etc.				etc.	etc.	etc.			

\* Except when, on the basis of regional air navigation agreements, a modified table of cruising levels based on a nominal vertical separation minimum of 1000 ft (300 m) is prescribed for use, under specified conditions, by aircraft operating above FL 410 within designated portions of the airspace.

\*\* Magnetic track, or in polar areas at latitudes higher than 70 degrees and within such extensions to those areas as may be prescribed by the appropriate ATS authorities, grid tracks as determined by a network of lines parallel to the



Greenwich Meridian superimposed on a polar stereographic chart in which the direction towards the North Pole is employed as the Grid North.

\*\*\* Except where, on the basis of regional air navigation agreements, from 090 to 269 degrees and from 270 to 089 degrees is prescribed to accommodate predominant traffic directions and appropriate transition procedures to be associated therewith are specified.

*Note.— Guidance material relating to vertical separation is contained in the Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (Doc 9574).*

**Non-RVSM — FEET**

a) *in other areas where feet are the primary unit of measurement for altitude:*

TRACK**											
From 000 degrees to 179 degrees***						From 180 degrees to 359 degrees***					
IFR Flights Level			VFR Flights Level			IFR Flights Level			VFR Flights Level		
Standard Metric	Metres	Feet	Standard Metric	Metres	Feet	Standard Metric	Metres	Feet	Standard Metric	Metres	Feet
010	1 000	300	–	–	–	020	2 000	600	–	–	–
030	3 000	900	035	3 500	1 050	040	4 000	1 200	045	4 500	1 350
050	5 000	1 500	055	5 500	1 700	060	6 000	1 850	065	6 500	2 000
070	7 000	2 150	075	7 500	2 300	080	8 000	2 450	085	8 500	2 600
090	9 000	2 750	095	9 500	2 900	100	10 000	3 050	105	10 500	3 200
110	11 000	3 350	115	11 500	3 500	120	12 000	3 650	125	12 500	3 800
130	13 000	3 950	135	13 500	4 100	140	14 000	4 250	145	14 500	4 400
150	15 000	4 550	155	15 500	4 700	160	16 000	4 900	165	16 500	5 050
170	17 000	5 200	175	17 500	5 350	180	18 000	5 500	185	18 500	5 650
190	19 000	5 800	195	19 500	5 950	200	20 000	6 100	205	20 500	6 250
210	21 000	6 400	215	21 500	6 550	220	22 000	6 700	225	22 500	6 850
230	23 000	7 000	235	23 500	7 150	240	24 000	7 300	245	24 500	7 450
250	25 000	7 600	255	25 500	7 750	260	26 000	7 900	265	26 500	8 100
270	27 000	8 250	275	27 500	8 400	280	28 000	8 550	285	28 500	8 700
290	29 000	8 850	300	30 000	9 150	310	31 000	9 450	320	32 000	9 750
330	33 000	10 050	340	34 000	10 350	350	35 000	10 650	360	36 000	10 950
					11 300						
370	37 000	11 300	380	38 000	11 600	390	39 000	11 900	400	40 000	12 200
					12 500						
410	41 000	12 500	420	42 000	12 800	430	43 000	13 100	440	44 000	13 400
					13 700						
450	45 000	13 700	460	46 000	14 000	470	47 000	14 350	480	48 000	14 650
					14 950						
490	49 000	14 950	500	50 000	15 250	510	51 000	15 550	520	52 000	15 850
etc.	etc.	etc.				etc.	etc.	etc.			

\*\* Magnetic track, or in polar areas at latitudes higher than 70 degrees and within such extensions to those areas as may be prescribed by the appropriate ATS authorities, grid tracks as determined by a network of lines parallel to the Greenwich Meridian superimposed on a polar stereographic chart in which the direction towards the North Pole is employed as the Grid North.

\*\*\* Except where, on the basis of regional air navigation agreements, from 090 to 269 degrees and from 270 to 089 degrees is prescribed to accommodate predominant traffic directions and appropriate transition procedures to be associated therewith are specified.

*Note.— Guidance material relating to vertical separation is contained in the Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (Doc 9574).*

**Non-RVSM — METRES**

b) in other areas where metres are the primary unit of measurement for altitude:

TRACK**											
From 000 degrees to 179 degrees***						From 180 degrees to 359 degrees***					
IFR Flights Level			VFR Flights Level			IFR Flights Level			VFR Flights Level		
FL	Feet	Metre	FL	Feet	Metre	FL	Feet	Metre	FL	Feet	Metres
		s			s			s			
0030	300	1 000	-	-	-	0060	600	2 000	-	-	-
0090	900	3 000	0105	1 050	3 500	0120	1 200	3 900	0135	1 350	4 400
0150	1 500	4 900	0165	1 650	5 400	0180	1 800	5 900	0195	1 950	6 400
0210	2 100	6 900	0225	2 250	7 400	0240	2 400	7 900	0255	2 550	8 400
0270	2 700	8 900	0285	2 850	9 400	0300	3 000	9 800	0315	3 150	10 300
0330	3 300	10 800	0345	3 450	11 300	0360	3 600	11 800	0375	3 750	12 300
0390	3 900	12 800	0405	4 050	13 300	0420	4 200	13 800	0435	4 350	14 300
0450	4 500	14 800	0465	4 650	15 300	0480	4 800	15 700	0495	4 950	16 200
0510	5 100	16 700	0525	5 250	17 200	0540	5 400	17 700	0555	5 550	18 200
0570	5 700	18 700	0585	5 850	19 200	0600	6 000	19 700	0615	6 150	20 200
0630	6 300	20 700	0645	6 450	21 200	0660	6 600	21 700	0675	6 750	22 100
0690	6 900	22 600	0705	7 050	23 100	0720	7 200	23 600	0735	7 350	24 100
0750	7 500	24 600	0765	7 650	25 100	0780	7 800	25 600	0795	7 950	26 100
0810	8 100	26 600	0825	8 250	27 100	0840	8 400	27 600	0855	8 550	28 100
0890	8 900	29 100	0920	9 200	30 100	0950	9 500	31 100	0980	9 800	32 100
1010	10 100	33 100	1040	10 400	34 100	1070	10 700	35 100	1100	11 000	36 100
1130	11 300	37 100	1160	11 600	38 100	1190	11 900	39 100	1220	12 200	40 100
1250	12 500	41 100	1280	12 800	42 100	1310	13 100	43 000	1370	13 400	44 000
1370	13 700	44 900	1400	14 000	46 100	1430	14 300	46 900	1460	14 600	47 900
1490	14 900	48 900	1520	15 200	49 900	1550	15 500	50 900	1580	15 800	51 900
etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.

\*\* Magnetic track, or in polar areas at latitudes higher than 70 degrees and within such extensions to those areas as may be prescribed by the appropriate ATS authorities, grid tracks as determined by a network of lines parallel to the Greenwich Meridian superimposed on a polar stereographic chart in which the direction towards the North Pole is employed as the Grid North.

\*\*\* Except where, on the basis of regional air navigation agreements, from 090 to 269 degrees and from 270 to 089 degrees is prescribed to accommodate predominant traffic directions and appropriate transition procedures to be associated therewith are specified.

*Note.— Guidance material relating to vertical separation is contained in the Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (Doc 9574).*

## **APPENDIX 4 REMOTELY PILOTED AIRCRAFT SYSTEMS**

*Note.— See Chapter 3, 3.1.9 of this MCAR*

*Note – The Manual on Remotely Piloted Aircraft Systems (RPAS) (DOC 10019), contains explanatory information related to remotely piloted aircraft systems.*

### **1 General operating rules**

- 1.1 Unless otherwise stated in any other MCAR, a remotely piloted aircraft system (RPAS) shall not be operated without appropriate authorization from the CAA.
- 1.2 An RPA shall not be operated across the territory of another State without special authorization issued by each State in which the flight is to operate. This authorization may be in the form of agreements between the States involved.
- 1.3 An RPA shall not be operated over the high seas without prior coordination with the appropriate ATS authority.
- 1.4 The authorization and coordination referred to in 1.2 and 1.3 shall be obtained prior to take-off if there is reasonable expectation, when planning the operation, that the aircraft may enter the airspace concerned.
- 1.5 An RPAS shall be operated in accordance with conditions specified by the State of Registry, the State of the Operator, if different, and the State(s) in which the flight is to operate.
- 1.6 Flight plans shall be submitted in accordance with Chapter 3 of this MCAR or as otherwise mandated by the State(s) in which the flight is to operate.
- 1.7 RPAS shall meet the performance and equipment carriage requirements for the specific airspace in which the flight is to operate.

### **2 Certificates and licensing**

*Note 1.—ICAO Assembly Resolution A41-10 Appendix C resolves that pending the coming into force of international Standards respecting particular categories, classes or types of aircraft, certificates issued or rendered valid, under national regulations, by the Contracting State in which the aircraft is registered shall be recognized by other Contracting States for the purposes of flight over their territories, including landings and take-offs.*

*Note 2.— Notwithstanding ICAO Assembly Resolution A41-10, Article 8 of the Chicago Convention assures each Contracting State of the absolute sovereignty over the authorization for RPA operations over its territory.*

- 2.1 Until 25 November 2026, an RPAS shall be approved, taking into account the interdependencies of the components, in accordance with national regulations and in a manner that is consistent with the provisions of related MCARs. In addition, unless otherwise stated in any other MCAR:

- a) an RPA shall have a certificate of airworthiness issued in accordance with national regulations and in a manner that is consistent with the provisions of Annex 8 to the Convention on International Civil Aviation; and
- b) the associated RPAS components specified in the type design shall be certificated and maintained in accordance with national regulations and in a manner that is consistent with the provisions of related Annexes to the Convention on International Civil Aviation.

As of 26 November 2026, An RPAS shall be approved, taking into account the interdependencies of the components, in accordance with national regulations and in a manner that is consistent with the provisions of related Annexes to the Convention on International Civil Aviation. In addition:

- a) an RPA shall have a certificate of airworthiness issued in accordance with the provisions of Annex 8 to the convention on International Civil Aviation; and
- b) the associated RPAS components specified in the type design shall be certificated and maintained in accordance with the provisions of related Annexes to the Convention on International Civil Aviation

2.2 Unless otherwise stated in any other MCAR, an operator shall have an RPAS operator certificate issued in accordance with national regulations and in a manner that is consistent with the provisions of Annex 6, Part IV to the Convention on International Civil Aviation .

2.3 Unless otherwise stated in any other MCAR, remote pilots shall be licensed or have their licences rendered valid, in accordance with the provisions of Annex 1 to the Convention on International Civil Aviation.

### **3 Request for authorization**

3.1 The request for authorization referred to in 1.2 above shall be made to the appropriate authorities of the State(s) in which the RPA will operate not less than seven days before the date of the intended flight unless otherwise specified by the State.

3.2 Unless otherwise stated in any other MCAR, the request for authorization shall include the following:

- a) name and contact information of the operator;
- b) RPA characteristics (type of aircraft, maximum certificated take-off mass, number of engines, wing span);
- c) copy of certificate of registration;
- d) aircraft identification to be used in radiotelephony, if applicable;
- e) copy of the certificate of airworthiness;
- f) copy of the RPAS operator certificate;
- g) copy of the remote pilot(s) licence;
- h) copy of the aircraft radio station licence, if applicable;

- i) description of the intended operation (to include type of operation or purpose), flight rules, visual line-of-sight (VLOS) operation if applicable, date of intended flight(s), point of departure, destination, cruising speed(s), cruising level(s), route to be followed, duration/frequency of flight;
- j) take-off and landing requirements;
- k) RPA performance characteristics, including:
  - 1. operating speeds;
  - 2. typical and maximum climb rates;
  - 3. typical and maximum descent rates;
  - 4. typical and maximum turn rates;
  - 5. other relevant performance data (e.g. limitations regarding wind, icing, precipitation); and
  - 6. maximum aircraft endurance;
- l) communications, navigation and surveillance capabilities:
  - 1. aeronautical safety communications frequencies and equipment, including:
    - i. ATC communications, including any alternate means of communication;
    - ii. command and control links (C2) including performance parameters and designated operational coverage area;
    - iii. communications between remote pilot and RPA observer, if applicable;
  - 2. navigation equipment; and
  - 3. surveillance equipment (e.g. SSR transponder, ADS-B out);
- m) detect and avoid capabilities;
- n) emergency procedures, including:
  - 1. communications failure with ATC;
  - 2. C2 failure; and
  - 3. remote pilot/RPA observer communications failure, if applicable;
- o) number and location of remote pilot stations as well as handover procedures between remote pilot stations, if applicable;
- p) document attesting noise certification that is consistent with the provisions of Annex 16, Volume 1 to the convention on International Civil Aviation, if applicable;
- q) confirmation of compliance with national security standards in a manner that is consistent with the provisions of Annex 17 to the convention on International Civil Aviation, to include security measures relevant to the RPAS operation, as appropriate;
- r) payload information/description; and
- s) proof of adequate insurance/liability coverage.

- 3.3 When certificates or other documents identified in 3.2 above are issued in a language other than English, an English translation shall be included.
- 3.4 After authorization has been obtained from the appropriate State(s), air traffic services notification and coordination shall be completed in accordance with the requirements of the State(s).
- Note. — A request for authorization does not satisfy the requirement to file a flight plan with the air traffic services units.*
- 3.5 Changes to the authorization shall be submitted for consideration to the appropriate State(s). If the changes are approved, all affected authorities shall be notified by the operator.
- 3.6 In the event of a flight cancellation, the operator or remote pilot shall notify all appropriate authorities as soon as possible.

## **APPENDIX 5 UNMANNED FREE BALLOONS**

(Note – See Chapter 3, 3.1.10 of this MCAR)

### **1 CLASSIFICATION OF UNMANNED FREE BALLOONS**

Unmanned free balloons shall be classified as:

- a) light: an unmanned free balloon which carries a payload of one or more packages with a combined mass of less than 4 kg, unless qualifying as a heavy balloon in accordance with c) 2), 3) or 4) below; or
- b) medium: an unmanned free balloon which carries a payload of two or more packages with a combined mass of 4 kg or more, but less than 6 kg, unless qualifying as a heavy balloon in accordance with c) 2), 3) or 4) below; or
- c) heavy: an unmanned free balloon which carries a payload which:
  1. has a combined mass of 6 kg or more; or
  2. includes a package of 3 kg or more; or
  3. includes a package of 2 kg or more with an area density of more than 13 g per square centimeter; or
  4. uses a rope or other device for suspension of the payload that requires an impact force of 230 N or more to separate the suspended payload from the balloon.

*Note 1 – The area density referred to in c) 3) is determined by dividing the total mass in grams of the payload package by the area in square centimeters of its smallest surface.*

*Note 2 – See Figure A5-1*

### **2 GENERAL OPERATING RULES**

- 2.1 An unmanned free balloon shall not be operated without appropriate authorization from the MCAA from where the launch is made.
- 2.2 An unmanned free balloon, other than a light balloon used exclusively for meteorological purposes and operated in the manner prescribed by MCAA, shall not be operated across the territory of another State without appropriate authorization from the other State concerned.
- 2.3 The authorization referred to in 2.2 shall be obtained prior to the launching of the balloon if there is reasonable expectation, when planning the operation, that the balloon may drift into airspace over the territory of another State. Such authorization may be obtained for a series of balloon flights or for a particular type of recurring flight, e.g. atmospheric research balloon flights.
- 2.4 An unmanned free balloon shall be operated in accordance with conditions specified by MCAA and the State(s) expected to be overflown.



CHARACTERISTICS		PAYLOAD MASS (kilogrammes)					
		1	2	3	4	5	6 or more
ROPE or OTHER SUSPENSION  230 Newtons or MORE		<b>HEAVY</b>					
INDIVIDUAL PAYLOAD PACKAGE  <div style="border: 1px dashed black; padding: 5px; width: fit-content;">                         AREA DENSITY CALCULATION  <math>\frac{\text{MASS (g)}}{\text{Area of smallest surface (cm}^2\text{)}}</math> </div>	AREA DENSITY more than 13 g/cm <sup>2</sup>	<b>LIGHT</b>		<b>MEDIUM</b>			
	AREA DENSITY less than 13 g/cm <sup>2</sup>						
COMBINED MASS (if Suspension OR Area density OR Mass of individual package are not factors)		<b>LIGHT</b>		<b>MEDIUM</b>			

Figure A5-1. Classification of unmanned free balloons

- 2.5 An unmanned free balloon shall not be operated in such a manner that impact of the balloon, or any part thereof, including its payload, with the surface of the earth, creates a hazard to persons or property not associated with the operation.
- 2.6 A heavy unmanned free balloon shall not be operated over the high seas without prior coordination with the appropriate ATS authority.

### **3 OPERATING LIMITATIONS AND EQUIPMENT REQUIREMENTS**

- 3.1 A heavy unmanned free balloon shall not be operated without authorization from the appropriate ATS authority at or through any level below 18 000 m (60 000 ft) pressure-altitude at which:
- a) there are clouds or obscuring phenomena of more than four oktas coverage; or
  - b) the horizontal visibility is less than 8 km.
- 3.2 A heavy or medium unmanned free balloon shall not be released in a manner that will cause it to fly lower than 300 m (1 000 ft) over the congested areas of cities, towns or settlements or an open-air assembly of persons not associated with the operation.
- 3.3 A heavy unmanned free balloon shall not be operated unless:
- a) it is equipped with at least two payload flight termination devices or systems, whether automatic or operated by telecommand, that operate independently of each other;
  - b) for polyethylene zero-pressure balloons, at least two methods, systems, devices, or combinations thereof, that function independently of each other are employed for terminating the flight of the balloon envelope;

*Note.— Super-pressure balloons do not require these devices as they quickly rise after payload discharge and burst without the need for a device or system designed to puncture the balloon envelope. In this context a super-pressure balloon is a simple non-extensible envelope capable of withstanding a differential of pressure, higher inside than out. It is inflated so that the smaller night-time pressure of the gas still fully extends the envelope. Such a super-pressure balloon will keep essentially constant level until too much gas diffuses out of it.*

- c) the balloon envelope is equipped with either a radar reflective device(s) or radar reflective material that will present an echo to surface radar operating in the 200 MHz to 2 700 MHz frequency range, and/or the balloon is equipped with such other devices as will permit continuous tracking by the operator beyond the range of ground-based radar.
- 3.4 A heavy unmanned free balloon shall not be operated under the following conditions:
- a) in an area where ground-based SSR equipment is in use, unless it is equipped with a secondary surveillance radar transponder, with pressure-altitude reporting capability, which is continuously operating on an assigned code, or which can be turned on when necessary by the tracking station; or
  - b) in an area where ground-based ADS-B equipment is in use, unless it is equipped with an ADS-B transmitter, with pressure-altitude reporting capability, which is

continuously operating or which can be turned on when necessary by the tracking station.

- 3.5 An unmanned free balloon that is equipped with a trailing antenna that requires a force of more than 230 N to break it at any point shall not be operated unless the antenna has coloured pennants or streamers that are attached at not more than 15 m intervals.
- 3.6 A heavy unmanned free balloon shall not be operated below 18 000 m (60 000 ft) pressure-altitude between sunset and sunrise or such other period between sunset and sunrise (corrected to the altitude of operation) as may be prescribed by the appropriate ATS authority, unless the balloon and its attachments and payload, whether or not they become separated during the operation, are lighted.
- 3.7 A heavy unmanned free balloon that is equipped with a suspension device (other than a highly conspicuously coloured open parachute) more than 15 m long shall not be operated between sunrise and sunset below 18 000 m (60 000 ft) pressure-altitude unless the suspension device is coloured in alternate bands of high conspicuity colours or has coloured pennants attached.

#### **4 TERMINATION**

The operator of a heavy unmanned free balloon shall activate the appropriate termination devices required by 3.3 a) and b) above:

- a) when it becomes known that weather conditions are less than those prescribed for the operation;
- b) if a malfunction or any other reason makes further operation hazardous to air traffic or to persons or property on the surface; or
- c) prior to unauthorized entry into the airspace over another State's territory.

#### **5 FLIGHT NOTIFICATION**

##### **5.1 Pre-flight notification**

- 5.1.1 Early notification of the intended flight of an unmanned free balloon in the medium or heavy category shall be made to the appropriate air traffic services unit not less than seven days before the date of the intended flight.
- 5.1.2 Notification of the intended flight shall include such of the following information as may be required by the appropriate air traffic services unit:
- a) balloon flight identification or project code name;
  - b) balloon classification and description;
  - c) SSR code, aircraft address or NDB frequency as applicable;
  - d) operator's name and telephone number;
  - e) launch site;
  - f) estimated time of launch (or time of commencement and completion of multiple launches);

- g) number of balloons to be launched and the scheduled interval between launches (if multiple launches);
- h) expected direction of ascent;
- i) cruising level(s) (pressure-altitude);
- j) the estimated elapsed time to pass 18 000 m (60 000 ft) pressure-altitude or to reach cruising level if at or below 18 000 m (60 000 ft), together with the estimated location;

*Note – If the operation consists of continuous launchings, the time to be included is the estimated time at which the first and the last in the series will reach the appropriate level (e.g. 122136Z–130330Z).*

- k) the estimated date and time of termination of the flight and the planned location of the impact/recovery area. In the case of balloons carrying out flights of long duration, as a result of which the date and time of termination of the flight and the location of impact cannot be forecast with accuracy, the term “long duration” shall be used.

*Note.— If there is to be more than one location of impact/recovery, each location is to be listed together with the appropriate estimated time of impact. If there is to be a series of continuous impacts, the time to be included is the estimated time of the first and the last in the series (e.g. 070330Z–072300Z).*

- 5.1.3 Any changes in the pre-launch information notified in accordance with 5.1.2 above shall be forwarded to the air traffic services unit concerned not less than 6 hours before the estimated time of launch, or in the case of solar or cosmic disturbance investigations involving a critical time element, not less than 30 minutes before the estimated time of the commencement of the operation.

## 5.2 Notification of launch

Immediately after a medium or heavy unmanned free balloon is launched the operator shall notify the appropriate air traffic services unit of the following:

- a) balloon flight identification;
- b) launch site;
- c) actual time of launch;
- d) estimated time at which 18 000 m (60 000 ft) pressure altitude will be passed, or the estimated time at which the cruising level will be reached if at or below 18 000 m (60 000 ft), and the estimated location; and
- e) any changes to the information previously notified in accordance with 5.1.2 g) and h).

## 5.3 Notification of cancellation

The operator shall notify the appropriate air traffic services unit immediately it is known that the intended flight of a medium or heavy unmanned free balloon, previously notified in accordance with 5.1, has been cancelled.

## **6 POSITION RECORDING AND REPORTS**

- 6.1 The operator of a heavy unmanned free balloon operating at or below 18 000 m (60 000 ft.) pressure-altitude shall monitor the flight path of the balloon and forward reports of the balloon's position as requested by air traffic services. Unless air traffic services require reports of the balloon's position at more frequent intervals, the operator shall record the position every 2 hours.
- 6.2 The operator of a heavy unmanned free balloon operating above 18 000 m (60 000 ft) pressure-altitude shall monitor the flight progress of the balloon and forward reports of the balloon's position as requested by air traffic services. Unless air traffic services require reports of the balloon's position at more frequent intervals, the operator shall record the position every 24 hours.
- 6.3 If a position cannot be recorded in accordance with 6.1 and 6.2, the operator shall immediately notify the appropriate air traffic services unit. This notification shall include the last recorded position. The appropriate air traffic services unit shall be notified immediately when tracking of the balloon is re-established.
- 6.4 One hour before the beginning of planned descent of a heavy unmanned free balloon, the operator shall forward to the appropriate ATS unit the following information regarding the balloon:
- a) the current geographical position;
  - b) the current level (pressure-altitude);
  - c) the forecast time of penetration of 18 000 m (60 000 ft) pressure-altitude, if applicable;
  - d) the forecast time and location of ground impact.
- 6.5 The operator of a heavy or medium unmanned free balloon shall notify the appropriate air traffic services unit when the operation is ended.

## **ATTACHMENT A - INTERCEPTION OF CIVIL AIRCRAFT**

*(Note – See Chapter 3, 3.8 of this MCAR and associated Note)*

*Note – In the interest of completeness, the substance of the provisions in Appendix 2 to the MCAR is incorporated in this Attachment.*

### **1. General**

- 1.1 Interception of civil aircraft shall be avoided and shall be undertaken only as a last resort. If undertaken, the interception shall be limited to determining the identity of the aircraft, unless it is necessary to return the aircraft to its planned track, direct it beyond the boundaries of national airspace, guide it away from a prohibited, restricted or danger area or instruct it to effect a landing at a designated aerodrome. Practice interception of civil aircraft is not to be undertaken.
- 1.2 To eliminate or reduce the need for interception of civil aircraft, it is important that:
- a) all possible efforts be made by intercept control units to secure identification of any aircraft which may be a civil aircraft, and to issue any necessary instructions or advice to such aircraft, through the appropriate air traffic services units. To this end, it is essential that means of rapid and reliable communications between intercept control units and air traffic services units be established and that agreements be formulated concerning exchanges of information between such units on the movements of civil aircraft, in accordance with the provisions of ICAO Annex 11 to the convention on International Civil Aviation;
  - b) areas prohibited to all civil flights and areas in which civil flight is not permitted without special authorization by the State be clearly promulgated in Aeronautical Information Publications (AIP) in accordance with the provisions of ICAO Annex 15 to the convention on International Civil Aviation, together with the risk, if any, of interception in the event of penetration of such areas. When delineating such areas in close proximity to promulgated ATS routes, or other frequently used tracks, States shall take into account the availability and overall systems accuracy of the navigation systems to be used by civil aircraft and their ability to remain clear of the delineated areas;
  - c) the establishment of additional navigation aids be considered where necessary to ensure that civil aircraft are able safely to circumnavigate prohibited or, as required, restricted areas.
- 1.3 To eliminate or reduce the hazards inherent in interceptions undertaken as a last resort, all possible efforts shall be made to ensure coordinated actions by the pilots and ground units concerned. To this end, it is essential that steps be taken to ensure that:
- a) all pilots of civil aircraft be made fully aware of the actions to be taken by them and the visual signals to be used, as specified in Chapter 3 and Appendix 1 of this MCAR;
  - b) operators or pilots-in-command of civil aircraft implement the provisions in ICAO Annex 6, Parts I, II and III to the convention on International Civil Aviation, regarding

- the capability of aircraft to communicate on 121.5 MHz and the availability of interception procedures and visual signals on board aircraft;
- c) all air traffic services personnel be made fully aware of the actions to be taken by them in accordance with the provisions of ICAO Annex 11, Chapter 2 to the convention on International Civil Aviation, and the PANS-ATM (Doc 4444);
  - d) all pilots-in-command of intercepting aircraft be made aware of the general performance limitations of civil aircraft and of the possibility that intercepted civil aircraft may be in a state of emergency due to technical difficulties or unlawful interference;
  - e) clear and unambiguous instructions be issued to intercept control units and to pilots-in-command of potential intercepting aircraft, covering interception manoeuvres, guidance of intercepted aircraft, action by intercepted aircraft, air-to-air visual signals, radio communication with intercepted aircraft, and the need to refrain from resorting to the use of weapons;

*Note – See paragraphs 3 to 8.*

- f) intercept control units and intercepting aircraft be provided with radiotelephony equipment compatible with the technical specifications of ICAO Annex 10, Volume I to the convention on International Civil Aviation, so as to enable them to communicate with intercepted aircraft on the emergency frequency 121.5 MHz;
- g) secondary surveillance radar and/or ADS-B facilities be made available to the extent possible to permit intercept control units to identify civil aircraft in areas where they might otherwise be intercepted. Such facilities shall permit recognition of aircraft identity and immediate recognition of any emergency or urgency conditions.

## **2. Interception manoeuvres**

- 2.1 A standard method shall be established for the manoeuvring of aircraft intercepting a civil aircraft in order to avoid any hazard for the intercepted aircraft. Such method shall take due account of the performance limitations of civil aircraft, the need to avoid flying in such proximity to the intercepted aircraft that a collision hazard may be created and the need to avoid crossing the aircraft's flight path or to perform any other manoeuvre in such a manner that the wake turbulence may be hazardous, particularly if the intercepted aircraft is a light aircraft.
- 2.2 An aircraft equipped with an airborne collision avoidance system (ACAS), which is being intercepted, may perceive the interceptor as a collision threat and thus initiate an avoidance manoeuvre in response to an ACAS resolution advisory. Such a manoeuvre might be misinterpreted by the interceptor as an indication of unfriendly intentions. It is important, therefore, that pilots of intercepting aircraft equipped with a secondary surveillance radar (SSR) transponder suppress the transmission of pressure-altitude information (in Mode C replies or in the AC field of Mode S replies) within a range of at least 37 km (20 NM) of the aircraft being intercepted. This prevents the ACAS in the intercepted aircraft from using resolution advisories in respect of the interceptor, while the ACAS traffic advisory information will remain available.

### 2.3 Manoeuvres for visual identification

The following method shall be used for the manoeuvring of intercepting aircraft for the purpose of visually identifying a civil aircraft:

#### *Phase I*

The intercepting aircraft shall approach the intercepted aircraft from astern. The element leader, or the single intercepting aircraft, shall normally take up a position on the left (port) 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 to the aircraft than 300 m. Any other participating aircraft shall stay well clear of the intercepted aircraft, preferably above and behind. After speed and position have been established, the aircraft shall, if necessary, proceed with Phase II of the procedure.

#### *Phase II*

The element leader, or the single intercepting aircraft, shall begin closing in gently on the intercepted aircraft, at the same level, until no closer than absolutely necessary to obtain the information needed. The element leader, or the single intercepting aircraft, shall use caution to avoid startling the flight crew or the passengers of the intercepted aircraft, keeping constantly in mind the fact that manoeuvres considered normal to an intercepting aircraft may be considered hazardous to passengers and crews of civil aircraft. Any other participating aircraft shall continue to stay well clear of the intercepted aircraft. Upon completion of identification, the intercepting aircraft shall withdraw from the vicinity of the intercepted aircraft as outlined in Phase III.

#### *Phase III*

The element leader, or the single intercepting aircraft, shall break gently away from the intercepted aircraft in a shallow dive. Any other participating aircraft shall stay well clear of the intercepted aircraft and rejoin their leader.

### 2.4 Manoeuvres for navigational guidance

2.4.1 If, following the identification manoeuvres in Phase I and Phase II above, it is considered necessary to intervene in the navigation of the intercepted aircraft, the element leader, or the single intercepting aircraft, shall normally take up a position on the left (port) side, slightly above and ahead of the intercepted aircraft, to enable the pilot-in-command of the latter aircraft to see the visual signals given.

2.4.2 It is indispensable that the pilot-in-command of the intercepting aircraft be satisfied that the pilot-in-command of the intercepted aircraft is aware of the interception and acknowledges the signals given. If repeated attempts to attract the attention of the pilot-in-command of the intercepted aircraft by use of the Series 1 signal in Appendix 1, Section 2 of this MCAR, are unsuccessful, other methods of signalling may be used for this purpose, including as a last resort the visual effect of the reheat/afterburner, provided that no hazard is created for the intercepted aircraft.

2.5 It is recognized that meteorological conditions or terrain may occasionally make it necessary for the element leader, or the single intercepting aircraft, to take up a position on the right (starboard) side, slightly above and ahead of the intercepted aircraft. In such case, the pilot-in-command of the intercepting aircraft must take



particular care that the intercepting aircraft is clearly visible at all times to the pilot-in-command of the intercepted aircraft.

### **3. Guidance of an intercepted aircraft**

- 3.1 Navigational guidance and related information shall be given to an intercepted aircraft by radiotelephony, whenever radio contact can be established.
- 3.2 When navigational guidance is given to an intercepted aircraft, care must be taken that the aircraft is not led into conditions where the visibility may be reduced below that required to maintain flight in visual meteorological conditions and that the manoeuvres demanded of the intercepted aircraft do not add to already existing hazards in the event that the operating efficiency of the aircraft is impaired.
- 3.3 In the exceptional case where an intercepted civil aircraft is required to land in the territory overflown, care must also be taken that:
  - a) the designated aerodrome is suitable for the safe landing of the aircraft type concerned, especially if the aerodrome is not normally used for civil air transport operations;
  - b) the surrounding terrain is suitable for circling, approach and missed approach manoeuvres;
  - c) the intercepted aircraft has sufficient fuel remaining to reach the aerodrome;
  - d) if the intercepted aircraft is a civil transport aircraft, the designated aerodrome has a runway with a length equivalent to at least 2 500 m at mean sea level and a bearing strength sufficient to support the aircraft; and
  - e) whenever possible, the designated aerodrome is one that is described in detail in the relevant Aeronautical Information Publication.
- 3.4 When requiring a civil aircraft to land at an unfamiliar aerodrome, it is essential that sufficient time be allowed it to prepare for a landing, bearing in mind that only the pilot-in-command of the civil aircraft can judge the safety of the landing operation in relation to runway length and aircraft mass at the time.
- 3.5 It is particularly important that all information necessary to facilitate a safe approach and landing be given to the intercepted aircraft by radiotelephony.

### **4. Action by intercepted aircraft**

The Standards in Appendix 2, Section 2 of this MCAR, specify as follows:

“2.1 An aircraft which is intercepted by another aircraft shall immediately:

- a) follow the instructions given by the intercepting aircraft, interpreting and responding to visual signals in accordance with the specifications in Appendix 1 of this MCAR;
- b) notify, if possible, the appropriate air traffic services unit;
- c) attempt to establish radio-communication with the intercepting aircraft or with the appropriate intercept control unit, by making a general call on the emergency frequency 121.5 MHz, giving the identity of the intercepted aircraft and the nature

of the flight; and if no contact has been established and if practicable, repeating this call on the emergency frequency 243 MHz;

- d) if equipped with SSR transponder, select Mode A, Code 7700, unless otherwise instructed by the appropriate air traffic services unit.
- e) if equipped with ADS-B or ADS-C, select the appropriate emergency functionality, if available, unless otherwise instructed by the appropriate air traffic services unit.

“2.2 If any instructions received by radio from any sources conflict with those given by the intercepting aircraft by visual signals, the intercepted aircraft shall request immediate clarification while continuing to comply with the visual instructions given by the intercepting aircraft.

“2.3 If any instructions received by radio from any sources conflict with those given by the intercepting aircraft by radio, the intercepted aircraft shall request immediate clarification while continuing to comply with the radio instructions given by the intercepting aircraft.”

**5. Air-to-air visual signals**

The visual signals to be used by intercepting and intercepted aircraft are those set forth in Appendix 1 to this MCAR. It is essential that intercepting and intercepted aircraft adhere strictly to those signals and interpret correctly the signals given by the other aircraft, and that the intercepting aircraft pay particular attention to any signals given by the intercepted aircraft to indicate that it is in a state of distress or urgency.

**6. Radio communication between the intercept control unit or the intercepting aircraft and the intercepted aircraft**

6.1 When an interception is being made, the intercept control unit and the intercepting aircraft shall:

- a) first attempt to establish two-way communication with the intercepted aircraft in a common language on the emergency frequency 121.5 MHz, using the call signs “INTERCEPT CONTROL”, “INTERCEPTOR (call sign)” and “INTERCEPTED AIRCRAFT” respectively; and
- b) failing this, attempt to establish two-way communication with the intercepted aircraft on such other frequency or frequencies as may have been prescribed by the appropriate ATS unit(s).

6.2 If radio contact is established during interception but communication in a common language is not possible, attempts must be made to convey instructions, acknowledgement of instructions and essential information by using the phrases and pronunciations in Table A-1 and transmitting each phrase twice.

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<i>Phrases for use by INTERCEPTING aircraft</i>	<i>Phrases for use by INTERCEPTED aircraft</i>
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<i>Phrase</i>	<i>Pronunciation<sup>1</sup></i>	<i>Meaning</i>	<i>Phrase</i>	<i>Pronunciation<sup>1</sup></i>	<i>Meaning</i>
CALL SIGN	<u>KOL</u> SA-IN	What is your call sign?	CALL SIGN (call sign) <sup>2</sup>	<u>KOL</u> SA-IN (call sign)	My call sign is (call sign)
FOLLOW	<u>FOL</u> -LO	Follow me	WILCO	<u>VILL</u> -KO	Understood
DESCEND	DEE- <u>SEND</u>	Descend for landing			Will comply
YOU LAND	<u>YOU LAAND</u>	Land at this aerodrome	CAN NOT	<u>KANN</u> NOTT	Unable to comply
PROCEED	PRO- <u>SEED</u>	You may proceed	REPEAT	REE- <u>PEET</u>	Repeat your instruction
			AM LOST	<u>AM LOSST</u>	Position unknown
			MAYDAY	<u>MAYDAY</u>	I am in distress
			HIJACK <sup>3</sup>	<u>HI-JACK</u>	I have been hijacked
			LAND (place name)	LAAND (place name)	I request to land at (place name)
			DESCEND	DEE- <u>SEND</u>	I require descent

1. In the second column, syllables to be emphasized are underlined.
2. The call sign required to be given is that used in radiotelephony communications with air traffic services units and corresponding to the aircraft identification in the flight plan.
3. Circumstances may not always permit, nor make desirable, the use of the phrase "HIJACK".

## 7. Refraining from the use of weapons

The use of tracer bullets to attract attention is hazardous, and it is expected that measures will be taken to avoid their use so that the lives of persons on board and the safety of aircraft will not be endangered.

## 8. Coordination between intercept control units and air traffic services units

It is essential that close coordination be maintained between an intercept control unit and the appropriate air traffic services unit during all phases of an interception of an aircraft which is, or might be, a civil aircraft, in order that the air traffic services unit is kept fully informed of the developments and of the action required of the intercepted aircraft.

## **ATTACHMENT B - UNLAWFUL INTERFERENCE**

### **1. General**

The following procedures are intended as guidance for use by aircraft when unlawful interference occurs, and the aircraft is unable to notify an ATS unit of this fact.

### **2. Procedures**

- 2.1 If the pilot-in-command cannot proceed to an aerodrome in accordance with the rules in Chapter 3, 3.7.2, he/she should attempt to continue flying on the assigned track and at the assigned cruising level at least until able to notify an ATS unit or until within radar or ADS-B coverage.
- 2.2 When an aircraft subjected to an act of unlawful interference must depart from its assigned track or its assigned cruising level without being able to make radiotelephony contact with ATS, the pilot-in-command should, whenever possible:
- a) attempt to broadcast warnings on the VHF channel in use or the VHF emergency frequency, and other appropriate channels, unless considerations aboard the aircraft dictate otherwise. Other equipment such as on-board transponders and data links should also be used when it is advantageous to do so and circumstances permit; and
  - b) proceed in accordance with applicable special procedures for in-flight contingencies, where such procedures have been established and promulgated in the Regional Supplementary Procedures (Doc 7030); or
  - c) if not applicable, regional procedures have been established, proceed at a level which differs from the cruising levels normally used for IFR flight by:
    - 1) 150 m (500 ft) in an area where a vertical separation minimum of 300 m (1 000 ft) is applied; or
    - 2) 300 m (1 000 ft) in an area where a vertical separation minimum of 600 m (2 000 ft) is applied.