



GOVERNMENT OF INDIA

OFFICE OF DIRECTOR GENERAL OF CIVIL AVIATION

TECHNICAL CENTRE, OPP SAFDARJANG AIRPORT, NEW DELHI

CIVIL AVIATION REQUIREMENTS

SECTION 9 – AIR SPACE AND

AIR NAVIGATION SERVICES

STANDARDS ~~TRAFFIC~~

~~MANAGEMENT~~

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INTRODUCTION

Article 12 (Rules of the air) of the Convention on International Civil Aviation requires each contracting State to adopt measures to insure that every aircraft (irrespective of its nationality mark) flying over or maneuvering within its territory shall comply with the rules and regulations relating to the flight and maneuver of aircraft there in force. Under the Convention, each Contracting State is required to keep its own regulations in these respects uniform, to the greatest possible extent, with those established from time to time under the Convention and is also required to insure the prosecution of all persons violating the regulations applicable. Over the high seas, the rules in force as established under the Convention shall be followed.

In above respect, ICAO Annex 2 provides the Standards pertaining to the Rules of the Air which are required to be adopted by the Contracting State.

Rule 16 of the Aircraft Rules, 1937 stipulates that every person shall comply with Rules of the Air issued by the Director General in accordance with Annex 2 as may be applicable to that person and every pilot and every person-in-charge of an aircraft shall take such steps as are practicable to secure that when the aircraft is in flight or is being maneuvered on the land or water, the windows, wind-screens or side-screen of the aircraft through which the pilots obtain the view forward or sideways are maintained in such a condition as not to obstruct his view. This CAR is issued under the provisions of Rule 16 and Rule 133A of the Aircraft Rules, 1937.

This CAR is issued in supersession of CAR Section 4 Series E Part I, Issue I dated 15th July 2004.

1. DEFINITIONS

Note. — 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.

When the following terms are used in the DGCA Standards for Rules of the Air, they have the following meanings:

Acrobatic flight. Manoeuvres intentionally performed by an aircraft involving an abrupt change in its attitude, an abnormal attitude, or an abnormal variation in speed.

ADS-C agreement. reporting plan which establishes the conditions of ADS-C data reporting (i.e. data required by the air traffic services unit and frequency of ADS-C reports which have to be agreed to prior to using ADS-C in the provision of air traffic services).

Note. — The terms of the agreement will be exchanged between the ground system and the aircraft by means of a contract, or a series of contracts.

Automatic dependent surveillance — broadcast (ADS-B). A means by which aircraft, aerodrome vehicles and other objects can automatically transmit and/or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link.

Automatic dependent surveillance — contract (ADS-C). A means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports.

Note. — The abbreviated term “ADS contract” is commonly used to refer to ADS event contract, ADS demand contract, ADS periodic contract or an emergency mode.

Advisory airspace. An airspace of defined dimensions, or designated route, within which air traffic advisory service is available.

Advisory route. A designated route along which air traffic advisory service is available.

Aerodrome. A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Aerodrome control service. Air traffic control service for aerodrome traffic.

Aerodrome control tower. A unit established to provide air traffic control service to aerodrome traffic.

Aerodrome traffic. All traffic on the maneuvering area of an aerodrome and all aircraft flying in the vicinity of an aerodrome.

Note. — An aircraft is in the vicinity of an aerodrome when it is in, entering or leaving an aerodrome traffic circuit.

Aerodrome traffic zone. An airspace of defined dimensions established around an aerodrome for the protection of aerodrome traffic.

Aeronautical Information Publication (AIP). A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

Aeronautical station. A land station in the aeronautical mobile service. In certain instances, an aeronautical station may be located, for example, on board ship or on a platform at sea.

Aeroplane. A power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

Airborne collision avoidance system (ACAS). An aircraft system based on secondary surveillance radar (SSR) transponder signals which operates independently of ground-based equipment to provide advice to the pilot on potential conflicting aircraft that are equipped with SSR transponders.

Aircraft. Any machine which can derive support in the atmosphere from the reactions of the air other than reactions of the air against the earth's surface and includes balloons whether fixed or free, airships, kites, gliders and flying machines.

Air-ground control radio station. An aeronautical telecommunication station having primary responsibility for handling communications pertaining to the operation and control of aircraft in a given area.

Air-taxiing. Movement of a helicopter/VTOL above the surface of an aerodrome, normally in ground effect and at a ground speed normally less than 37 km/h (20 kt).

Air traffic. All aircraft in flight or operating on the manoeuvring area of an aerodrome.

Air traffic advisory service. A service provided within advisory airspace to ensure separation, in so far as practical, between aircraft which are operating on IFR flight plans.

Air traffic control clearance. Authorization for an aircraft to proceed under conditions specified by an air traffic control unit.

Note 1. — For convenience, the term “air traffic control clearance” is frequently abbreviated to “clearance” when used in appropriate contexts.

Note 2. — The abbreviated term “clearance” may be prefixed by the words “taxi”, “take-off”, “departure”, “en route”, “approach” or “landing” to indicate the particular portion of flight to which the air traffic control clearance relates.

Air traffic control service. A service provided for the purpose of:

- a) preventing collisions:
 - 1) between aircraft, and
 - 2) on the maneuvering area between aircraft and obstructions; and
- b) expediting and maintaining an orderly flow of air traffic.

Air traffic control unit. A generic term meaning variously, area control centre, approach control unit or aerodrome control tower.

Air traffic service. A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).

Air traffic services airspaces. Airspaces of defined dimensions, alphabetically designated, within which specific types of flights may operate and for which air traffic services and rules of operation are specified.

Note. — ATS airspaces are classified in AIP India ENR 1.4.

Air traffic services reporting office. A unit established for the purpose of receiving reports concerning air traffic services and flight plans submitted before departure.

Note. — An air traffic services reporting office may be established as a separate unit or combined with an existing unit, such as another air traffic services unit, or a unit of the aeronautical information service.

Air traffic services unit. A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office.

Airway. A control area or portion thereof established in the form of a corridor.

Alerting service. A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required.

Alternate aerodrome. An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing. Alternate aerodromes include the following:

Take-off alternate. An alternate aerodrome at which an aircraft can land should this become necessary shortly after take-off and it is not possible to use the aerodrome of departure.

En-route alternate. An aerodrome at which an aircraft would be able to land after experiencing an abnormal or emergency condition while en route.

ETOPS en-route alternate. A suitable and appropriate alternate aerodrome at which an aeroplane would be able to land after experiencing an engine shut-down or other abnormal or emergency condition while en route in an ETOPS operation.

Destination alternate. An alternate aerodrome to which an aircraft may proceed should it become either impossible or inadvisable to land at the aerodrome of intended landing.

Note. — The aerodrome from which a flight departs may also be an en-route or a destination alternate aerodrome for that flight.

Altitude. The vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL).

Approach control service. Air traffic control service for arriving or departing controlled flights.

Approach control unit. A unit established to provide air traffic control service to controlled flights arriving at, or departing from, one or more aerodromes.

Appropriate ATS authority. The relevant authority designated by the State responsible for providing air traffic services in the airspace concerned.

Appropriate authority.

- a) *Regarding flight over the high seas: The relevant authority of the State of Registry.*
- b) *Regarding flight other than over the high seas: The relevant authority of the State having sovereignty over the territory being overflown.*

Apron. A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.

Area control centre. A unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction.

Area control service. Air traffic control service for controlled flights in control areas.

Area navigation (RNAV). A method of navigation which A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

Note. — Area navigation includes performance based navigation as well as other operations that do not meet the definition of performance based navigation.

ATS route. A specified route designed for channeling the flow of traffic as necessary for the provision of air traffic services.

Note 1. — The term “ATS route” is used to mean variously, airway, advisory route, controlled or uncontrolled route arrival or departure route, etc.

Note 2.— An ATS route is defined by route specifications which include an ATS route designator, the track to or from significant points (way-points), distance between significant points, reporting requirements and, as determined by the appropriate ATS authority, the lowest safe altitude.

Ceiling. The height above the ground or water of the base of the lowest layer of cloud below 6,000 metres (20,000 feet) covering more than half the sky.

Change-over point. The point at which an aircraft navigating on an ATS route segment defined by reference to very high frequency omnidirectional radio ranges is expected to transfer its primary navigational reference from the facility behind the aircraft to the next facility ahead of the aircraft.

Note.— Change-over points are established to provide the optimum balance in respect of signal strength and quality between facilities at all levels to be used and to ensure a common source of azimuth guidance for all aircraft operating along the same portion of a route segment.

Clearance limit. The point to which an aircraft is granted an air traffic control clearance.

Command and control link (C2). The data link between the remotely piloted aircraft and the remote pilot station for the purposes of managing the flight.

Control area. A controlled airspace extending upwards from a specified limit above the earth.

Controlled aerodrome. An aerodrome at which air traffic control service is provided to aerodrome traffic.

Note. — *The term “controlled aerodrome” indicates that air traffic control service is provided to aerodrome traffic but does not necessarily imply that a control zone exists.*

Controlled airspace. An airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification.

Note. — *Controlled airspace is a generic term which covers ATS airspace.*

Controlled flight. Any flight which is subject to an air traffic control clearance.

Controller-pilot data link communications (CPDLC). A means of communication between controller and pilot, using data link for ATC communications.

Control zone. A controlled airspace extending upwards from the surface of the earth to a specified upper limit.

Cruise climb. An aeroplane cruising technique resulting in a net increase in altitude as the aeroplane mass decreases.

Cruising level. A level maintained during a significant portion of a flight.

Current flight plan. The flight plan, including changes, if any, brought about by subsequent clearances.

Danger area. An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.

Data link communications. A form of communication intended for the exchange of messages via a data link.

Detect and avoid. The capability to see, sense or detect conflicting traffic or other hazards and take the appropriate action.

Estimated off-block time. The estimated time at which the aircraft will commence movement associated with departure.

Estimated time of arrival. For IFR flights, the time at which it is estimated that the aircraft will arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the aerodrome, the time at which the aircraft will arrive over the aerodrome. For VFR flights, the time at which it is estimated that the aircraft will arrive over the aerodrome.

Expected approach time. The time at which ATC expects that an arriving aircraft, following a delay, will leave the holding fix to complete its approach for a landing.

Note. — The actual time of leaving the holding fix will depend upon the approach clearance.

Filed flight plan. The flight plan as filed with an ATS unit by the pilot or a designated representative, without any subsequent changes.

Flight crew member. A licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period.

Flight information centre. A unit established to provide flight information service and alerting service.

Flight information region. An airspace of defined dimensions within which flight information service and alerting service are provided.

Flight information service. A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.

Flight level. A surface of constant atmospheric pressure which is related to a specific pressure datum, 1013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals.

Note 1. — A pressure type altimeter calibrated in accordance with the Standard Atmosphere:

- a) when set to a QNH altimeter setting, will indicate altitude;*
- b) when set to a QFE altimeter setting, will indicate height above the QFE reference datum;*
- c) when set to a pressure of 1013.2 hPa, may be used to indicate flight levels.*

Note 2. — The terms “height” and “altitude”, used in Note 1 above, indicate altimetric rather than geometric heights and altitudes.

Flight plan. Specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft.

Flight visibility. The visibility forward from the cockpit of an aircraft in flight.

Ground visibility. The visibility at an aerodrome, as reported by an accredited observer or by automatic system.

Heading. The direction in which the longitudinal axis of an aircraft is pointed, usually expressed in degrees from North (true, magnetic, compass or grid).

Height. The vertical distance of a level, a point or an object considered as a point, measured from a specified datum.

IFR. The symbol used to designate the instrument flight rules.

IFR flight. A flight conducted in accordance with the instrument flight rules.

IMC. The symbol used to designate instrument meteorological conditions.

Instrument approach operations. An approach and landing using instruments for navigation guidance based on an instrument approach procedure. There are two methods for executing instrument approach operations:

- a) a two-dimensional (2D) instrument approach operation, using lateral navigation guidance only; and
- b) a three-dimensional (3D) instrument approach operation, using both lateral and vertical navigation guidance.

Note. — Lateral and vertical navigation guidance refers to the guidance provided either by:

- a) a ground-based radio navigation aid; or*
- b) computer-generated navigation data from ground-based, space-based, self-contained navigation aids or a combination of these.*

Instrument approach procedure (IAP). A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply. Instrument approach procedures are classified as follows:

Non-precision approach (NPA) procedure. An instrument approach procedure designed for 2D instrument approach operations Type A.

Note. — Non-precision approach procedures may be flown using a continuous descent final approach technique (CDFA). CDFA with advisory VNAV guidance calculated by on-board equipment (See PANS-OPS (Doc 8168), Volume I, Part I, Section 4, Chapter 1, paragraph 1.8.1) are considered 3D instrument approach operations. CDFA with manual calculation of the required rate of descent are considered 2D instrument approach operations. For more information on CDFA refer to PANS-OPS (Doc. 8168) Volume I, Section 1.7 and 1.8.

Approach procedure with vertical guidance (APV). A performance-based navigation (PBN) instrument approach procedure designed for 3D instrument approach operations Type A

Precision approach (PA) procedure. An instrument approach procedure based on navigation systems (ILS, MLS, GLS and SBAS Cat I) designed for 3D instrument approach operations Type A or B.

Note. — Refer to Annex 6 for instrument approach operation types.

Instrument meteorological conditions. Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for visual meteorological conditions.

Note. — The specified minima for visual meteorological conditions are contained para 2.4

Landing area. That part of a movement area intended for the landing or take-off of aircraft.

Level. A generic term relating to the vertical position of an aircraft in flight and meaning variously, height, altitude or flight level.

Manoeuvring area. That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.

Movement area. That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron(s).

Night. Hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise, as may be prescribed by the appropriate authority. Civil twilight ends in the evening when the centre of the sun's disc is 6 degrees below the horizon and begins in the morning when the centre of the sun's disc is 6 degrees below the horizon.

Operator. A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Note. In the context of remotely piloted aircraft, an aircraft operation includes the remotely piloted aircraft system.

Pilot-in-command. in respect of a pilot, -

- (i) engaged in commercial operations means the pilot designated by the operator as being in command and charged with the safe conduct of a flight; and

- (ii) engaged in general aviation or helicopter operations means the pilot designated by the operator or owner as being in command and charged with the safe conduct of a flight.

Pressure-altitude. An atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the Standard Atmosphere.

Problematic use of substances. The use of one or more psychoactive substances by aviation personnel in a way that:

- a) constitutes a direct hazard to the user or endangers the lives, health or welfare of others; and/or
- b) causes or worsens an occupational, social, mental or physical problem or disorder.

Prohibited area. An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.

Psychoactive substances. Alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psychostimulants, hallucinogens, and volatile solvents, whereas coffee and tobacco are excluded.

Radiotelephony. A form of radio-communication primarily intended for the exchange of information in the form of speech.

Remote pilot. A person charged by the operator with duties essential to the operation of a remotely piloted aircraft and who manipulates the flight controls, as appropriate, during flight time.

Remote pilot station. The component of the remotely piloted aircraft system containing the equipment used to pilot the remotely piloted aircraft.

Remotely piloted aircraft (RPA). An unmanned aircraft which is piloted from a remote pilot station.

Remotely piloted aircraft system (RPAS). A remotely piloted aircraft, its associated remote pilot station(s), the required command and control links and any other components as specified in the type design.

RPA observer. A trained and competent person designated by the operator who, by visual observation of the remotely piloted aircraft, assists the remote pilot in the safe conduct of the flight.

Repetitive flight plan (RPL). A flight plan related to a series of frequently recurring, regularly operated individual flights with identical basic features, submitted by an operator for retention and repetitive use by ATS units.

Reporting point. A specified geographical location in relation to which the position of an aircraft can be reported.

Restricted area. An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions.

Runway. A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

Runway-holding position. A designated position intended to protect a runway, an obstacle limitation surface, or an ILS/MLS critical/sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorized by the aerodrome control tower.

Note: In radiotelephony phraseologies, the expression "holding Point" is used to designate the runway-holding position.

Safety-sensitive personnel. Persons who might endanger aviation safety if they perform their duties and functions improperly including, but not limited to, crew members, aircraft maintenance personnel and air traffic controllers.

Signal area. An area on an aerodrome used for the display of ground signals.

Special VFR flight. A VFR flight cleared by air traffic control to operate within a control zone in meteorological conditions below VMC.

Taxiing. Movement of an aircraft on the surface of an aerodrome under its own power, excluding take-off and landing.

Taxiway. A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including:

- a) *Aircraft stand taxilane.* A portion of an apron designated as a taxiway and intended to provide access to aircraft stands only.
- b) *Apron taxiway.* A portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron.
- c) *Rapid exit taxiway.* A taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimizing runway occupancy times.

Terminal control area. A control area normally established at the confluence of ATS routes in the vicinity of one or more major aerodromes.

Total estimated elapsed time. For IFR flights, the estimated time required from take-off to arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the destination aerodrome, to arrive over the destination aerodrome. For VFR flights, the estimated time required from take-off to arrive over the destination aerodrome.

Track. The projection on the earth's surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic or grid).

Traffic avoidance advice. Advice provided by an air traffic services unit specifying maneuvers to assist a pilot to avoid a collision.

Traffic information. Information issued by an air traffic services unit to alert a pilot to other known or observed air traffic which may be in proximity to the position or intended route of flight and to help the pilot avoid a collision.

Transition altitude. The altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes.

Unmanned free balloon. A non-power-driven, unmanned, lighter-than-air aircraft in free flight.

Note. — *Unmanned free balloons are classified as heavy, medium or light in accordance with specifications contained in Appendix 5.*

VFR. The symbol used to designate the visual flight rules.

VFR flight. A flight conducted in accordance with the visual flight rules.

Visibility. Visibility for aeronautical purposes is the greater of:

- a) the greatest distance at which a black object of suitable dimensions, situated near the ground, can be seen and recognized when observed against a bright background;
- b) the greatest distance at which lights in the vicinity of 1000 candelas can be seen and identified against an unlit background.

Note 1. — *The two distances have different values in air of a given extinction coefficient, and the latter b) varies with the background illumination. The former a) is represented by the meteorological optical range (MOR).*

Note. 2. — *The definition applies to the observations of visibility in local routine and special reports, to the observations of prevailing and minimum visibility reported in METAR and SPECI and to the observations of ground visibility.*

Visual line-of-sight (VLOS) operation. An operation in which the remote pilot or RPA observer maintains direct unaided visual contact with the remotely piloted aircraft.

Visual meteorological conditions. Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, equal to or better than specified minima.

Note. — The specified minima are contained para 2.4.

VMC. The symbol used to designate visual meteorological conditions.

2. APPLICABILITY OF THE RULES OF THE AIR

2.1 Territorial application of the rules of the air

- 2.1.1 This CAR is applicable to all aircraft flying over Indian Territory and aircraft bearing the Indian 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.

Note.— The Council of the International Civil Aviation Organization resolved, in adopting Annex 2 in April 1948 and Amendment 1 to the said Annex in November 1951, that the Annex constitutes Rules relating to the flight and manoeuvre of aircraft within the meaning of Article 12 of the Convention. Over the high seas, therefore, these rules apply without exception.

- 2.1.2 For purposes of flight over those parts of the high seas where a Contracting State has accepted, pursuant to a regional air navigation agreement, the responsibility of providing air traffic services, the “appropriate ATS authority” referred to in this CAR is the relevant authority designated by the State responsible for providing those services.

Note. — 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.

2.2 Compliance with the Rules of the air

- 2.2.1 The operation of an aircraft either in flight or on the movement area of an aerodrome shall be in compliance with the general rules and, in addition, when in flight, either with:
- a) the visual flight rules, or
 - b) the instrument flight rules.

Note 1. – Information relevant to the services provided to aircraft operating in accordance with both visual flight rules and instrument flight rules in the ATS airspace classes is contained in AIP (India) ENR 1.4.

Note 2. — 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.

Note 3. — Local flights as may be exempted by Air Traffic Control and such training flights of Flying Club aircraft as may be cleared by Air Traffic Control may be operated during night in Visual Meteorological Conditions.

For this purpose local flight is a flight wholly conducted in the immediate vicinity of an aerodrome.

Note 4. — Information on civil twilight periods of major aerodromes is given in AIP (India) GEN 2.7 SUNRISE/ SUNSET tables.

- 2.2.2 The Director-General may prescribe, from time to time, certain further restrictions in the choice of rules by requiring compliance with Instrument Flight Rules under circumstances not mentioned above.

2.3 Responsibility for compliance with the rules of the air

2.3.1 Responsibility of pilot-in-command

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 the rules of the air, except that the pilot-in-command may depart from these rules in circumstances that render such departure absolutely necessary in the interests of safety.

2.3.2 Pre-flight action

Before beginning a flight, the pilot-in-command of an aircraft shall become familiar with all available information appropriate to the intended operation. Pre-flight action for flights away from the vicinity of an aerodrome, and for all IFR flights, shall include a careful study of available current weather reports and forecasts, 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

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

No person whose function is critical to the safety of aviation (safety-sensitive personnel) shall undertake that function while under the influence of any psychoactive substance, by reason of which human performance is impaired. No such person shall engage in any kind of problematic use of substances.

3. GENERAL RULES

3.1 Protection of persons and property

3.1.1 Negligent or reckless operation of aircraft

An aircraft shall not be operated in a negligent or reckless manner so as to endanger life or property of others.

3.1.2 Minimum safe heights

Except when necessary for take-off or landing, or except by permission from the Director General, 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.

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

Notwithstanding anything contained above, the Director-General may, by order in writing, permit, subject to such conditions and restrictions as he may deem fit to impose, any aircraft engaged in aerial spraying or crop dusting, mining exploration to fly at or above such height as may be specified in the order.

3.1.3 Cruising levels

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.

Note. — The system of flight levels is prescribed in the Appendix 3.

3.1.4 Dropping or spraying

Nothing shall be dropped or sprayed from an aircraft in flight except under conditions prescribed in Rule 26 of the Aircraft Rules, 1937 and as indicated by relevant information, advice and/or clearance from the appropriate air traffic services unit.

3.1.5 Towing

No aircraft shall be towed by an aircraft. Objects other than an aircraft shall be towed by an aircraft, in accordance with requirements prescribed by the Director General and as indicated by relevant information, advice and/or clearance from the appropriate Air traffic services units.

3.1.6 Parachute descents

No person shall, except in an emergency, descend by means of a parachute from an aircraft and no person shall drop or cause or permit to be dropped from an aircraft in flight any article, whether attached to a parachute or not, unless the descent is made or the article is dropped in accordance with the subject to any conditions or limitations contained in general or special order of the Central Government in writing in that behalf. (*Rule 26 of the Aircraft Rules, 1937*).

3.1.7 Acrobatic flight

No aircraft shall be flown acrobatically except under conditions as prescribed below and as indicated by relevant information, advice and/or clearance from the appropriate air traffic services unit.

3.1.7.1 When an aircraft is used for aerobatics -

- (a) it shall be flown by a licensed pilot, or if it is flown by a person for the purpose of qualifying for a licence under these rules, such person shall be accompanied by a licensed pilot instructor;
- (b) if passengers are carried, whether the carriage is public transport or not, their previous consent to the performance of aerobatics shall be obtained in writing;
- (c) the pilot or person in charge of aircraft shall satisfy himself before commencing the flight that every person carried in the aircraft is properly secured by safety belts; and
- (d) the aerobatics shall be commenced at such a height that will permit completion of the manoeuvre at a height of not less than 600 metres (2000 feet) above the ground or above such higher height as may be specified in the certificate of airworthiness issued in respect of an aircraft in aerobatic category.

3.1.7.2 No person shall fly acrobatically;

- (a) so as to constitute hazard to air traffic;
- (b) in the vicinity of an aerodrome at a distance of less than two nautical miles from the nearest point of the perimeter of the aerodrome unless flown at height greater than 1800 meters (6000 ft);
- (c) when flying over any city, town, Village site or populous area; or

when flying over any meeting for public; games or sports or other public assembly, except where a request for such flying has been made in writing to Director General by the promoters of such meeting and assembly.

3.1.8 Formation flights

No civil aircraft shall be flown in formation.

3.1.9 A remotely piloted aircraft shall be operated in such a manner as to minimize hazards to persons, property or other aircraft and in accordance with the conditions specified in Appendix 4 of Annex 2 of the convention.

Note: Operations of RPA over Indian Territory is confined for defence and government security agencies requirement

3.1.10 Unmanned free balloons

An unmanned free balloon shall be operated 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

Aircraft shall not be flown in a prohibited area, or in a restricted area, the particulars of which have been duly published, except in accordance with the conditions of the restrictions or by permission of the State over whose territory the areas are established.

3.1.11.1 Prohibited areas

Aircraft shall not be flown in a prohibited area as has been specified in Schedule I of Aircraft Rules 1937.

3.1.11.2 Restricted areas

Aircraft shall not be flown in a restricted area as published in the AIP (India) ENR 5.1 except in accordance with the conditions of the restrictions or by permission of the Director General.

3.2 Avoidance of collisions

Nothing in these rules shall relieve the pilot-in-command of an aircraft from the responsibility of taking such action, including collision avoidance manoeuvres based on resolution advisories provided by ACAS equipment, as well as avert collision.

Note 1.— It is important that vigilance for the purpose of detecting potential collisions be exercised on board an aircraft, regardless of the type of flight or the class of airspace in which the aircraft is operating, and while operating on the movement area of an aerodrome.

Note 2. — Carriage requirements for ACAS equipment are given in CAR Section 2 Series I, Part VIII and AIC 03/2004 along with the Operating procedures for use of ACAS.

3.2.1 Proximity

An aircraft shall not be operated in such proximity to other aircraft as to create a collision hazard.

3.2.2 Right-of-way

The aircraft that has the right-of-way shall maintain its 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, under or in front of the other, unless it passes 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

3.2.2.5.3 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.

3.2.2.5.4 *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 manoeuvring 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 Annex 14, Volume I, 5.2.9 and 5.4.2.

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 Annex 8. Specifications for navigation lights for aeroplanes are contained in the Appendix 6. Detailed technical specifications for lights for aeroplanes are contained in Part III of the Airworthiness Technical Manual (Doc 9051) and for helicopters in Part IV 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.

Note 3. — For aircraft on the water see 3.2.6.2.

3.2.3.1 Except as provided by 3.2.3.5, from sunset to sunrise or during any other period which may be prescribed by Director General all aircraft in flight shall display:

- 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 specified in the Airworthiness Technical Manual (Doc 9051) 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 Director General,

- 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

An aircraft shall not be flown under 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. The safety pilot shall have 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 that of the safety pilot.

3.2.4.1 Operation on and in the vicinity of an aerodrome

3.2.4.2 An aircraft operated 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.

3.2.4.3 When an aerodrome control tower is in operation at an aerodrome the Pilot-in-command shall also,

- a) maintain a continuous listening watch on the appropriate radio frequency of the aerodrome control tower unless under approach control service furnished by another Air Traffic Control unit and if this is not possible, keep a watch for such instructions as may be issued by visual signals, and
- b) obtain either by radio or by visual signals prior authorization for any manoeuvre preparatory to or associated with taxiing, landing or take off.

Note — See 3.6.5.1.

3.2.5 Water operations

Note.— In addition to the provisions of 3.2.6.1 of this CAR, 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.

3.2.5.1 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.

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

3.2.5.1.2 *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.

3.2.5.1.3 *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.

3.2.5.1.4 *Landing and taking off.* Aircraft landing on or taking off from the water shall, in so far as practicable, keep well clear of all vessels and avoid impeding their navigation.

3.2.5.2 *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 Director General, 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 Appendix 6.

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 3.2.6.2 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 areas, or along designated routes, when so required by the appropriate ATS authority to

facilitate the provision of flight information, alerting and search and rescue services;

- d) any flight within or into designated areas, or along designated routes, when so required by the appropriate ATS authority to facilitate co-ordination with appropriate military units or with air traffic services units in adjacent States in order to avoid the possible need for interception for the purpose of 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 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, unless arrangements have been made for submission of repetitive flight plans

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

A flight plan shall comprise information regarding such of the following items as are considered relevant by the appropriate ATS authority:

- 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

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 1. — 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.

Note 2. — Procedures for submission of changes to repetitive flight plans are contained in the PANS-RAC, Part II (Doc 4444).

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, shall be made as soon as practicable after landing and by the quickest means available to the nearest air traffic services unit/ Flight Information Centre.
- 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. 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. 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, aircraft shall take such action as may be required by the interpretation of the signal given in that Appendix.

- 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 signalman 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 authorized by an organization approved by the DGCA to carry out the functions of a signalman.
- 3.4.5 The signalman 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-coloured 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 Co-ordinated 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.

Note. — Such time check is normally obtained from an air traffic services unit unless other arrangements have been made by the operator or by the appropriate ATS authority.

- 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. — Submission and acceptance of a flight plan does not authorize entry into the controlled airspace. Air Traffic Control clearance must be obtained from the appropriate Air Traffic Services unit before entry.

Note 2. — 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 3. — 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 *Potential reclearance in flight.* If prior to departure it is anticipated that depending on fuel endurance and subject to reclearance in flight, a decision may be taken to proceed to a revised destination aerodrome, 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.

Note. — The intent of this provision is to facilitate a reclearance to a revised destination, normally beyond the filed 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 for a controlled flight within the tolerances defined in paragraphs 3.6.2.1.1 to 3.6.2.2 unless a request for a change has been made and clearance obtained from the appropriate air traffic control unit, or unless 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 omnidirectional 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 change-over 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 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 by plus or minus Mach 0.02 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, change in excess of two minutes from that notified to air traffic services, or such other period of time as is prescribed by the appropriate ATS authority or on the basis of regional air navigation agreements, the flight crew shall notify the appropriate air traffic services unit as soon as possible .

3.6.2.2.1 When ADS-C services are provided and ADS-C is activated, 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 *Changes Requests.* Requests for current flight plan changes shall include information as indicated hereunder:

a) *Change of cruising level:* aircraft identification; requested new cruising level and cruising Mach number/true air-speed at this level, revised time estimates (when applicable) at subsequent reporting points or 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.* When it becomes evident that flight in VMC in accordance with its current flight plan will not be practicable, a VFR flight operated as a controlled flight 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, the time and level of passing each designated compulsory reporting point, together with any other required information. 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, position reports shall be made at intervals prescribed by the appropriate ATS authority or 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.

Note.— The conditions and circumstances in which ADS-B or SSR Mode C transmission of pressure-altitude satisfies the requirement for level information in position reports are indicated in the PANS-RAC, Part II (Doc 4444).

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 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. — SELCAL or similar automatic signalling devices satisfy the requirement to maintain an air-ground voice communication watch.

Note 2. — The requirement for an aircraft to maintain air-ground voice communication watch remains in effect after CPDLC has been established.

3.6.5.2 *Communication failure.* If a communication failure precludes compliance with 3.6.5.1, the aircraft shall comply with the communication failure procedures of Annex 10, Volume II, and with such of the following procedures as are appropriate. The aircraft shall attempt to establish communications with the appropriate air traffic control unit using all other available means. In addition, 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 If in visual meteorological conditions, the aircraft 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 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), the aircraft shall:

a) 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, 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;

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 area navigation (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 c) below, hold over this aid or fix until commencement of descent;

e) commence descent from the navigation aid or fix specified in b) 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 thirty minutes after the estimated time of arrival specified in c) 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.

Note 2. — See also 5.1.2.

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 ATS unit to give priority to the aircraft and to minimize conflict with other aircraft.

Note 1. — Responsibility of ATS units in situations of unlawful interference is contained in Annex 11.

Note 2. — Guidance material for use when unlawful interference occurs and the aircraft is unable to notify an ATS unit of this fact is contained in Attachment A to this CAR.

Note 3.— Action to be taken by SSR-, ADS-B-, and ADS-C-equipped aircraft which are being subjected to unlawful interference is contained in Annex 11, the PANS-RAC (Doc 4444) and the PANS-OPS (Doc 8168).

Note 4. — Action to be taken by CPDLC-equipped aircraft which are being subjected to unlawful interference is contained in Annex 11, the PANS-RAC (Doc 4444), and guidance material on the subject is contained in the Manual of Air Traffic Services Data Link Applications (Doc 9694).

Note 5. — AIP (India) ENR 1.13 contains the General Rules and Procedures for Unlawful Interference.

- 3.7.2 If an aircraft is subjected to unlawful interference, the pilot-in-command shall attempt to land as soon as practicable at the nearest suitable aerodrome or at a dedicated aerodrome assigned by the appropriate authority unless considerations aboard the aircraft dictate otherwise.

Note 1. — Requirements for State authorities with respect to aircraft on the ground that are subject to unlawful interference are contained in Annex 17, Chapter 5, 5.2.4.

Note 2. — See 2.4 regarding the authority of the pilot-in-command of an aircraft.

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

3.8.1 Interception of civil aircraft shall be governed by appropriate regulations and administrative directives issued by Contracting States in compliance with the Convention on International Civil Aviation, and in particular Article 3(d) of the Chicago Convention under which Contracting States undertake, when issuing regulations for their State aircraft, to have due regard for the safety of navigation of civil aircraft.

3.8.2 The pilot-in-command of a civil aircraft, when intercepted, shall comply with the Standards as contained in AIP (India) ENR 1.12, interpreting and responding to visual signals as specified in Appendix 1, Section 2.

Note 1. — See also 1.1 and 3.4.

Note 2. — AIP (India) ENR 1.12 contains the General Rules and Procedures for Interception of Civil Aircraft – Identification and Interception procedures.

3.9 VMC visibility and distance from cloud minima

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

Table 3-1* (see 4.1)

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	8Km	1 500 m 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	5Km	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	5Km	1 500 m horizontally 300 m (1 000 ft) vertically
	F G	5Km**	Clear of cloud and with the surface in sight.

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

** When so prescribed by the appropriate ATS authority:

a) flight visibilities reduced to not less than 3 000 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 upto 1 000 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.

***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.

4 VISUAL FLIGHT RULES

- 4.1 Except when operating as a special VFR flight, 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.
- 4.2 Except when a clearance is obtained from an air traffic control unit, 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.
- 4.3 VFR flights shall be operated during the period from 20 minutes before sunrise to 20 minutes after sunset.
- 4.4 Unless authorized by the appropriate ATS authority, VFR flights shall not be operated:
 - a) above FL150.
 - b) at transonic and 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 (1000 ft) is applied above FL 290.
- 4.6 Except when necessary for take-off or landing, or except by permission from the Director General, 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 (1000 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.

Note. — See also 3.1.2.

- 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 (3000 ft) from the ground or water, or a higher datum as specified by the appropriate ATS authority, shall be conducted at a cruising level appropriate to the track as specified in the Tables of cruising levels contained in Appendix 3 and AIP Supplement 25 of 2003.

4.8 VFR flights shall comply with the provisions of 3.6:

- a) when operated within Class 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 the 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.

Note. — See Notes following 3.6.5.1.

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.

5. INSTRUMENT FLIGHT RULES

5.1 Rules applicable to all IFR flights

5.1.1 Aircraft equipment

Aircraft shall be 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 by the Director General, 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 (2000 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 300m (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.

Note 2. — See also 3.1.2.

5.1.3 Change from IFR flight to VFR flight

5.1.3.1 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 an aircraft operating under the instrument flight rules is flown in or encounters visual meteorological conditions it 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 operated 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 Tables 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,

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

An IFR flight operating in level cruising flight outside of controlled airspace shall be flown at a cruising level appropriate to its track as specified in:

- a) the Tables of cruising levels in Appendix 3, except when otherwise specified by the appropriate ATS authority 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

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.

Note.— See Notes following 3.6.5.1.

5.3.3 Position reports

An IFR flight operating outside controlled airspace and 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,

shall report position as specified in 3.6.3 for controlled flights.

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.



(B. S. Bhullar)
Director General of Civil Aviation

SIGNALS

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 Annex 10, Volume II, Chapter 5.

Note 3. — For details of the search and rescue visual signals, see Annex 12.

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 signalling 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 may be transmitted by hand but its transmission by means of an automatic instrument is recommended.

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	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. <i>Note 1. — Meteorological conditions or terrain may require the intercepting aircraft to reverse the positions and direction of turn given above in Series 1.</i> <i>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 patterns and to rock the aircraft each time it passes the intercepted aircraft.</i>	You have been intercepted. Follow me.	DAY or NIGHT — Rocking aircraft, flashing navigational lights at irregular intervals and following. <i>Note. — Additional action required to be taken by intercepted aircraft is prescribed in Chapter 3, 3.8.</i>	Understood, will comply.
2	DAY or NIGHT — An abrupt break-away 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.	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, proceeding to land.	Understood, will comply.

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 OR ABOUT TO ENTER A RESTRICTED, PROHIBITED OR DANGER AREA

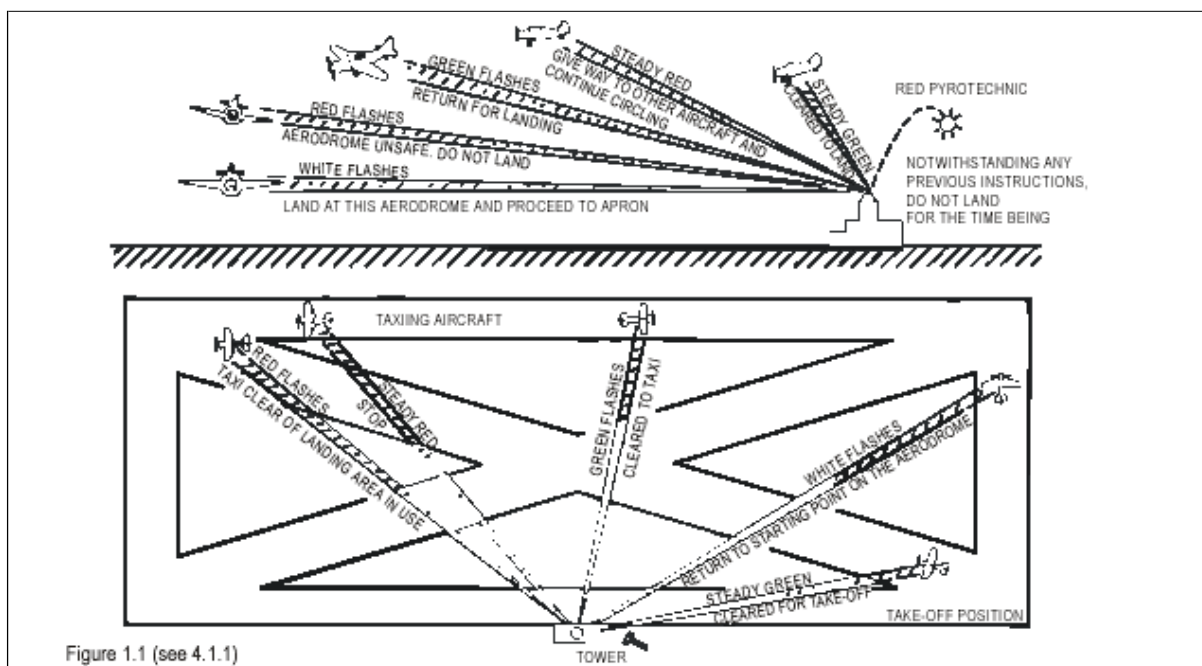
By day and by night, a series of projectiles discharged from the ground at intervals of 10 seconds, each showing, on bursting, red and green lights or stars will indicate to an unauthorized aircraft that it is flying in or about to enter a restricted, prohibited or danger area, and that the aircraft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

Light		From Aerodrome Control to:	
		Aircraft in flight	Aircraft on the ground
Directed towards aircraft concerned (see figure 1.1)	Steady green	Cleared to land	Cleared for take-off
	Steady red	Give way to other aircraft and continue circling	Stop
	Series of green flashes	Return for landing*	Cleared to taxi
	Series of red flashes	Aerodrome unsafe, do not land	Taxi clear of landing area in use
	Series of white flashes	Land at this aerodrome and proceed to apron*	Return to starting point on the aerodrome
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.			



4.1.2 Acknowledgement by an aircraft

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

Note. — This signal should 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 Annex 14.

4.2.1 Prohibition of landing

A horizontal red square panel with yellow diagonals (Figure 1.2) when displayed in a signal area indicates that landings are prohibited and that the prohibition is liable to be prolonged.



Fig 1.2

4.2.2 Need for special precautions while approaching or landing

A horizontal red square panel with one yellow diagonal (Figure 1.3) 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.



Fig 1.3

4.2.3 Use of runways and taxiways

- 4.2.3.1 A horizontal white dumb-bell (Figure 1.4) when displayed in a signal area indicates that aircraft are required to land, take off and taxi on runways and taxiways only.



Fig 1.4

- 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 1.5) 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.



Fig 1.5

4.2.4 Closed runways or taxiways

Crosses of a single contrasting colour, yellow or white (Figure 1.6), displayed horizontally on runways and taxiways or parts thereof indicate an area unfit for movement of aircraft.



On portion of runway



On portion of taxiway

Fig 1.6

4.2.5 Directions for landing or take-off

- 4.2.5.1 A horizontal white or orange landing T (Figure 1.7) 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 coloured lights.



Fig 1.7

- 4.2.5.2 A set of two digits (Figure 1.8) 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 1.8

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 1.9) indicates that turns are to be made to the right before landing and after take-off.

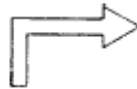


Figure 1.9

4.2.7 Air traffic services reporting office

The letter C displayed vertically in black against a yellow background (Figure 1.10) indicates the location of the air traffic services reporting office.



Fig 1.10

4.2.8 Glider flights in operation

A double white cross displayed horizontally (Figure 1.11) in the signal area indicates that the aerodrome is being used by gliders and that glider flights are being performed.



Fig 1.11

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 the 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 be also read to refer to daylight fluorescent-coloured 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.

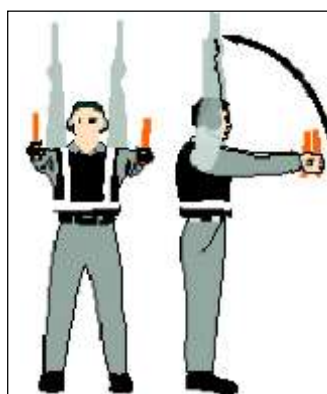
Note. — The design of many aircraft is such that the path of the wing tips, engines and other extremities cannot always be monitored visually from the flight deck while the aircraft is being manoeuvred on the ground.



1. Wingwalker/ guide

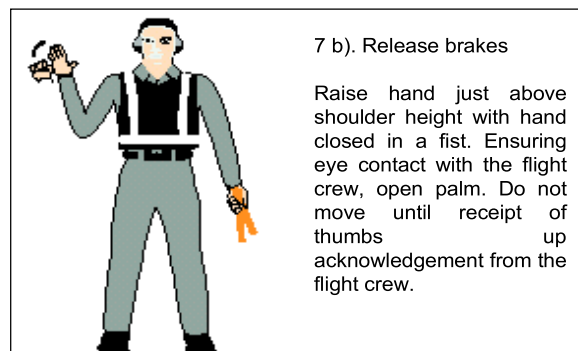
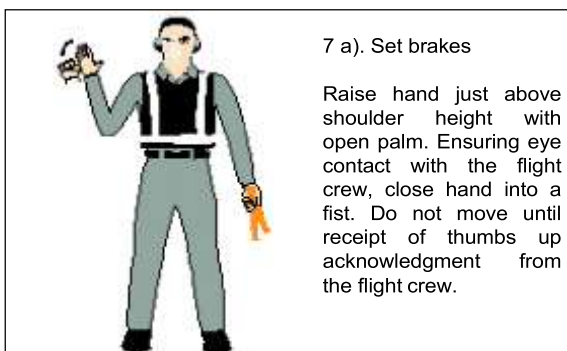
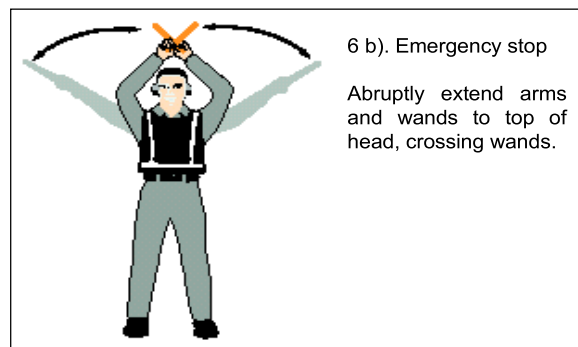
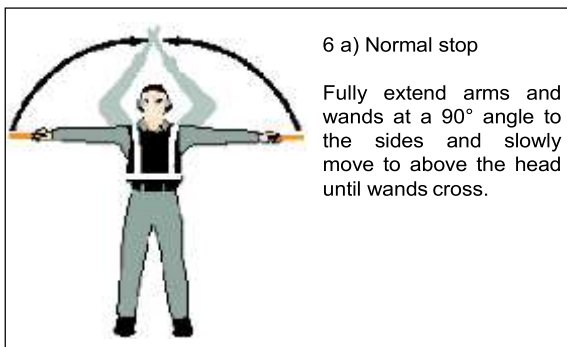
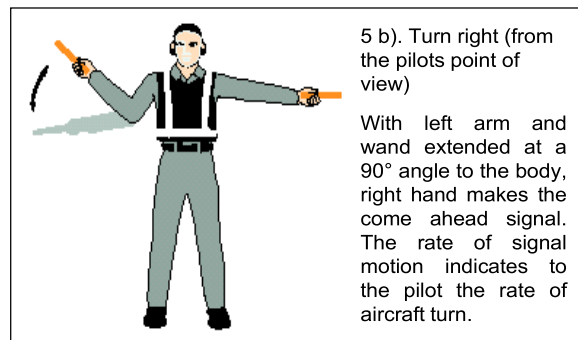
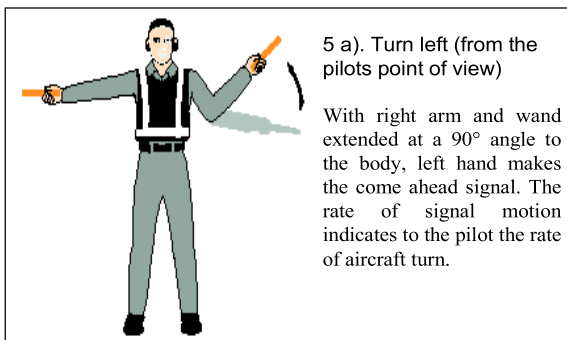
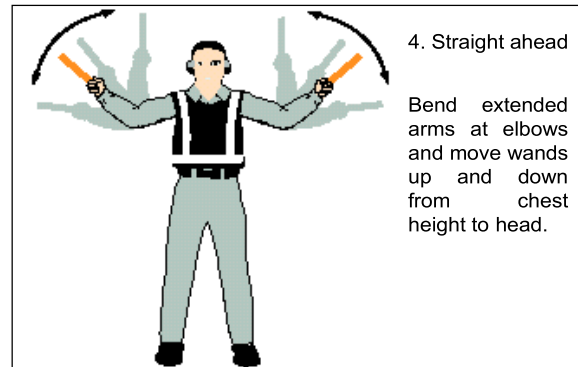
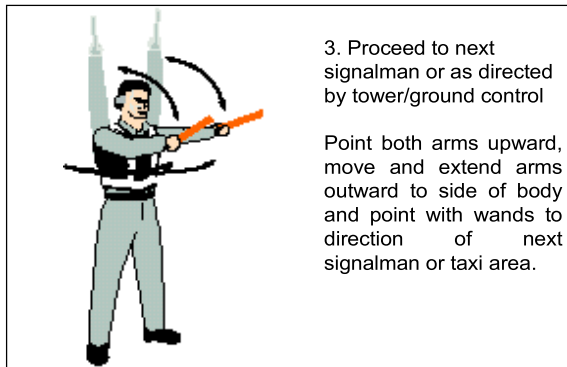
Raise right hand above head level with wand pointing up, move left hand wand pointing down toward the body.

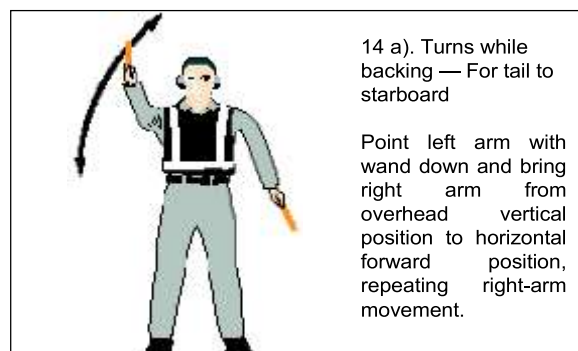
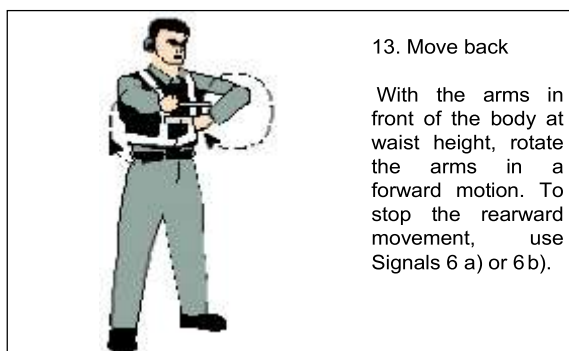
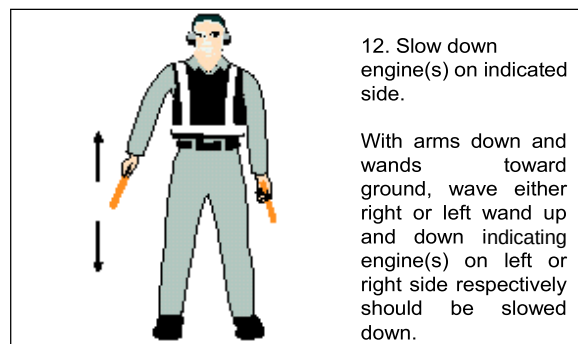
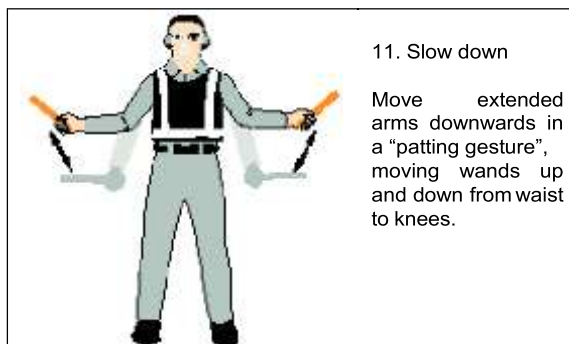
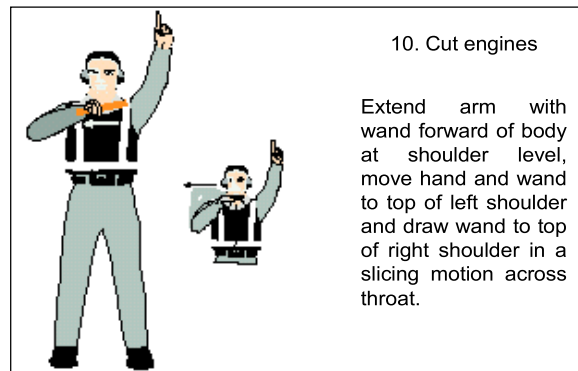
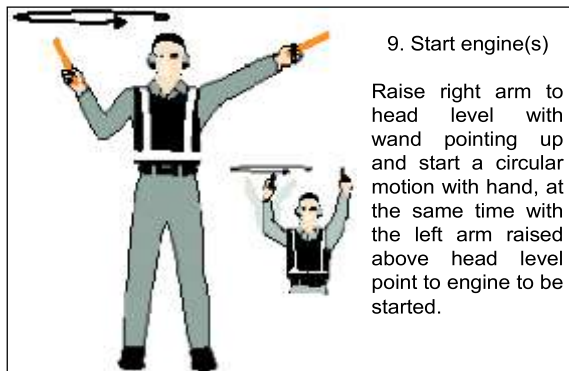
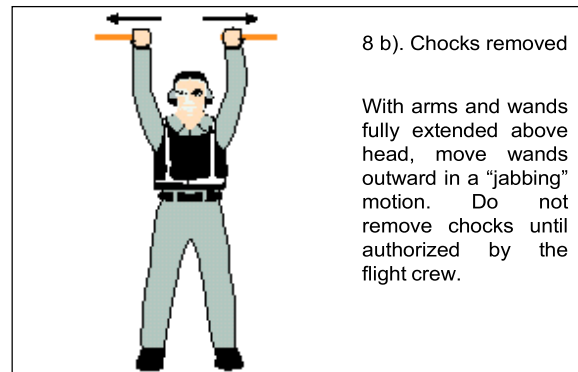
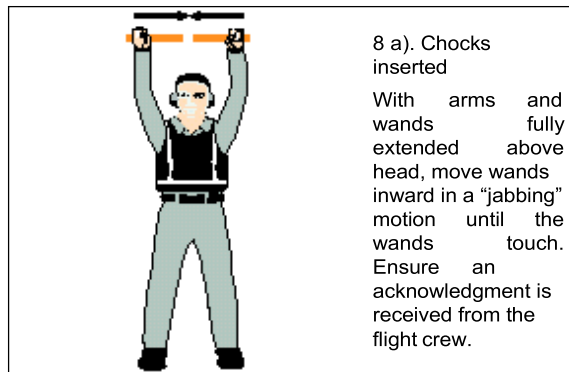
Note. — This signal provides an indication by a person positioned at the aircraft wingtip, to the pilot/ marshaller/ push-back operator, that the aircraft movement on/off a parking position would be unobstructed.

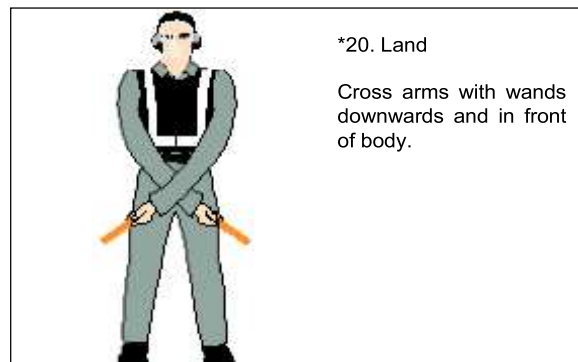
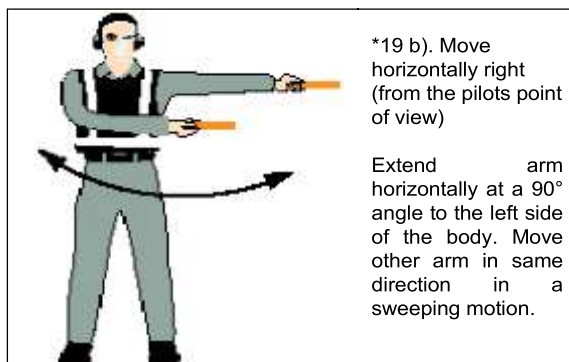
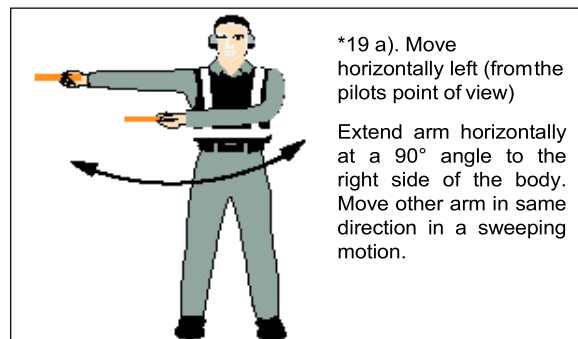
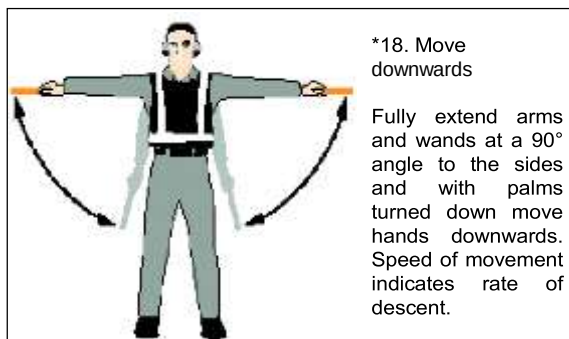
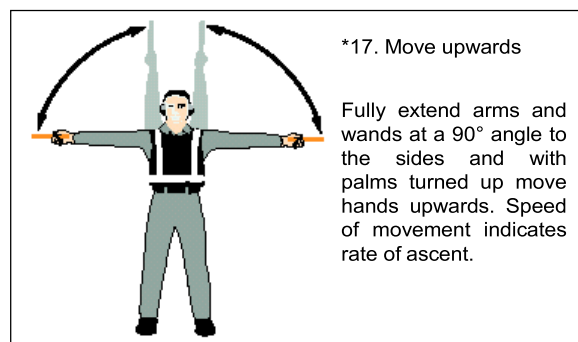
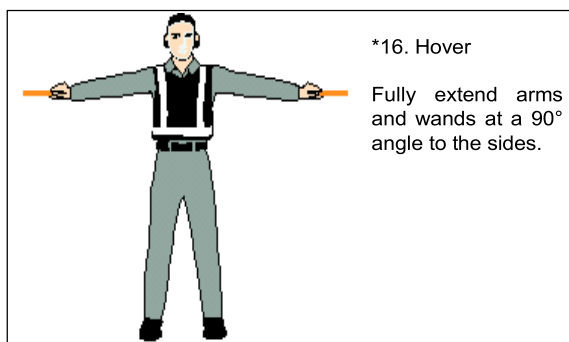
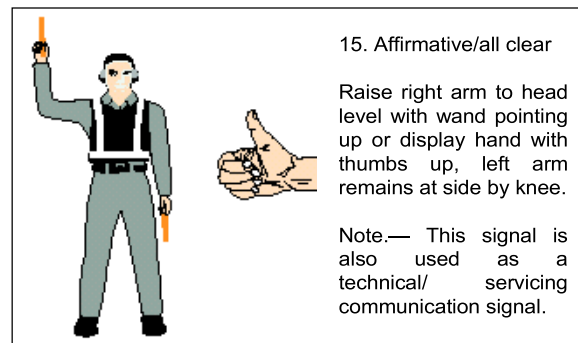
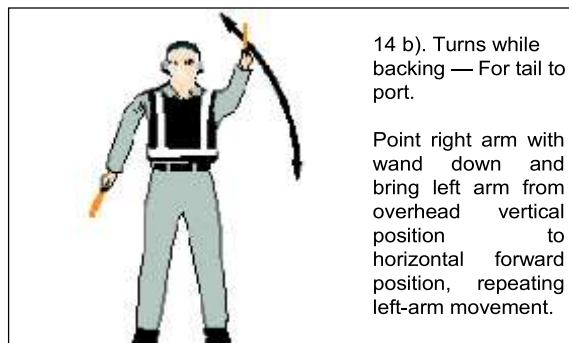


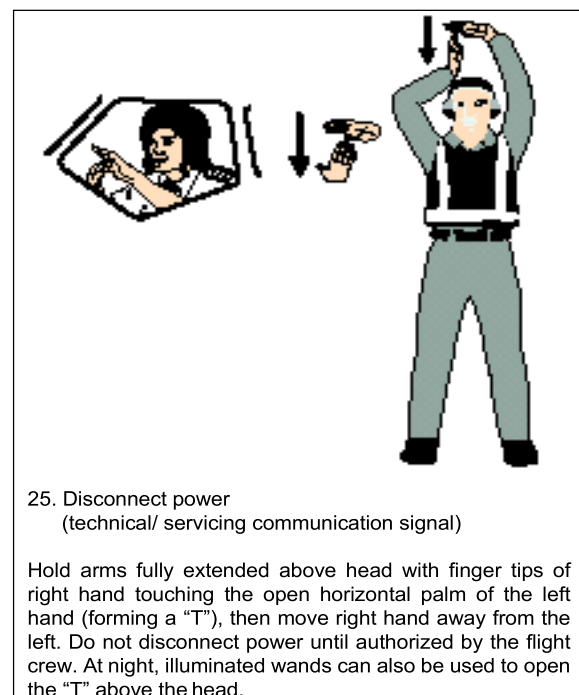
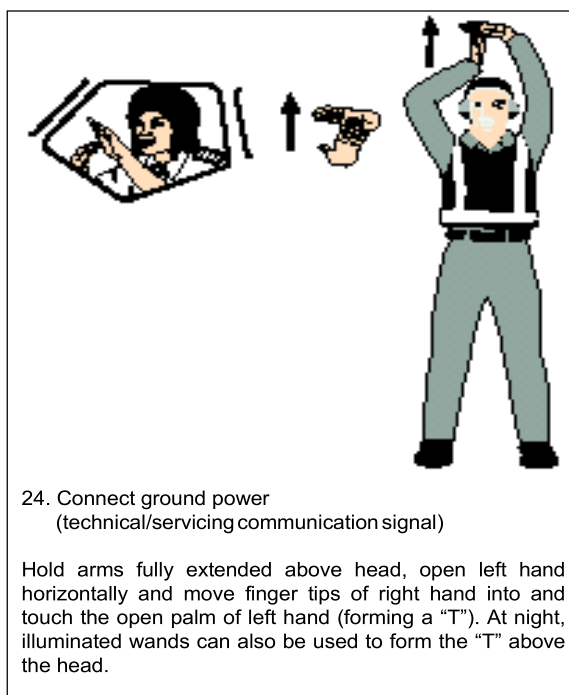
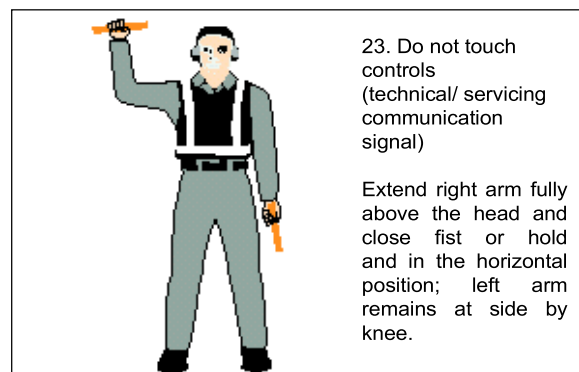
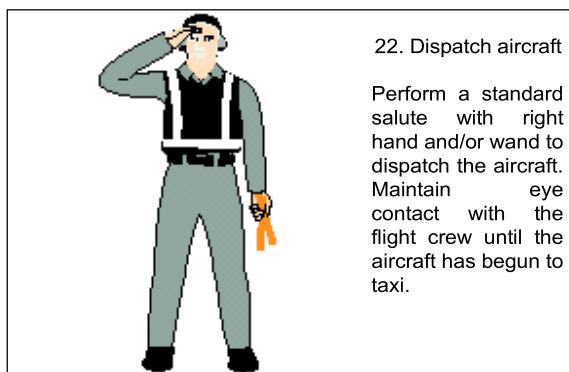
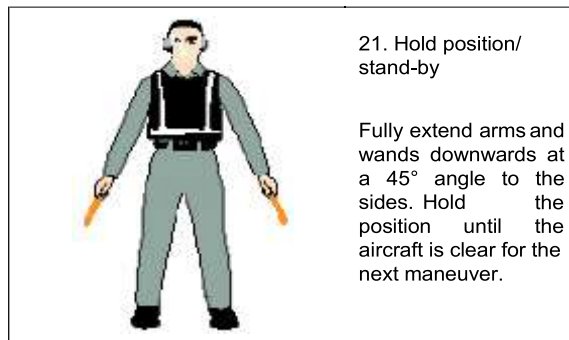
2. Identify gate

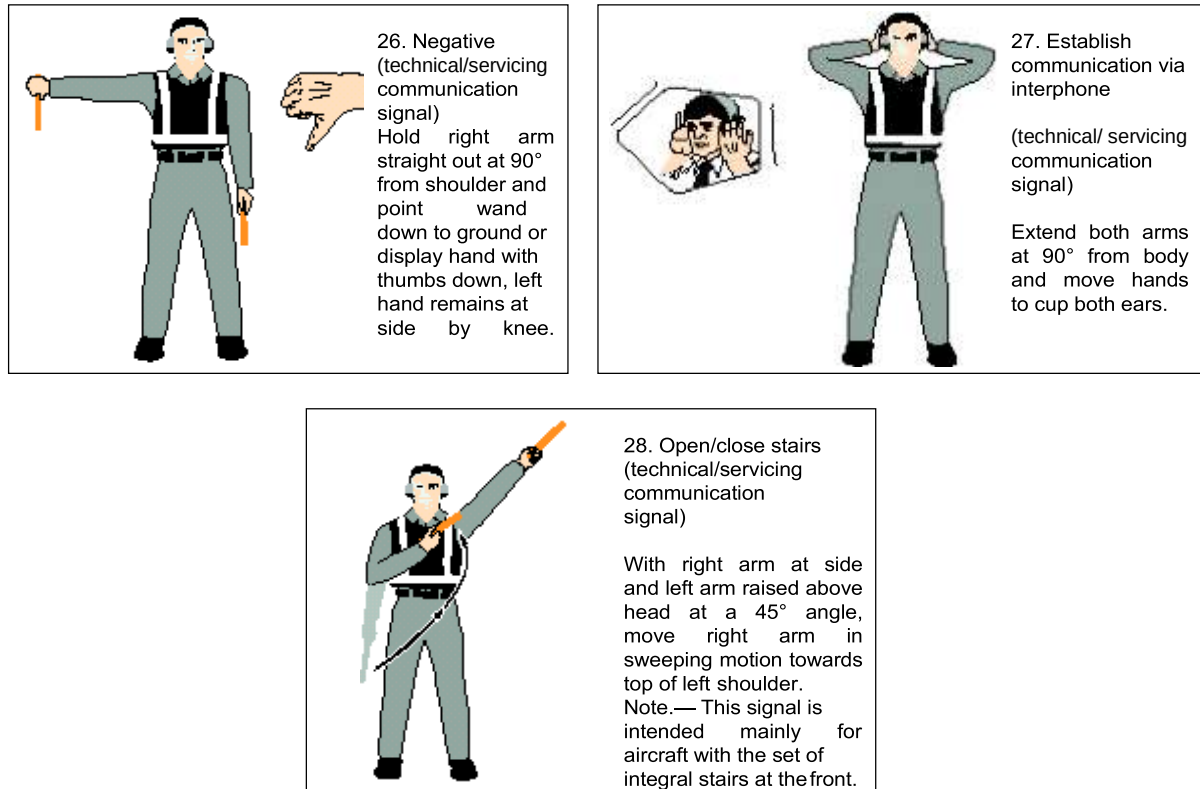
Raise fully extended arms straight above the head with wands pointing up.











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.

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

5.2.2 Chocks

- Insert chocks:* arms extended, palms outwards, move hands inwards to cross in front of face.
- 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 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 ARFF incident commander/ARFF firefighters and the cockpit and/or cabin crews of the incident aircraft. ARFF emergency hand signals should be given from the left front side of the aircraft for the cockpit 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 aircraft rescue and fire-fighting 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 the CAR)

1. Principles observed

1.1 To achieve the uniformity in regulations which is necessary for the safety of navigation of civil aircraft due regard shall be given to the following principles when developing procedures and administrative directives:

- a) interception of civil aircraft will be undertaken only as a last resort;
- b) if undertaken, an interception will 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;
- c) practice interception of civil aircraft will not be undertaken;
- d) navigational guidance and related information will be given to an intercepted aircraft by radiotelephony, whenever radio contact can be established; and
- e) in the case where an intercepted civil aircraft is required to land in the territory overflown, the aerodrome designated for the landing is to be suitable for the safe landing of the aircraft type concerned.

Note. — In the unanimous adoption by the 25th Session(Extraordinary) of the ICAO Assembly on 10 May 1984 of Article 3 bis to the Convention on International Civil Aviation, Contracting States have recognized that “every State must refrain from resorting to the use of weapons against civil aircraft in flight”.

1.2 A standard method shall be established for the manoeuvring of aircraft intercepting a civil aircraft. Such method shall be designed to avoid any hazard for the intercepted aircraft.

1.3 Provision shall be made for the use of secondary surveillance radar or ADS-B, where available, to identify civil aircraft in areas where they may be subject to interception.

2. Action by intercepted aircraft

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;
- 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.

3. 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.

APPENDIX 3

TABLE OF CRUISING LEVELS

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

RVSM – FEET

a) in areas where feet are used for altitude and where, in accordance with regional air navigation agreements, a vertical separation minimum of 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			VFR Flights			IFR Flights			VFR Flights		
Level			Level			Level			Level		
FL	Feet	Metres	FL	Feet	Metres	FL	Feet	Metres	FL	Feet	Metres
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 1 000 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 169 degrees and from 170 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

- b) 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			VFR Flights			IFR Flights			VFR Flights		
Level			Level			Level			Level		
Standard Metric	Metres	Feet	Standard Metric	Metres	Feet	Standard Metric	Metres	Feet	Standard Metric	Metres	Feet
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				1310	13 100	43 000			
1370	13 700	44 900				1430	14 300	46 900			
1490	14 900	48 900				1530	15 300	50 900			
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 1 000 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

c) 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			VFR Flights			IFR Flights			VFR Flights		
Level			Level			Level			Level		
FL	Feet	Metres	FL	Feet	Metres	FL	Feet	Metres	FL	Feet	Metres
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	420	42 000	12 800	430	43 000	13 100	440	44 000	13 400
450	45 000	13 700	460	46 000	14 000	470	47 000	14 350	480	48 000	14 650
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.	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 9374).

Non-RVSM – METRES

- d) 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			VFR Flights			IFR Flights			VFR Flights		
Level			Level			Level			Level		
Standard Metric	Metres	Feet	Standard Metric	Metres	Feet	Standard Metric	Metres	Feet	Standard Metric	Metres	Feet
0030	300	1 000	—	—	—	0060	600	2 000	—	—	—
0090	900	3 000	0105	1 050	3 500	0120	1200	3 900	0135	1 350	4 400
0150	1 500	4 900	0165	1 650	5 400	0180	1800	5 900	0195	1 950	6 400
0210	2 100	6 900	0225	2 250	7 400	0240	2400	7 900	0255	2 550	8 400
0270	2 700	8 900	0285	2 850	9 400	0300	3000	9 800	0315	3 150	10 300
0330	3 300	10 800	0345	3 450	11 300	0360	3600	11 800	0375	3 750	12 300
0390	3 900	12 800	0405	4 050	13 300	0420	4200	13 800	0435	4 350	14 300
0450	4 500	14 800	0465	4 650	15 300	0480	4800	15 700	0495	4 950	16 200
0510	5 100	16 700	0525	5 250	17 200	0540	5400	17 700	0555	5 550	18 200
0570	5 700	18 700	0585	5 850	19 200	0600	6000	19 700	0615	6 150	20 200
0630	6 300	20 700	0645	6 450	21 200	0660	6600	21 700	0675	6 750	22 100
0690	6 900	22 600	0705	7 050	23 100	0720	7200	23 600	0735	7 350	24 100
0750	7 500	24 600	0765	7 650	25 100	0780	7800	25 600	0795	7 950	26 100
0810	8 100	26 600	0825	8 250	27 100	0840	8400	27 600	0855	8 550	28 100
0890	8 900	29 100	0920	9 200	30 100	0950	9500	31 100	0980	9 800	32 100
1010	10 100	33 100	1040	10 400	34 100	1070	10700	35 100	1100	11 000	36 100
1130	11 300	37 100	1160	11 600	38 100	1190	11900	39 100	1220	12 200	40 100
1250	12 500	41 100	1280	12 800	42 100	1310	13100	43 000	1370	13 400	44 000
1370	13 700	44 900	1400	14 000	46 100	1430	14300	46 900	1460	14 600	47 900
1490	14 900	48 900	1520	15 200	49 900	1550	15500	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).

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APPENDIX 5

UNMANNED FREE BALLOONS
(Note. — See Para 3.1.10 of the CAR)

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 centimetre; 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 4.1.

2. General operating rules

- 2.1 An unmanned free balloon shall not be operated without appropriate authorization from the State from which 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 the appropriate authority, 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 the State of Registry and the State(s) expected to be overflown.

- 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 co-ordination 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 tele-command, 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.

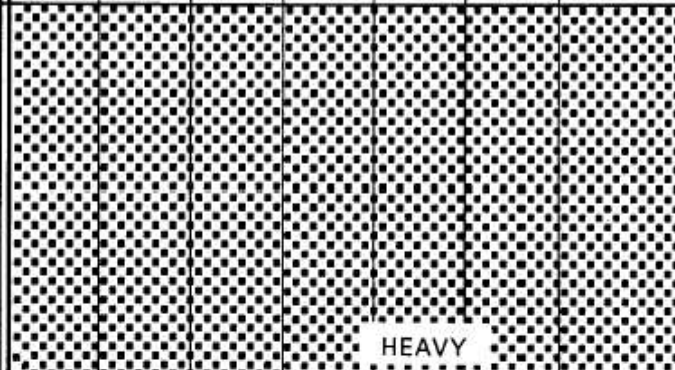
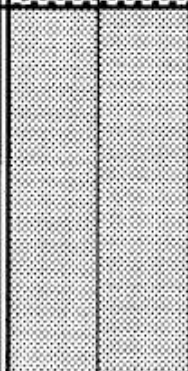
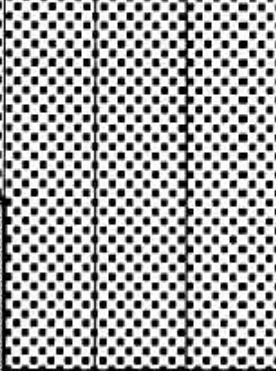
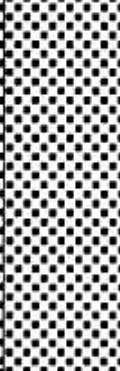
CHARACTERISTICS		PAYLOAD MASS (kilogrammes)					
		1	2	3	4	5	6 or more
ROPE or OTHER SUSPENSION 230 Newtons or MORE							
INDIVIDUAL PAYLOAD PACKAGE	AREA DENSITY more than 13 g/cm ²						
AREA DENSITY CALCULATION <math display="block">\frac{\text{MASS (g)}}{\text{Area of smallest surface (cm}^2\text{)}}</math>	AREA DENSITY less than 13 g/cm ²						
COMBINED MASS (if Suspension OR Area density OR Mass of individual package are not factors)							

Figure 4.1 Classification of unmanned free balloons

APPENDIX 6

LIGHTS TO BE DISPLAYED BY AEROPLANE

(Note. — See Para 3.2.3 and 3.2.6.2)

LIGHTS TO BE DISPLAYED BY AEROPLANES

1. Terminology

When the following terms are used in this Appendix, they have the following meanings:

Angles of coverage.

- a) Angle of coverage A is formed by two intersecting vertical planes making angles of 70 degrees to the right and 70 degrees to the left respectively, looking aft along the longitudinal axis to a vertical plane passing through the longitudinal axis.
- b) Angle of coverage F is formed by two intersecting vertical planes making angles of 110 degrees to the right and 110 degrees to the left respectively, looking forward along the longitudinal axis to a vertical plane passing through the longitudinal axis.
- c) Angle of coverage L is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aeroplane, and the other 110 degrees to the left of the first, when looking forward along the longitudinal axis.
- d) Angle of coverage R is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aeroplane, and the other 110 degrees to the right of the first, when looking forward along the longitudinal axis.

Horizontal plane. The plane containing the longitudinal axis and perpendicular to the plane of symmetry of the aeroplane.

Longitudinal axis of the aeroplane. A selected axis parallel to the direction of flight at a normal cruising speed, and passing through the centre of gravity of the aeroplane.

Making way. An aeroplane on the surface of the water is “making way” when it is under way and has a velocity relative to the water.

Under command. An aeroplane on the surface of the water is “under command” when it is able to execute manoeuvres as required by the International Regulations for Preventing Collisions at Sea for the purpose of avoiding other vessels.

Under way. An aeroplane on the surface of the water is “under way” when it is not aground or moored to the ground or to any fixed object on the land or in the water.

Vertical planes. Planes perpendicular to the horizontal plane.

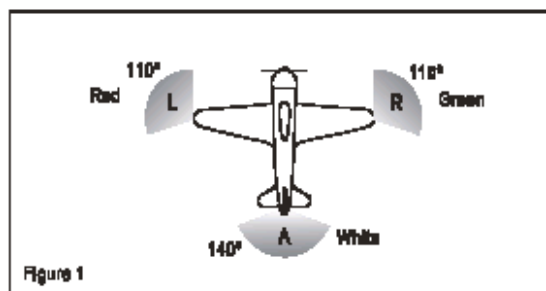
Visible. Visible on a dark night with a clear atmosphere.

2. Navigation lights to be displayed in the air

Note. — The lights specified herein are intended to meet the requirements of Annex 2 for navigation lights.

As illustrated in Figure 1, the following unobstructed navigation lights shall be displayed:

- a) a red light projected above and below the horizontal plane through angle of coverage L;
- b) a green light projected above and below the horizontal plane through angle of coverage R;
- c) a white light projected above and below the horizontal plane rearward through angle of coverage A.



3. Lights to be displayed on the water

3.1 General

Note.— The lights specified herein are intended to meet the requirements of Annex 2 for lights to be displayed by aeroplanes on the water.

The International Regulations for Preventing Collisions at Sea require different lights to be displayed in each of the following circumstances:

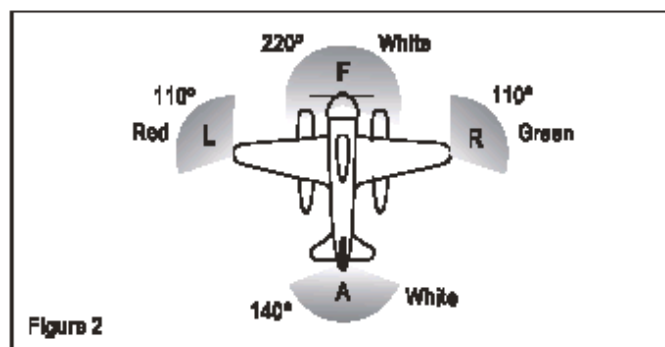
- a) when under way;
- b) when towing another vessel or aeroplane;
- c) when being towed;
- d) when not under command and not making way;
- e) when making way but not under command;
- f) when at anchor;
- g) when aground.

The lights required by aeroplanes in each case are described below.

3.2 When under way

As illustrated in Figure 2, the following appearing as steady unobstructed lights:

- a) a red light projected above and below the horizontal through angle of coverage L;
- b) a green light projected above and below the horizontal through angle of coverage R;
- c) a white light projected above and below the horizontal through angle of coverage A; and
- d) a white light projected through angle of coverage F.

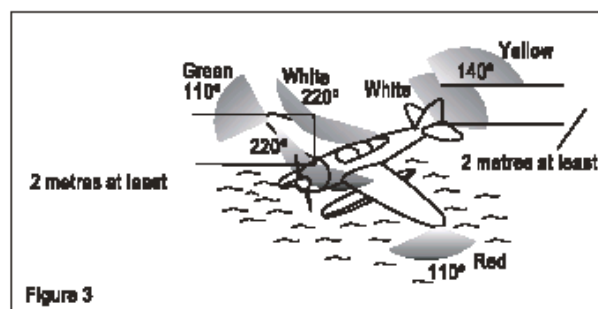


The lights described in 3.2 a), b) and c) should be visible at a distance of at least 3.7 km (2 NM). The light described in 3.2 d) should be visible at a distance of 9.3 km (5 NM) when fitted to an aeroplane of 20 m or more in length or visible at a distance of 5.6 km (3 NM) when fitted to an aeroplane of less than 20 m in length.

3.3 When towing another vessel or aeroplane

As illustrated in Figure 3, the following appearing as steady, unobstructed lights:

- a) the lights described in 3.2;
- b) a second light having the same characteristics as the light described in 3.2 d) and mounted in a vertical line at least 2 m above or below it; and
- c) a yellow light having otherwise the same characteristics as the light described in 3.2 c) and mounted in a vertical line at least 2 m above it.

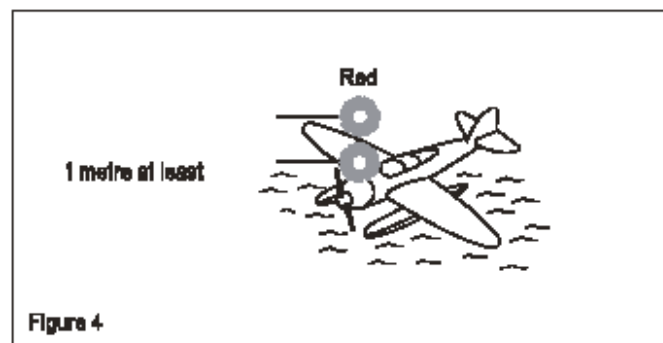


3.4 When being towed

The lights described in 3.2 a), b) and c) appearing as steady, unobstructed lights.

3.5 When not under command and not making way

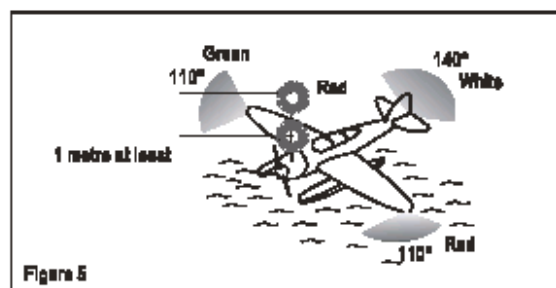
As illustrated in Figure 4, two steady red lights placed where they can best be seen, one vertically over the other and not less than 1 m apart, and of such a character as to be visible all around the horizon at a distance of at least 3.7 km (2 NM).



3.6 When making way but not under command

As illustrated in Figure 5, the lights described in 3.5 plus the lights described in 3.2 a), b) and c).

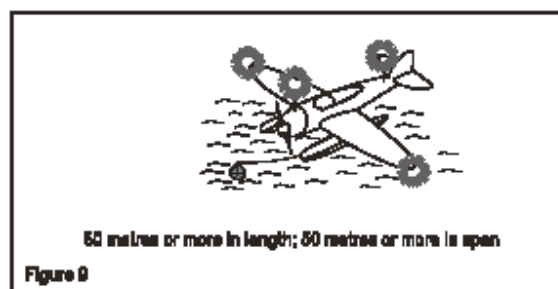
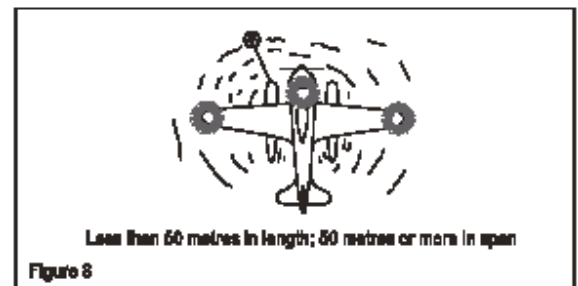
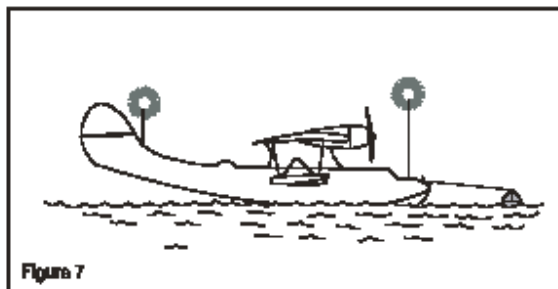
Note — The display of lights prescribed in 3.5 and 3.6 is to be taken by other aircraft as signals that the aeroplane showing them is not under command and cannot therefore get out of the way. They are not signals of aeroplanes in distress and requiring assistance.



3.7 When at anchor

- a) If less than 50 m in length, where it can best be seen, a steady white light (Figure 6), visible all around the horizon at a distance of at least 3.7 km (2 NM).

- b) If 50 m or more in length, where they can best be seen, a steady white forward light and a steady white rear light (Figure 7) both visible all around the horizon at a distance of at least 5.6 km (3 NM).
- c) If 50 m or more in span a steady white light on each side (Figures 8 and 9) to indicate the maximum span and visible, so far as practicable, all around the horizon at a distance of at least 1.9 km (1 NM).



3.8 When aground

The lights prescribed in 3.7 and in addition two steady red lights in vertical line, at least 1 m apart so placed as to be visible all around the horizon.

ATTACHMENT A

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 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 no 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.

Note. — Action to be taken by an aircraft which is intercepted while being subject to an act of unlawful interference is prescribed in 3.8 of this CAR.

— END —