



MANUAL OF STANDARDS -

AIR TRAFFIC MANAGEMENT

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FOREWORD

The Communication Navigation Surveillance (CNS) and Aerodrome Services Regulation Division of the Civil Aviation Authority of Liberia is responsible for the safety regulation of air navigation and aerodromes services in Liberia, including licensing of air traffic controllers and approval of training organizations for air traffic controllers. The Communication Navigation Surveillance (CNS) and Aerodrome Services Regulation Division are also responsible for developing and promulgating appropriate, clear and concise aviation safety standards.

The Manual of Standards – Air Traffic Management (MOS-ATM) contains the standards requirements and procedures pertaining to the provision of air navigation services. The standards and requirements in this Manual are based mainly on standards and recommended practices stipulated in Annex 11 (entitled “Air Traffic Services”) to the Chicago Convention on International Civil Aviation (as enforce and amended from time to time by the Council of the International Civil Aviation Organization) and in the procedure for air navigation services – air traffic management, and with such modifications as may be determined by the Communication Navigation Surveillance (CNS) and Aerodrome Services Regulation Division to be applied in Liberia.

From time to time, the Communication Navigation Surveillance (CNS) and Aerodrome Services Regulation Division may wish to supplement the standards and requirements in this Manual in the form of Safety Directives, Safety Publications or Information Circulars. Where appropriate, such directives or circulars will be incorporated into this Manual by amendment.

Amendments to this Manual of Standards – Air Traffic Management are the responsibility of the Air Traffic Management Department Head. Reader should forward advice of errors, inconsistencies or suggestions for improvement to this Manual to the addressed stipulated below.

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CHAPTER 1 DEFINITIONS AND ABBREVIATIONS

1.1 Introduction

1.1.1 The terms used in this document, and defined below, are those used to describe facilities, services and procedures for air traffic and related services. As far as possible, the terms used in this document, and defined below, are those which have the widest international use.

1.2 Air Traffic Services Terms

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

A

ACCEPTING UNIT An air traffic control unit next to take control of an aircraft.

ACCIDENT An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which:

a) a person is fatally or seriously injured as a result of:

- being in the aircraft, or
- direct contact with any part of the aircraft, including Parts which have become detached from the aircraft,

or

- direct exposure to jet blast,

except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

b) the aircraft sustains damage or structural failure which:

- adversely affects the structural strength, performance or flight characteristics of the aircraft, and
- would normally require major repair or replacement of the affected component,

except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tires, brakes, fairings, small dents or puncture holes in the aircraft skin; or

c) the aircraft is missing or is completely inaccessible.

Note 1.— For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified as a fatal injury by ICAO.

Note 2.— An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.

ACCURACY A degree of conformance between the estimated or measured value and the true value.

Note.— For measured positional data the accuracy is normally expressed in terms of a distance from a stated position within which there is a defined confidence of the true position falling.

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.

Note.— The term “aerodrome” where used in the provisions relating to flight plans and ATS messages is intended to cover also sites other than aerodromes which may be used by certain types of aircraft, e.g. helicopters or balloons.

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 ELEVATION The elevation of the highest point of the landing area.

AERODROME TRAFFIC All traffic on the manoeuvring 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 CIRCUIT The specified path to be flown by aircraft operating in the vicinity of an aerodrome.

- AERONAUTICAL FIXED SERVICE (AFS)** A telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services.
- AERONAUTICAL FIXED STATION** A station in the aeronautical fixed service.
- AERONAUTICAL GROUND LIGHT** Any light specially provided as an aid to air navigation, other than a light displayed on an aircraft.
- 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 MOBILE SERVICE** A mobile service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may participate; emergency position-indicating radio beacon stations may also participate in this service on designated distress and emergency frequencies.
- AERONAUTICAL STATION** A land station in the aeronautical mobile service. In certain instances, an aeronautical station may be located, for example, on boardship or on a platform at sea.
- AERONAUTICAL TELECOMMUNICATION STATION** A station in the aeronautical telecommunication service.

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 that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

AIRCRAFT ADDRESS A unique combination of 24 bits available for assignment to an aircraft for the purpose of air-ground communications, navigation and surveillance.

AIRCRAFT IDENTIFICATION A group of letters, figures or a combination thereof which is either identical to, or the coded equivalent of, the aircraft callsign to be used in air-ground communications, and which is used to identify the aircraft in ground - ground air traffic services communications.

AIRCRAFT OBSERVATION The evaluation of one or more meteorological elements made from an aircraft in flight

AIRCRAFT PROXIMITY A situation in which, in the opinion of a pilot or air traffic services personnel, the distance between aircraft as well as their relative positions and speed have been such that the safety of the aircraft involved may have been compromised. An aircraft proximity is classified as follows:

Risk of collision: The risk classification of an aircraft proximity in which serious risk of collision has existed.

Safety not assured: The risk classification of an aircraft proximity in which the safety of the aircraft may have been compromised.

No risk of collision: The risk classification of an aircraft proximity in which no risk of collision has existed.

Risk not determined: The risk classification of an aircraft proximity in which insufficient information was available to determine the risk involved, or inconclusive or conflicting evidence precluded such determination.

AIR-GROUND COMMUNICATION Two way communication between aircraft and stations or locations on the surface of the earth.

AIRPROX The code word used in an air traffic incident report to designate aircraft proximity.

AIR-REPORT A report from an aircraft in flight prepared in conformity with requirements for position, and operational and/or meteorological reporting.

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

Note.— The actual height may vary, and some helicopters may require air-taxiing above 8 m (25 ft) AGL to reduce ground effect turbulence or provide clearance for cargo sling loads.

AIR TRAFFIC All traffic in flight, or operating on the manoeuvring area of an aerodrome.

AIR TRAFFIC CONTROL CLEARANCE Authorisation for an aircraft to proceed under conditions specified by an air traffic 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 INSTRUCTION Directives issued by air traffic control for the purpose of requiring the pilot to take specific action.

AIR TRAFFIC CONTROL SERVICE A service provided for the purpose of:

- a) preventing collisions:
 - 1) between aircraft, and
 - 2) on the manoeuvring 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 FLOW MANAGEMENT (ATFM) A service established with the objective of contributing to a safe, orderly and expeditious flow of air traffic by ensuring that ATC capacity is utilized to the maximum extent possible, and that the traffic volume is compatible with the capacities declared by the appropriate ATS authority.

AIR TRAFFIC MANAGEMENT The aggregation of the airborne functions and ground based functions (air traffic services, airspace management and air traffic flow management) required to ensure the safe and efficient movement of aircraft during all phases of operations.

AIR TRAFFIC MANAGEMENT SYSTEM A system that provides ATM through the collaborative integration of humans, information, technology, facilities and services, supported by air and ground and/ or space-based communications, navigation and surveillance.

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

AIR TRAFFIC SERVICES (ATS) AIRSPACE 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 as Class A to G as shown in Annex 11, Appendix 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.

ALERFA The code word used to designate the alert phase

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

ALERT PHASE A situation wherein apprehension exists as to the safety of an aircraft and its occupants.

ALLOCATION, ALLOCATE Distribution of frequencies, SSR Codes, etc. to a State, unit or service. Distribution of 24-bit aircraft addresses to a State or common mark registering authority

ALPHANUMERIC CHARACTERS A collective term for letters and figures (digits).

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 aerodrome includes 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.

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.

APPROACH SEQUENCE The order in which two or more aircraft are cleared for an approach to land at the aerodrome.

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 over flown.

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.

APRON MANAGEMENT SERVICE A service provided to regulate the activities and movement of aircraft and vehicles on an apron.

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 permits aircraft operation on any desired flight path within the coverage of station referenced navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

AREA NAVIGATION ROUTE An ATS route established for the use of aircraft capable of employing area navigation.

ASSIGNMENT, ASSIGN Distribution of frequencies to stations. Distribution of SSR Codes or 24-bit aircraft addresses to aircraft.

ATIS The symbol used to designate automatic terminal information service.

ATS ROUTE A specified route designed for channelling 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 (waypoints), distance between significant points, reporting requirements and, as determined by the ANSP, the lowest safe altitude.

ATS SURVEILLANCE SERVICE A term used to indicate a service provided directly by means of an ATS surveillance system.

ATS SURVEILLANCE SYSTEM A generic term meaning variously, ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft.

Note.— A comparable ground-based system is one that has been demonstrated, by comparative assessment or other methodology, to have a level of safety and performance equal to or better than mono pulse SSR.

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.

AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS) The automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof:

Data link-automatic terminal information service (DATIS). The provision of ATIS via data link.

Voice-automatic terminal information service (Voice- ATIS). The provision of ATIS by means of continuous and repetitive voice broadcasts.

B

BASE TURN A turn executed by the aircraft during the initial approach between the end of the outbound track and the beginning of the intermediate or final approach track. The tracks are not reciprocal.

Note. – Base turns may be designated as being made either in level flight or while descending, according to the circumstances of each individual procedure.

BLIND TRANSMISSION A transmission from one station to another station in circumstances where two-way communication cannot be established but where it is believed that the called station is able to receive the transmission.

BROADCAST A transmission of information relating to air navigation that is not addressed to a specific station or stations.

C

CEILING The height above the ground or water of the base of the lowest layer of cloud below 6000 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 Omni-directional radio ranges is expected to transfer its primary navigational reference from the facility behind the aircraft to the next facility ahead of the aircraft.

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.

CRUISING LEVEL A level maintained during a significant portion of a flight.

CURRENT DATA AUTHORITY The designated ground system through which a CPDLC dialogue between a pilot and a controller currently responsible for the flight is permitted to take place.

CURRENT FLIGHT PLAN (CPL) The flight plan, including changes, if any, brought about by subsequent clearances.

Note. – When the word “message” is used as a suffix to this term, it denotes the content and format of the current flight plan data sent from one unit to another.

D

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

DATA CONVENTION An agreed set of rules governing the manner or sequence in which a set of data may be combined into a meaningful communication.

DATA LINK COMMUNICATIONS A form of communication intended for the exchange of messages via a data link.

DATA LINK INITIATION CAPABILITY (DLIC) A data link application that provides the ability to exchange addresses, names and version numbers necessary to initiate data link applications.

DATA PROCESSING A systematic sequence of operations performed on data.

Note. – *Examples of operations are the merging, sorting, computing or any other transformation or rearrangement with the object of extracting or revising information, or of altering the representation of information.*

DATA QUALITY A degree or level of confidence that the data provided meets the requirements of the data user in terms of accuracy, resolution and integrity.

DATUM Any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities.

DECISION ALTITUDE (DA) or DECISION HEIGHT (DH) A specified altitude, or height, in the precision approach or approach with vertical guidance at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

Note 1. — *Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation.*

Note 2. — *The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path.*

Note 3—For convenience where both expressions are used they may be written in the form “decision altitude/height” and abbreviated “DA/H”.

DECLARED CAPACITY A measure of the ability of the ATC system or any of its subsystems or operating positions to provide service to aircraft during normal activities. It is expressed as the number of aircraft entering a specified portion of airspace in a given period of time, taking due account of weather, ATC unit configuration, staff and equipment available, and any other factors that may affect the workload of the controller responsible for the airspace.

DETRESFA The code word used to designate a distress phase.

DISCRETE CODE A four-digit SSR code with the last two digits not being "00".

DISTRESS PHASE A situation wherein there is reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance.

DME DISTANCE The line of sight distance (slant range) from the source of a DME signal to the receiving antenna.

DME SEPARATION Spacing of aircraft in terms of distance determined by reference to distance measuring equipment.

E

ELEVATION The vertical distance of a point or a level, on or affixed to the surface of the earth, measured from mean sea level.

EMERGENCY PHASE A generic term meaning, as the case may be uncertainty phase, alert phase or distress phase.

ESTIMATED ELAPSED TIME The estimated time required to proceed from one significant point to another.

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 point to complete its approach for a landing.

Note. – *The actual time of leaving the holding point will depend upon the approach clearance.*

EXPECTED ONWARD CLEARANCE TIME The time at which it is expected that an aircraft held enroute, will leave the holding point to continue on its flight.

F

FILED FLIGHT PLAN (FPL) The flight plan as filed with an ATS unit by the pilot or his designated representative, without any subsequent changes.

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

FINAL APPROACH That part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified,

- a) at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or
- b) at the point of interception of the last track specified in the approach procedure; and ends at a point in the vicinity of an aerodrome from which:
 - 1) a landing can be made; or
 - 2) a missed approach procedure is initiated.

FIX A geographical position determined by visual reference to the surface of the earth; by reference to one or more radio navigational aids; by celestial plotting, or by any other navigational device.

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 (FIR) 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 QFE altimeter setting, will indicate height above the QFE reference datum;*
- c) when set to a pressure of 1 013.2 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 PATH MONITORING The use of ATS surveillance systems for the purpose of providing aircraft with information and advice relative to significant deviations from nominal flight path, including deviations from terms of their air traffic control clearances.

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

Note. – Specifications for flight plans are contained in Annex 2.

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

FLOW CONTROL Measures designed to adjust the flow of traffic into a given airspace, along a given route, or bound for a given aerodrome, so as to ensure the most effective utilization of the airspace.

FORCED LANDING A landing performed not in accordance with the flight plan as a result of engine failure and/or malfunctioning.

FORECAST A statement of expected meteorological conditions for a specified time or period, and for a specified area or portion of airspace.

FORMATION FLIGHT A flight during which two or more aircraft fly close to each other in the same direction with full coordination between them and one of the aircraft is the leader.

G

GENERAL AIR TRAFFIC Flights operating in accordance with civil air traffic services procedures.

GEODETTIC DATUM A minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system/frame.

GLIDE PATH A descent profile determined for vertical guidance during a final approach.

GREGORIAN CALENDAR A calendar in general use; first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar.

Note.— In the Gregorian calendar, common years have 365 days and leap years 366 days divided into twelve sequential months.

GROUND EFFECT A condition of improved performance (lift) due to the interference of the surface with the airflow pattern of the rotor system when a helicopter or other VTOL aircraft is operating near the ground.

Note. – Rotor efficiency is increased by ground effect to a height of about one rotor diameter for most helicopters.

GROUND VISIBILITY The visibility of an aerodrome as reported by an accredited observer or automatic systems.

H

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.

HOLDING FIX A geographical location that serves as a reference for a holding procedure.

HOLDING PROCEDURE A predetermined manoeuvre which keeps an aircraft within a specified airspace while awaiting further clearance.

HOT SPOT A location on the aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary.

HUMAN FACTORS PRINCIPLES A principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

HUMAN PERFORMANCE Human capabilities and limitations which have impact on safety and efficiency of aeronautical operations.

I

IDENTIFICATION The situation which exists when the position indication of a particular aircraft is seen on a situation display and positively identified.

IFR A 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.

INCERFA The word used to designate an uncertainty phase.

INCIDENT An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

Note. – The type of incidents which are of main interest to ICAO for accident prevention studies are listed in the ICAO Accident/Incident Reporting Manual (Doc 9156).

INITIAL APPROACH SEGMENT That segment of an instrument approach procedure between the initial approach fix or, where applicable, the final approach fix or point.

INSTRUMENT APPROACH PROCEDURE 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 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 which utilizes lateral guidance but does not utilize vertical guidance.

Approach procedure with vertical guidance (APV) - An instrument procedure which utilizes lateral and vertical guidance but does not meet the requirements established for precision approach and landing operations.

Precision approach (PA) procedure - An instrument approach procedure using precision lateral and vertical guidance with minima as determined by the category of operation.

Note 1.— The specified minima for visual meteorological conditions are contained in Chapter 3 of Annex 2.

Note 2.— In a control zone, a VFR flight may proceed under instrument meteorological conditions if and as authorized by air traffic control.

INSTRUMENT METEOROLOGICAL CONDITIONS (IMC) 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 in Annex 2.

INSTRUMENT RUNWAY One of the following types of runways intended for the operation of aircraft using instrument approach procedures:

(a) **NON-PRECISION APPROACH RUNWAY**

An instrument runway served by visual aids and a non-visual aid providing at least directional guidance adequate for a straight-in approach.

(b) **PRECISION APPROACH RUNWAY, CATEGORY I -**

An instrument runway served by ILS and visual aids intended for operations down to 60 m (200 ft) decision height and down to an RVR of the order of 800m.

(c) **PRECISION APPROACH RUNWAY, CATEGORY II -**

An instrument runway served by ILS and visual aids intended for operations down to 30 m (100 ft) decision height and down to an RVR of the order of 400m.

(d) **PRECISION APPROACH RUNWAY, CATEGORY III -**

An instrument runway served by ILS to and along the surface of the runway and:-

A: intended for operations down to an RVR of the order of 200 m (no decision height being applicable) using visual aids during the final phase of landing;

B: intended for operations down to an RVR of the order of 50 m (no decision height being applicable) using visual aids for taxiing;

C: intended for operations without reliance on visual reference for landing or taxiing.

INTEGRITY (AERONAUTICAL DATA) A degree of assurance that an aeronautical data and its value has not been lost nor altered since the data origination or authorized amendment.

INTERNATIONAL NOTAM OFFICE An office designated by a State for the exchange of NOTAM internationally.

K

KNOWN TRAFFIC A traffic which is in communication with or the current flight details and intentions of which are known to the controller concerned.

L

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

LANDING SEQUENCE The order in which arriving aircraft are positioned for landing.

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

LOCATION INDICATOR A four-letter code group formulated in accordance with rules prescribed by ICAO and assigned to the location of an aerodrome fixed station.

M

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

MESSAGE FIELD An assigned area of a message containing specified elements of data.

METEOROLOGICAL INFORMATION Meteorological report, analysis, forecast and any other statement relating to existing or expected meteorological conditions.

METEOROLOGICAL OFFICE An office designated to provide meteorological service for international air navigation.

METEOROLOGICAL REPORT A statement of observed meteorological conditions related to a specified time and location.

MINIMUM DESCENT ALTITUDE/HEIGHT A specified altitude/height in a non-precision approach or circling approach below which descent must not be made without the required visual reference.

Note 1: — Minimum descent altitude (MDA) is referenced to mean sea level and minimum descent height (MDH) is referenced to the aerodrome elevation or to the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. A minimum descent height for a circling approach is referenced to the aerodrome elevation.

Note 2: — The required visual reference means that section of the visual aids or of the approach area which should have been seen in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In the case of a circling approach the required visual reference is the runway environment.

MINIMUM FUEL The term used to describe a situation in which an aircraft's fuel supply has reached a state where little or no delay can be accepted.

Note. – This is not an emergency situation but merely indicates that an emergency situation is possible, should any undue delay occur.

MINIMUM SECTOR ALTITUDE The lowest altitude which may be used under emergency conditions which will provide a minimum clearance of 300 metres above all objects located in an area contained within a sector of a circle of 46 km (25nm) radius centred on a radio aid to navigation.

MISSED APPROACH PROCEDURE The procedure to be followed if the approach cannot be continued.

MODE (SSR) The conventional identifier related to specific function of the interrogation signals transmitted by an SSR interrogator. There are 4 modes specified in ICAO Annex 10: A, C, S and intermode.

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).

N

NAVIGATION SPECIFICATION A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:

RNP specification - A navigation specification based on area navigation that

includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.

RNAV specification - A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.

NORMAL OPERATING ZONE (NOZ) Airspace of defined dimensions extending to either side of an ILS course centre line. Only the inner half of the normal operating zone is taken into account in independent parallel approaches.

NOTAM A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

NO TRANSGRESSION ZONE (NTZ) In the context of independent parallel approaches, a corridor of airspace of defined dimensions located centrally between the two extended runway centre lines, where a penetration by an aircraft requires a controller intervention to manoeuvre any threatened aircraft on the adjacent approach.

O

OBSTACLE All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight.

OBSTACLE CLEARANCE ALTITUDE (OCA) or OBSTACLE CLEARANCE HEIGHT (OCH) The lowest altitude or the lowest height or the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria.

Note 1: — Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approaches to the aerodrome elevation or the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. An obstacle clearance height for a circling approach is referenced to the aerodrome elevation.

Note 2: — For convenience when both expressions are used they may be written

in the form "obstacle clearance altitude/height" and abbreviated "OCA/H".

OBSTACLE FREE ZONE (OFZ) The airspace above the inner approach surface, inner transitional surfaces and balked landing surface and that position of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low mass and frangibly mounted one required for air navigation purposes.

OPERATIONAL AIRCRAFT All military aircraft operated in the defensive, offensive and support role.

OPERATIONAL CONTROL The exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight.

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

P

PERFORMANCE-BASED NAVIGATION Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

Note.— Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept.

PILOT-IN-COMMAND The pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight.

POSITION INDICATION The visual indication, in non-symbolic and/or symbolic form, on a situation display, of the position of an aircraft, aerodrome vehicle or other object.

POSITION SYMBOL The visual indication in symbolic form, on a situation display, of the position of an aircraft, aerodrome vehicle or other object, obtained after automatic processing of positional data derived from any source.

PRECAUTIONARY APPROACH A procedure designed to afford a military pilot experiencing flight difficulties a means of landing safely and expeditiously.

PRECIPITATION Any or all forms of water particles whether liquid or solid, that fall from the atmosphere and reach the surface. It is a major class of hydrometeor, distinguished from cloud and virga in that it must reach the surface of the earth.

PRESSURE-ALTITUDE An atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the Standard Atmosphere (as defined in Annex 8).

PRIMARY RADAR A radar system which uses reflected radio signals.

PRIMARY SURVEILLANCE RADAR (PSR) A surveillance radar system which uses reflected radio signals.

PRINTED COMMUNICATIONS A Communications which automatically provide a permanent printed record at each terminal of a circuit of all messages which pass over such circuit.

PROCEDURAL CONTROL Term used to indicate that information derived from an ATS surveillance system is not required for provision of air traffic control service.

PROCEDURAL SEPARATION The separation used when providing procedural control.

PROCEDURE TURN A manoeuvre in which a turn is made away from a designated track followed by a turn in the opposite direction to permit the aircraft to intercept and proceed along the reciprocal of the designated track.

Note 1. – Procedure turns are designated “left” or “right” according to the direction of the initial turn.

Note 2. – Procedure turns may be designated as being made either in level flight or while descending, according to the circumstances of each individual procedure.

PROFILE The orthogonal projection of a flight path or portion thereof on the vertical surface containing the nominal track.

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.

Q

QUADRANTAL CRUISING LEVEL Specified cruising levels determined in relation to magnetic track within quadrants of the compass.

R

RADAR A radio detection device which provides information on range, azimuth and/or elevation of objects.

RADAR APPROACH An approach, in which the final approach phase is executed under the direction of a controller using radar.

RADAR CLUTTER The visual indication on a radar display of unwanted signals.

RADAR CONTACT The situation which exists when the radar position of a particular aircraft is seen and identified on a situation display.

RADAR HANDOVER Transfer of responsibility for the control of aircraft between two controllers using radar, following identification of the aircraft by both controllers.

RADAR SEPARATION The separation used when aircraft position information is derived from radar sources.

RADAR SURVEILLANCE Observation of the movements of aircraft on a radar display and the passing of advice and information to identified aircraft and, where appropriate, to other ATS units.

RADIO NAVIGATION SERVICE A service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more radio navigation aids.

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

READBACK A procedure whereby a receiving station repeats a received message or an appropriate thereof back to the transmitting station so as to obtain confirmation of correct reception.

RECEIVING UNIT/CONTROLLER Air traffic services unit/air traffic controller to which a message is sent.

Note. – See definition of “sending unit/controller”.

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.

REQUIRED NAVIGATION PERFORMANCE(RNP) A statement of the navigation performance accuracy necessary for operation within a defined airspace.

Note. – Navigation performance and requirements are defined for a particular RNP type and or application.

RESCUE COORDINATION CENTRE A unit responsible for promoting efficient organization of search and rescue service and for coordinating the conduct of search and rescue operations within a search and rescue region.

RESCUE UNIT A unit composed of trained personnel and provided with equipment suitable for the expeditious conduct of search and rescue.

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.

RNP TYPE A containment value expressed as a distance in nautical miles from the intended position within which flights would be for at least 95 per cent of the total flying time.

Example. – RNP4 represents a navigation accuracy of plus or minus 7.4km (4NM) on a 95 percent containment basis.

ROUTE SEGMENT A route or portion of route usually flown without an intermediate stop.

RUNWAY A defined rectangular area on a land aerodrome selected or 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.

RUNWAY INCURSION Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft.

RUNWAY VISUAL RANGE The range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line.

S

SAFETY MANAGEMENT SYSTEM (SMS) A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.

SAFETY PROGRAMME An integrated set of regulations and activities aimed at improving safety.

SEARCH AREA The area in which an aircraft is believed to have crashed or forced landed.

SECONDARY RADAR A radar system wherein a radio signal transmitted from the radar station initiates the transmission of a radio signal from another station.

SECONDARY SURVEILLANCE RADAR (SSR) A surveillance radar system which uses transmitters /receivers (interrogators) and transponders.

SEGREGATED PARALLEL OPERATIONS Simultaneous operations on parallel or near-parallel instrument runways in which one runway is used exclusively for approaches and the

other runway is used exclusively for departures.

SENDING UNIT/CONTROLLER Air traffic services unit/air traffic controller transmitting a message.

Note. – See definition of “receiving unit/controller”.

SHORELINE A line following the general contour of the shore, except that in cases of inlets or bays less than 30 nautical miles in width, the line shall pass directly across the inlet or bay to intersect the general contour on the opposite side.

SIGMET INFORMATION Is information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather phenomena which may affect the safety of aircraft operations.

SIGNIFICANT POINT A specified geographical location used in defining an ATS route or the flight path of an aircraft and for other navigation and ATS purposes.

Note: — There are three categories of significant points ground-based navigation aid, intersection and waypoint. In the context of this definition, intersection is a significant point expressed as radials, bearings and/or distances from ground-based navigation aids.

SITUATION DISPLAY An electronic display depicting the position and movement of aircraft and other information as required.

SIMULTANEOUS IFR APPROACH Radar vectoring of aircraft for simultaneous ILS approaches to parallel runways.

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

SSR RESPONSE The visual indication, in non-symbolic form, on a radar display, of a response from an SSR transponder in reply to an interrogation.

STANDARD INSTRUMENT ARRIVAL (STAR) A designated instrument flight rule (IFR) arrival route linking a significant point, normally on an ATS route, with a point from which a published instrument approach procedure can be commenced.

STANDARD INSTRUMENT DEPARTURE (SID) A designated instrument flight rule (IFR) departure route linking the aerodrome or a specified runway of the aerodrome with a specified significant point, normally on a designated ATS route, at which the enroute phase of a flight commences.

STOPWAY A defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off.

SURVEILLANCE RADAR Radar equipment used to determine the position of an aircraft in range and azimuth.

SURVEILLANCE RADAR APPROACH An approach to an aerodrome or a runway by an aircraft under the direction of a radar controller using surveillance radar.

T

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 taxi lane. 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 and 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.

THRESHOLD The beginning of that portion of the runway usable for landing.

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.

TOUCHDOWN The point where the nominal glide path intercepts the runway.

Note: — Touchdown as defined above is only a datum and is not necessarily the actual point at which the aircraft will touch the runway.

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 manoeuvres 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.

TRANSFER OF CONTROL Transfer of responsibility for providing air traffic control service.

TRANSFER OF CONTROL POINTS A defined point located along the flight path of an aircraft, at which the responsibility for providing air traffic control service to the aircraft is transferred from one control unit or control position to the next.

TRANSFERRING UNIT Air traffic control unit/air traffic controller in the process of transferring the responsibility for providing air traffic control service to an aircraft to the next air traffic control unit/air traffic controller along the route of flight.

TRANSITION ALTITUDE The altitude at or below which the vertical

position of an aircraft is controlled by reference to altitudes.

TRANSITION LAYER The airspace between the transition altitude and the transition level.

TRANSITION LEVEL The lowest flight level available for use above the transition altitude.

U

UNCERTAINTY PHASE A situation wherein uncertainty exists as to the safety of an aircraft and its occupants.

UNLAWFUL INTERFERENCE An unlawful attempt, successful or otherwise, being made to take over control of an aircraft, or any act of violence against an aircraft being committed, attempted or threatened.

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 Annex 2, Appendix 4.

V

VECTORIZING Provision of navigation guidance to aircraft in the form of specific headings, based on the use of an ATS surveillance system.

VFR The symbol used to designate the visual flight rules.

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

VIDEO MAPPING The electronic superimposing of a map or plan on a radar display.

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 recognised when observed against a bright background;

(b) the greatest distance at which lights in the vicinity of 1,000 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 APPROACH An approach by an IFR flight when either part or all of an instrument approach procedure is not completed and the approach is executed in visual reference to terrain.

VISUAL APPROACH (CIRCLING) The visual phase of flight, after completing an instrument approach, to bring the aircraft into position for landing on a runway which is not suitably located for straight-in approach.

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 in Annex 2, Chapter 4.

VMC The symbol used to designate visual meteorological conditions.

W

WAKE TURBULENCE CONDITIONS The disturbance to the surrounding atmosphere created by an operating aircraft and may be used to refer to any or all of the following:

- (a) Jet-engine blast
- (b) Prop wash
- (c) Wing-tip vortices
- (d) Rotor vortices

WAYPOINT A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation. Waypoints are identified as either:

Fly-by waypoint - A waypoint which requires turn anticipation to allow tangential interception of the next segment of a route or procedure, or

Flyover waypoint - A waypoint at which a turn is initiated in order to join the next segment of a route or procedure.

WIND SHEAR A change in wind speed and/or direction in space, including updrafts and downdrafts.

1.3 Abbreviations

The following list contains key abbreviations used in this Manual, as well as others likely to be in common use in the operation of the Airport. A more complete list of abbreviations used in the composition of NOTAM is available in AIP.

AIRPROX	Airport Proximity Report
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
AEP	Airport Emergency Plan
AGL	Above Ground Level
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation And Control
AIS	Aeronautical Information Service/S
AMSL	Above Mean Sea Level
ANO	Air Navigation Order
ANR	Air Navigation Regulation
AOC	Aerodrome Obstacle Chart
AOC	Air Operator's Certificate
APU	Auxiliary Power Unit
ARP	Aerodrome Reference Point
ASDA	Accelerate-Stop Distance Available
ASI	Airport Safety Inspector
ASIC	Aviation Security Identification Card
ATC	Air Traffic Control
ATS	Air Traffic Services
ATSU	Air Traffic Services Unit
AT-VASIS System	Abbreviated T (one side only)-Visual Approach Slope Indicator System
AVGAS	Aviation Gasoline
AVTUR	Aviation Turbine Fuel (Jet-A1)
CAA	Civil Aviation Authority
CAAP	Civil Aviation Advisory Publication
CAO	Civil Aviation Order
CAR	Civil Aviation Regulation
CofA	Certificate Of Airworthiness
DAP	Departure and Approach Procedures

Manual of Standards ATM

DISPLAN	Disaster Plan
DME	Distance Measuring Equipment
DTB	Domestic Terminal Building
EAT	Expected Approach Time
ECC	Emergency Coordination Center
EOC	Emergency Operations Center
ELB	Emergency Locator Beacon
EST	Eastern Standard Time
EST	Estimated
GA	General Aviation
GP	Glide Path
HAZMAT	Hazardous Materials
HD	Hazard Division
HF	High Frequency (3,000 – 30,000 Khz)
HJ	Daylight Hours (Sunrise to Sunset)
HLS	Helicopter Landing Site
HN	Hours (Sunset to Sunrise)
IAL	Instrument Approach and Landing Chart
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IM	Inner Marker
IMC	Instrument Meteorological Conditions
ITB	International Terminal Building
ITCC	International Terminal Control Centre
IWDI	Illuminated Wind Direction Indicator
IWI	Illuminated Wind Direction Indicator
LDA	Landing Distance Available
MAG	Magnetic
MATC	Manager Air Traffic Control
MATS	Manual of Air Traffic Services
MAUW	Maximum All Up Weight
MOR	Mandatory Occurrence Report
NDB	Non-Directional Beacon

Manual of Standards ATM

NOTAM	Notice To Airmen
PANS-OPS	Procedures for Air Navigation Services – Aircraft Operations
PAPI	Precision Approach Path Indicator
QFE Q Code	– Altimeter Setting To Obtain Height Above The Airport Datum
QNH Q Code	– Altimeter Setting To Obtain Altitude (Height AMSL)
RFFS	Rescue and Fire Fighting Service
RVR	Runway Visual Range
SATCO	Senior Air Traffic Control Officer
SID	Standard Instrument Departure
SIR	Security Incident Report
T-VASIS	T-Visual Approach Slope Indicator System
UTC	Coordinated Universal Time
VASIS	Visual Approach Slope Indicator System
VFR	Visual Flight Rules
VHF	Very High Frequency (30 – 300 Mhz)
VMC	Visual Meteorological Conditions
VOR	Very High Frequency Omni-Directional Radio Range

SECTION I.

ATS SAFETY MANAGEMENT

CHAPTER 1. ATS SAFETY MANAGEMENT

1.1 General

The Liberia Civil Aviation Authority (LCAA) shall ensure that the level of Air Traffic Services (ATS) and Communications, Navigation and Surveillance, and ATS Procedures are appropriate and adequate for maintaining an acceptable level of safety in our airspace and aerodrome.

1.2 Objectives

The Objectives of ATS Safety Management Program are to ensure that:

- a. The established level of safety applicable to the provision of ATS within our airspace or aerodrome is met; and
- b. Safety related enhancements are implemented whenever necessary

1.2.1 ATS Safety Management

An ATS Safety Management Program should include:

- a. Monitoring of overall safety level and detection of any adverse trend
- b. Safety reviews of ATS units
- c. Safety assessments of system changes
- d. Safety enhancing measures

All activities undertaken in an ATS Safety Management Program shall be fully documented. All documentation shall be retained for such period of time as specified by the appropriate authority.

1.2.2 Monitoring of Safety Levels

The appropriate ATS authority should establish a formal incident reporting system for ATS personnel to facilitate the collection of information on actual or potential safety hazards or deficiencies related to the provision of ATS, including:

- a. Route structures;
- b. Procedures;
- c. Communications;
- d. Navigation and surveillance systems;
- e. Other safety significant systems; and
- f. Equipment as well as controller workload.

Information gathered should include:

- a. Safety related reports concerning the operation of Air Traffic Services (including Air Traffic Incident Reports).
- b. Reports concerning the serviceability of ATS facilities and systems, such as failures and degradations of communications, surveillance and other safety significant systems and equipment.

1.3 Safety Review

1.3.1 Requirement

Safety reviews of ATS units shall be conducted regularly and systematically by personnel qualified through training, experience, and expertise and having a full understanding of relevant Standards And Recommended Practices (SARPS), Procedures for Air Navigation Services (PANS), Safe Operating Practices and Human Factors Principles.

1.3.2 Scope

The scope of ATS Unit Safety Review should include at least the following issues:

(1) Regulatory

- a. ATS Operating Manuals, ATS Unit Instructions and Air Traffic Control (ATC) coordination procedures are complete, concise and up-to-date;
- b. ATS Route Structure
- c. The Separation Minima used in the airspace or aerodrome operations are appropriate;
- d. Appropriate procedures for low visibility aerodrome operations are in place;
- e. Traffic volumes and associated controller workloads do not exceed defined, safe levels and that procedures are in place for regulating traffic volumes whenever necessary.
- f. Procedures to be applied in the event of failure or degradation of ATS system, including communications, navigation and surveillance system;
- g. Procedures for the reporting or incidents and other safety related occurrences are implemented.

(2) Operational and Technical

- a. The environmental working conditions meet established levels for temperature, humidity, ventilation, noise and ambient lighting and do not adversely affect controller performance.
- b. Automation systems generate and display flight plan, control and coordination data in a timely, accurate and easily recognizable manner and in accordance with human factor principles;

- c. Equipment, including input/output devices for automation systems, are designed and positioned in the working position in accordance with ergonomic principles;
- d. Communications, navigation, surveillance and other safety significant systems and equipment;
 - i. Are tested for normal operations on a routine basis;
 - ii. Meet the required level of reliability and availability as defined by the appropriate authority;
 - iii. Provide for the timely and appropriate detection and warning of system failure and degradations;
 - iv. Include documentation on the above;
 - v. Include measures to control the probability of failures and degradation's; and
 - vi. Include adequate back-up facilities and/or procedures in the event of a system failure or degradation; and
- e. Detailed records of systems and equipment serviceability are kept and periodically reviewed.

1.4 Licensing and Training

- a. Controllers are adequately trained and properly licensed with valid ratings;
- b. Controller competency is maintained by adequate and appropriate refresher training, including the handling of aircraft emergencies and operations under conditions with failed and degraded facilities and systems;
- c. Where the ATC Unit/Control Sector is staffed by teams, controllers are provided with relevant and adequate training in order to ensure efficient team work;
- d. The implementation of new or amended procedures, and new or updated communications, surveillance and other safety significant systems and equipment is preceded by appropriate training and instruction;
- e. Controller competency in the English Language is satisfactory; and
- f. Standard Phraseology is used.

1.5 Safety Assessment

A Safety Assessment shall be carried out in respect of proposals for significant airspace reorganizations, changes in the provision of ATS Procedures and for the introduction of new equipment, systems or facilities such as:

- a. A reduced separation minimum;
- b. A new operating procedure, including departure and arrival procedures;
- c. A reorganization of ATS Route Structure;
- d. A reorganization of an airspace;

- e. Physical changes to the layout of runways and/or taxiway;
- f. Implementation of new communications, surveillance or other safety significant systems and equipment, including those providing new functionality and/or capabilities.

Proposal shall be implemented only when the assessment has shown that an acceptable level of safety will be met.

1.5.1 Safety Significant Factors

Safety Assessments shall consider relevant all factors determined to be safety-significant, to include:

- a. Types of aircraft and their performance characteristics;
- b. Traffic Density and Distribution;
- c. Airspace complexity, ATS Route Structure and Classification of the airspace;
- d. Aerodrome layout, including runway and taxiway configuration and runway length;
- e. Type of air ground communications and time parameters for communication dialogues;
- f. Any significant local or regional weather phenomena.

1.5.2 Safety Enhancing Measures

Any actual or potential hazard related to the provision of ATS within airspace or at an aerodrome whether identified through an ATS Safety Activity or by other means, shall be assessed and classified by the appropriate ATS authority for its risk acceptability.

CHAPTER 2. ATS SAFETY CAPACITY & AIR TRAFFIC FLOW MANAGEMENT

2.1 Capacity Management

The capacity of an ATS system depends on many factors, including:

- a. ATS route structure
- b. The navigation accuracy of the aircraft using the airspace,
- c. Weather related factors, and
- d. Controller workload.

Every effort should be made to provide sufficient capacity to cater to both normal and peak traffic levels; however, in implementing any measures to increase capacity, the responsible ATS authority shall ensure that the safety levels are not jeopardized.

ATC capacity should be expressed as the maximum number of aircraft which can be accepted over a given period of time within the airspace or at the aerodrome concerned.

2.2 Capacity Assessment

In accessing capacity values, factors to be taken into account should include among other the following:

- a. The level and type of ATS provided;
- b. The structural complexity of the control area, the control sector of the aerodrome concerned;
- c. Controller workload, including control and coordination task to be performed;
- d. The types of communications, navigation and surveillance system in use, their degree of technical reliability and availability as well the availability of back-up systems and/or procedures;
- e. Availability of ATC systems providing controller support and alert functions; and
- f. Any other factor or element deemed relevant to controller workload.

2.2.1 Regulation of ATC capacity and traffic volume

To ensure that safety is not compromised whenever the traffic demand in an airspace or at an aerodrome is forecast to exceed the available ATC capacity, measures shall be implemented to regulate traffic volume accordingly.

2.2.2 Enhancement of ATC Capacity

The appropriate ATS authority should:

- a. Periodically review ATS capacities in relation to traffic demand; and
- b. Provide the flexible use of airspace in order to improve the efficiency of operations and increase, capacity.

In the event that traffic demand regularly exceeds ATC capacity, resulting in continuing and frequent traffic delays, or it becomes apparent that forecast traffic demand will exceed capacity values, the appropriate ATS authority should, as far as practicable:

- a. Implement steps aimed at maximizing the use of the existing system capacity; and
- b. Develop plans to increase capacity to meet the actual or forecast demand.

2.2.3 Flexible Use of Airspace

The appropriate authorities, through the establishment of agreements and procedures, should make provision for the flexible use of all airspace in order to increase airspace capacity and to improve the efficiency and flexibility of aircraft operations.

Agreements and procedures provided for the flexible use of airspace should specify, among others the following:

- a. The horizontal and vertical limits of the airspace concerned;
- b. The classification of any airspace made available for use by civil air traffic;
- c. Units or authorities responsible for transfer of the airspace;
- d. Conditions for transfer of the airspace to the ATC unit concerned;
- e. Conditions for transfer of the airspace from the ATC unit concerned;
- f. Periods of availability of the airspace;
- g. Any limitations on the use of the airspace concerned; and
- h. Any other relevant procedures or information.

2.3 Air Traffic Flow Management (ATFM)

Air Traffic Flow Management (ATFM) service shall be implemented for airspace where traffic demand at times exceeds the defined ATC capacity. It is done on the basis of a regional air navigation agreement or, when appropriate, as a multilateral agreement.

2.3.1 Flow Management Procedures

ATFM should be carried out in three phases:

- a. Strategic planning
- b. Pre-tactical planning

c. Tactical operations

a. Strategic Planning

If the action is carried out more than one day before the day on which it will take effect, it is normally carried out well in advance, typically two to six months ahead.

Strategic planning should be carried out in conjunction with ATC and the aircraft operators consisting of:

- i.** Examining the demand for the forthcoming season;
- ii.** Assessing where and when demand is likely to exceed the available ATC capacity; and
- iii.** Taking steps to resolve the imbalance by:
 - 1.** Arranging with ATC Authority to provide adequate capacity at the require place and time;
 - 2.** Re-routing certain traffic flows (Traffic Orientation);
 - 3.** Schedule or rescheduling flights as appropriate; and
 - 4.** Identifying the need for tactical ATFM measures.

b. Pre-Tactical Planning

If the action is to be taken on the day before the day on which it will take effect.

Pre-tactical planning should entail fine tuning of the strategic plan in the light of updated demand data during this phase;

- i.** Certain traffic flows may be reduced;
- ii.** Off-load routes may be coordinated;
- iii.** Tactical measures will be decided upon; and
- iv.** Details for the ATFM plan for the following day should be published and made available to all concerned;

c. Tactical Operations

If the action is taken on the day on which it will take effect.

Tactical ATFM operations should consist of:

- i.** Executing the agreed tactical measures in order to provide a reduced and even flow of traffic where demand would otherwise have exceeded capacity;
- ii.** Monitoring the evolution of the Air Traffic situation to ensure that the ATFM measures applied are having the desired effect and to take or initiate remedial action when long delays are reported, including re-routing of traffic and flight level allocation, in order to utilize the available ATC capacity to the maximum extent.

2.4 *Liaison*

The responsible units should liaise closely with ATC and the aircraft operators in order to ensure an effective and equitable service.

SECTION II.

AIR TRAFFIC SERVICES

CHAPTER 1. AIR TRAFFIC SERVICES

1.1 Objectives

The objectives of the Air Traffic Services (ATS) shall be to:

- Prevent collision between aircraft;
- Prevent collisions between Aircraft on the maneuvering area and obstructions on that area;
- Expedite and maintain an orderly flow of Air Traffic;
- Provide advice and information useful for the safe and efficient conduct of flights;
- Notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required.

1.2 Divisions of the Air Traffic Services

Air Traffic Services shall comprise three services identified as follows:

1. Air Traffic Control service
 - (a) Area Control Service
 - (b) Approach Control Service
 - (c) Aerodrome Control Service
2. Flight Informant Service
3. Alerting Service

1.2.1 Air Traffic Control Service

A service provided for the purpose of:

1. Preventing collisions between aircraft.
2. Preventing collisions on the maneuvering area between aircraft and obstructions.
3. Expediting and maintaining an orderly flow of air traffic.

(a) Area Control Service

Air Traffic Control Service for controlled flights in control area provided by:

1. An Area Control Center (ACC); or
2. The unit providing approach control service in a control zone or in a control area of limited extent, which is designated primarily for the provision of approach control service when no ACC is established.

(b) Approach Control Service

Air Traffic Control Service for Arriving or departing controlled flight provided by:

1. An Aerodrome control tower or an ACC, when it is necessary or desirable to combine under the responsibility of one unit the functions of the approach control service and those of aerodrome control service or the area control service; or
2. An approach control unit, when it is necessary or desirable to establish a separate unit.

(c) Aerodrome Control Service

Air Traffic Control Service for Aerodrome Traffic provided by: An aerodrome control tower.

1.2.2 Flight Information Service

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

1.2.3 Altering Service

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

Flight information service and Alerting Service shall be provided as follows:

1. Within a Flight Information Region (FIR): by a flight information centre, unless the responsibility for providing such services is assigned to an air traffic control unit having adequate facilities for the exercise of such responsibilities;
2. Within controlled airspace and at controlled aerodromes: by the relevant air traffic control units.

Determination of the need for Air Traffic Services the need for the provision of Air Traffic Services shall be determined by consideration of the following:

1. The type of Air Traffic involved;
2. The density of Air Traffic;
3. The meteorological conditions; and
4. Such other factors as may be relevant.

1.3 Division of Air Space

When it has been determined that Air Traffic Services will be provided in particular portion of the Airspace or at particular aerodromes, then those portions of the airspace or those aerodromes shall be designated in relation to the air traffic services that are to be provided.

The designation of the particular portions of the airspace or the particular aerodromes shall be as follows:

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1. Flight information region: those portion of the airspace where it is determined that flight information service and alerting service are provided
2. Control Area and Control Zone: those portion of the airspace where it is determined that air traffic control service will be provided to IFR and VFR flights.
3. Controlled aerodrome: those aerodromes where it is determined that air traffic control service will be provided to aerodrome traffic.

1.4 Classification of Airspace

ATS airspace shall be classified and designated in accordance with the following:

Class	Type of flight	Separation Provided	Service Provided	Communication Requirement	ATC Clearance
A	IFR only	All Aircraft	ATC Service	Continuous Two-Way	Yes
B	IFR	All Aircraft	ATC Service	Continuous Two-Way	Yes
	VFR	All Aircraft	ATC Service	Continuous Two-Way	Yes
	IFR	IFR From IFR	ATC Service	Continuous Two-Way	Yes
		IFR From VFR			
C	VFR	VFR From IFR	1- ATC Service for separation from IFR; 2-VFR/VFR Traffic information/and traffic avoidance advice on request)	Continuous Two-Way	Yes
D	IFR	IFR From IFR	ATC Service, Traffic information about VFR Flights (and traffic avoidance advice on request)	Continuous Two-Way	Yes
	VFR	NIL	IFR/VFR and VFR/VFR traffic information (And traffic avoidance advice on request)	Continuous Two-Way	Yes
E	IFR	IFR From IFR	ATC Service and as far as practical, traffic information about VFR Flights	Continuous Two-Way	Yes
	VFR	NIL	Traffic information as far as practical	No	No
F	IFR	IFR From IFR as far as practical	Air traffic Advisory service; flight information service	Continuous Two-Way	No
	VFR	NIL	Flight Information Service	No	No
G	IFR	NIL	Flight information	Continuous Two-Way	No

1.5 Responsibility for Control

1.5.1 Individual Flight

A controlled flight shall be under the control of only one air traffic control at any given time.

1.5.2 Between Air Traffic Control Units

The appropriate ATC authority shall designate the area of responsibility for each air traffic control (ATC) unit.

Where there is more than one ATC working position within a unit or sector, the duties and responsibilities of the individual working positions shall be defined.

1.5.3 Transfer of Control

The responsibility for the control of an aircraft shall be transferred from one air traffic control unit to another at an agreed:

1. Point
2. Level
3. Time

1.5.4 Between a unit providing aerodrome control service and approach control service

Except for flights, which are provided aerodrome control services only, the control of arriving and departing controlled flights shall be divided between units providing aerodrome control service and units providing approach control service as follows:

1.5.5 Arriving Aircraft

Control of an arriving aircraft shall be transferred from the unit providing approach control service to the unit providing aerodrome control service when the aircraft:

- (a) Is in the vicinity of the aerodrome, and:
 1. It is considered that approach and landing will be completed in visual reference to the ground, or
 2. Has reached uninterrupted visual meteorological conditions, or
- (b) Is at a prescribed point or level, or
- (c) Has landed

As specified in letters of agreement or ATS unit instructions.

Transfer of communications to the aerodrome control should be effected at such a point, level or time that clearance to land or alternative instructions, as well as essential local traffic, can be issued in a timely manner.

1.6.6 Departing Aircraft

Control of a departing aircraft shall be transferred from the unit providing aerodrome control service to the unit providing aerodrome control service to the unit providing approach control service:

- (a) When Visual Meteorological Conditions (VMC) prevail in the vicinity of the aerodrome:
1. Prior to the time the aircraft leaves the vicinity of the aerodrome,
 2. Prior to the aircraft entering instrument meteorological conditions, or
 3. When the aircraft is at a prescribed point or level,

As specified in letters of agreement or ATS unit instructions;

- (b) When Instrument Meteorological Conditions (IMC) prevail at the aerodrome:
1. Immediately after the aircraft is airborne, or
 2. When the aircraft is at a prescribed point or level.

As specified in letters of agreement or local instructions.

1.5.7 Between a unit providing approach control service and area control service

When area control and approach control service are not provided by the same air traffic control unit, responsibility for controlled flight shall rest with the unit providing approach control service except that a unit providing approach control service shall be responsible for the control of:

1. Arriving aircraft that have been released to it by the ACC;
2. Departing air flight until such aircraft are released to the ACC.

A unit providing approach control service shall assume control of arriving aircraft provided such aircraft have been released to it, upon arrival of the aircraft at the point, level or time agreed for transfer of control, and shall maintain control during approach to the aerodrome.

CHAPTER 2. FLIGHT PLAN

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.

The full flight plan is not required for special VFR flight but the pilot must give brief details of the callsign, aircraft type and pilot's intentions. A full flight plan is required if the pilot wishes his destination to be notified.

2.1 Filing of Flight Plans

Flight plans fall into two categories:

- a. Full flight plans; the information required on ICAO model flight plan form
- b. Abbreviated flight plan; the limited information required to obtain a clearance for a portion of flight (e.g. Flying in control zone, crossing an airway) filed either on the RTF or by telephone prior to take off.

The destination aerodrome will be advised of the flight only if the flight plan information covers the whole route of the flight. An airborne flight plan may be filed provided that the pilot leaves sufficient time for the clearance to be issued before the aircraft reaches the boundary of the controlled airspace (normally 10 minutes).

2.2 Submission of Flight Plan

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 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, altering 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 coordination with appropriate military units or with air traffic unit in adjacent states in order to avoid the possible need for interception for the purpose of identification,
- e. Any flight across international borders.

A pilot who has filed a flight plan to a destination without an Air Traffic Services Unit (ATSU) and not connected to the Aerodrome Fixed Telecommunication Network (AFTN) shall comply with the following procedures:

- a. Nominate a responsible person at his destination and inform him of the planned Estimated Time of Arrival (ETA). If the aircraft fails to arrive within 30 minutes of the ETA the responsible person will notify the parent ATSU. That ATSU will then initiate alerting action, or
- b. If no responsible person can be found, the pilot will contact the parent ATSU and request that they act in the same capacity. The pilot is then required to inform the parent ATSU of his arrival within 30 minutes of the notified ETA, otherwise alerting action will automatically be initiated.

2.2.1 Repetitive Flight Plan

The repetitive flight plan scheme is a more convenient method of filing flight plans for flights that operate regularly. Only one plan is filed and the details are brought forward for each flight.

2.3 Prior to Departure

Except when other arrangements have been made for submission of repetitive flight plans, a flight plan submitted prior to departure should be submitted to the air traffic services reporting office at the departure aerodrome. If no such unit exists at the departure aerodrome, the flight plan should be submitted to the unit serving or designated to serve the departure aerodrome.

In the event of a delay of 30 minutes in excess of the estimated off-block time for a controlled flight or a delay of one hour for an uncontrolled flight for which a flight plan should be amended or a new flight plan submitted and the old flight plan cancelled, whichever is applicable during flight.

2.4 During flight

A flight plan to be submitted during flight should normally be transmitted to the ATS unit in charge of the FIR, control area, advisory area or advisory route in or on which the aircraft is flying, or in or through which the aircraft wishes to fly or to the aeronautical telecommunication station serving the air traffic services unit concerned. When this is not practicable, it should be transmitted to another ATS unit or aeronautical telecommunication station for retransmission as required to the appropriate air traffic services unit.

2.5 Acceptance of a flight plan

The first ATS unit receiving a flight plan, or change thereto, shall:

- a. Check it for compliance with the format and data conventions;
- b. Check it for completeness and, to the extent possible, for accuracy;
- c. Take action, if necessary, to make it acceptable to the air traffic services;
and
- d. Indicate acceptance of the flight plan or change thereto to the originator.

2.6 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
- Estimated off-block time
- Cruising levels
- Route to be followed
- Destination aerodrome and total estimated elapsed time
- Alternative aerodrome(s)
- Fuel endurance
- Total number of persons on board
- Emergency and survival equipment
- Other information

2.7 Visual Flight Rule (VFR)

VFR flights shall be conducted so that the aircrafts flown in conditions of visibility and distance from clouds equal to or greater than those in the table below.

VFR flights shall not take off or land at an aerodrome within a control zone, or enter the aerodrome within a control zone, or enter the aerodrome traffic zone or traffic pattern:

- a. When the ceiling is less than 450M (1500ft); or
- b. When the ground visibility is less than 5KM

2.8 Instrument flight rules (IFR)

Aircraft shall be equipped with suitable instruments and with navigation equipment appropriate to the route to be flown.

2.9 Change from IFR to VFR flight

Change from instrument flight rule (IFR) flight to visual flight rule (VFR) flight is only acceptable when a message initiated by the pilot-in-command containing the specific expression “canceling MY IFR flight” together with the changes, if any, to be made to the current flight plan, is received by an air traffic services unit. No invitation to change from IFR flight to VFR flight is to be made either directly or by inference.

No reply, other than the acknowledgement “IFR flight cancelled at ... (time)” should normally be made by an air traffic services unit.

ATS unit in possession of information that instrument meteorological conditions are likely to be encountered along the route of flight; a pilot changing from IFR flight to VFR flight should be advised.

2.10 Within controlled airspace

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.

An IFR flight operating in cruising flight in controlled airspace shall be flown at a cruising level appropriate to its track as specified in the table below.

Track

From 000 degrees-179 degrees From 180 degrees-359 degrees

From 000 degrees-179 degrees		From 180 degrees-359 degrees	
IFR Flights	VFR Flights	IFR Flights	VFR Flights
Flight Level (FL)		FL	FL
10	35	20	45
30	55	40	65
50	75	60	85
70	95	80	105
90	115	100	125
110	135	120	145
130	155	140	165
150 etc up to	175	160 etc up to	185
290	195	280	—

2.11 Suspension of Visual Flight Rules

Any or all visual Flight Rule (VFR) operations on and in the vicinity of the aerodrome may be suspended by any of the following units, persons or authorities whenever safety requires such action:

- a. The approach control unit or the appropriate area control center;
- b. The aerodrome control tower;
- c. The appropriate ATS authority.

All such suspensions of VFR operations shall be accomplished through or notification to the aerodrome control tower.

The following procedures shall be observed by the aerodrome control tower whenever VFR operations are suspended:

- (a) Hold all VFR departures;
- (b) Recall all local flights operating under VFR or obtain approval for special VFR operations;

- (c) Notify the approach control unit or area control centre as appropriate of the action taken;
- (d) Notify all operators, or their designated representatives, of the reason for taking such action if necessary or requested.

2.12 Authorization of Special VFR

When traffic conditions permit, special VFR flights may be authorized subject to approval of the unit providing approach control service

When the ground visibility is not less than 1500m, special VFR flights may be authorized to enter a control zone for the purpose of landing, taking off and departing from a control zone, crossing a control zone or operating locally within a control zone.

CHAPTER 3. SEPARATION METHODS AND MINIMA

3.1 Separation

Separation shall be effected between IFR flights and special VFR flight in accordance with separation minima.

3.1.1 Provision for the separation of controlled traffic

Vertical or horizontal separation shall be provided between:

- a. All flights in class A and B airspaces;
- b. IFR flights in class C,D and E airspaces ;
- c. IFR flights and VFR flights in class C airspace;
- d. IFR flights and special VFR flights; and
- e. Special VFR flights, when so prescribed by the appropriate ATS authorities

3.2 Increased separation

Separation standards and minima shall be increased when:

- a. Requested by the pilot;
- b. A controller considers it necessary;
- c. Directed by the appropriate authority.

3.3 Reduced separation

3.3.1 In the vicinity of aerodrome

In the vicinity of the aerodromes, the standard separation may be reduced if:

- a. Adequate separation can be provided by the aerodrome controller when each aircraft is continuously visible to this controller; or
- b. Each aircraft is continuously visible to the flight crews of the other aircraft concerned and the pilot thereof report that they can maintain their own separation; or
- c. In the case of one aircraft following another, the flight crew of the succeeding aircraft reports that the other aircraft is in sight and separation can be maintained.

3.3.2 Search and rescue escort

Standard separation may be reduced when a search and rescue aircraft is escorting an aircraft in emergency.

3.4 Loss of Separation

If, for any reason, a controller is faced with a situation in which two or more aircraft are separated by less than the prescribe minima (for example, air traffic control error or differences in pilot's estimated and actual time over reporting points) he is to:

- a. Use every means at his disposal to obtain a require minimum with the least possible delay, and
- b. When considered practicable, pass essential traffic information.

3.5 Essential Traffic Information

Essential traffic is that control traffic to which the provision of separation by ATC is applicable but which, in relation to a particular controlled flight, is not, or will not be, separated from other controlled traffic by the appropriate separation minimum.

Essential traffic information shall be given to controlled flights concerned whenever they constitute essential traffic to each other.

Essential traffic information passed to an aircraft shall include:

- a. Direction of flight of aircraft concerned;
- b. Type and wake turbulence category of aircraft concerned; and
- c. Cruising level of aircraft concerned thus:
 1. Estimated time over the reporting point nearest to where the level will be crossed; or,
 2. Relative bearing of the aircraft concerned in terms of the twelve hours clock as well as distance from the conflicting traffic, or
 3. Actual or estimated position of the aircraft concerned.

3.6 Vertical Separation

Vertical separation is obtained by requiring aircrafts using prescribed altimeter setting procedures to operate at different levels expressed in terms of flights levels or altitude.

Vertical Separation Minimum (VSM) shall be:

- a. A normal 1000ft below FL 219 and a normal 2000ft at or above FL219
- b. Within designated airspace, a normal 1000ft Below FL410 and a normal 2000ft at or above this level.

3.6.1 Cruising levels

An aircraft may be cleared to change cruising level at a specified time, place or rate.

3.6.2 During climb or descent

An aircraft may be cleared to a level previously occupied by another aircraft after the latter has reported vacating it, except when:

- a. Severe turbulence is known to exist;
- b. The higher aircraft is effecting a cruise climb; or
- c. The difference in aircraft performance is such that less than the applicable separation minimum may result.

In the case of exceptions, such clearance shall be withheld until the aircraft vacating the level has reported at or passing another level separated by the required minimum.

3.6.3 VMC Climb or Decent

To avoid excessive delays to traffic, controller may authorize an aircraft to climb or descend in VMC provided:

- a. Essential traffic information is given;
- b. The pilot of the aircraft climbing or descending agrees to maintain his own separation from aircraft;
- c. It is during the hours of the day light;
- d. The aircraft is flying in VMC.

3.7 Horizontal Separation

The three types of horizontal separation are:

- a. Lateral
- b. Longitudinal
- c. Radial

3.8 Explanation of terms

“**Level change**” means the portion of the climb and descent during the vertical separation in relation to the level of another aircraft is less than the minimum.

An “**Exact reporting point**” is a position established by a navigational facility, which is:

- a. Overhead a VOR
- b. Overhand an NDB
- c. A position which has been notified as a reporting point and which is established by the intersection of VOR radials, or of a VOR radial and a bearing from an Non-Directional Beacon (NDB)
- d. A position established by VOR radial combined with a range from a co-located or associated D and E

Separation based on VOR/DME information where measured distance values are used, each aircraft must be using the same on “track” VOR/DME facility. i.e., the aircraft must be flying towards or away from the same facility.

Communication must be maintained with the aircraft concerned throughout the period that measured distance values are being used to achieve separation. Separation is to be checked by using simultaneous DME readings from aircrafts at intervals of not more than 10 minutes.

3.9 Lateral Separation

Lateral separation shall be applied so that the distance between those portions of the intended route for which the aircraft are to be laterally separated is never less than an establish distance to account for navigational inaccuracies plus a specified buffer.

Means by which lateral separation may be applied include:

- a. Geographical Separation
- b. Track Separation

3.9.1 Geographical Separation

Geographical separation shall be established by position reports, which positively indicate that the aircraft are over different geographical locations as determined visually, or by reference to navigation aid.

3.9.2 Track Separation

Track separation shall be established by requiring aircrafts to fly on specified tracks, which are separated by a minimum amount appropriate to the navigation aid or method employed.

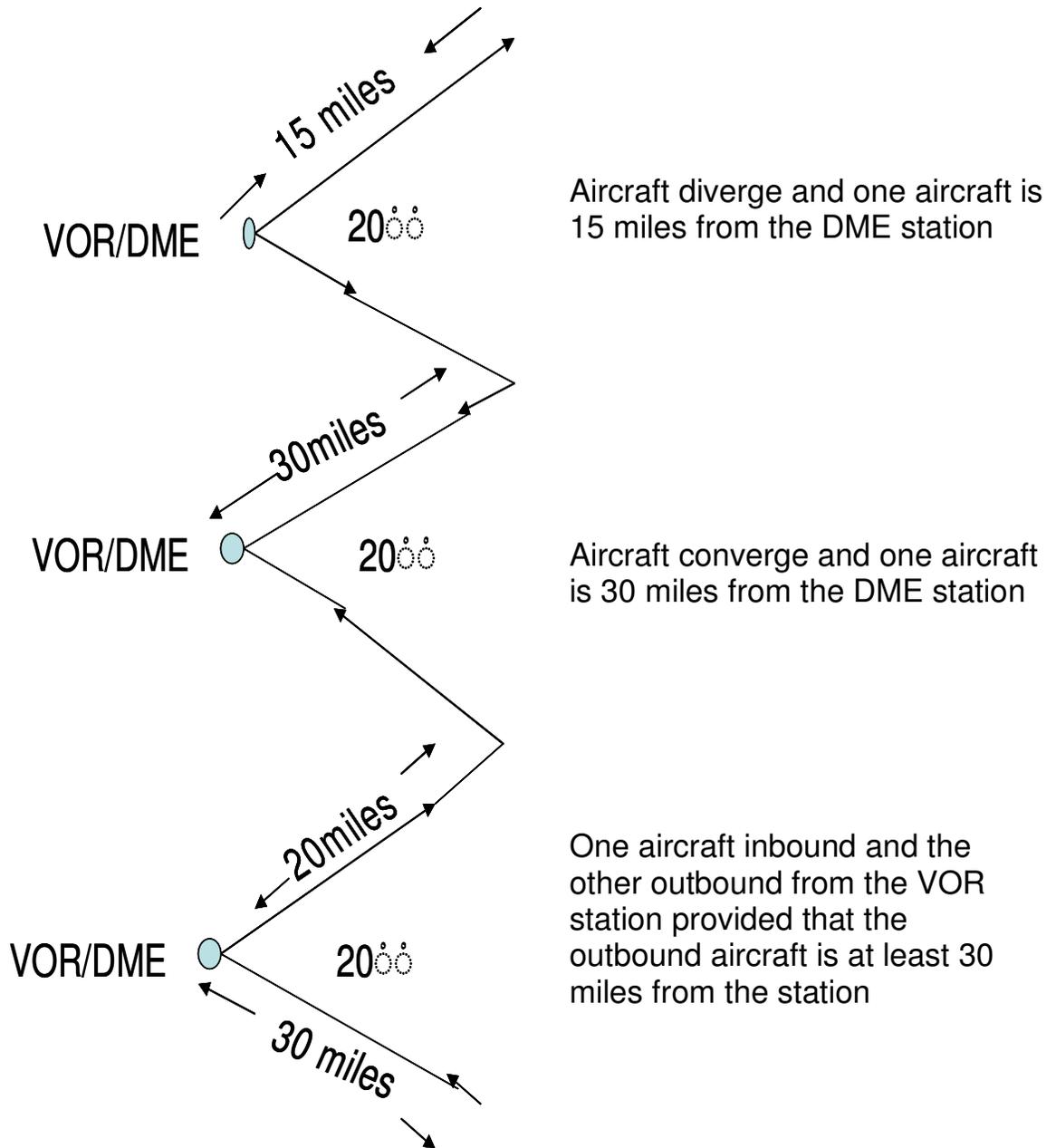
Lateral Separation between two aircraft exists when:

- A. Using a VOR/DME-Both aircraft must have reported established on radials at least 20 degrees apart;
- B. Using VOR radials; when one aircraft is a time equivalent of 15 miles or 4 minutes (whichever is greater) from the VOR and both aircraft have reported established on redials which diverge by 20° or more;
- C. Using VOR radials; both aircraft must have phased a VOR on tracks diverging by 45° or more and have reported established on the relevant radials;
- D. Using specified tracks from an NDB; when one aircraft is the time equivalent of 15 miles or 4 minutes (whichever is greater) from an NDB and both aircraft have reported established on tracks diverge by 30° or more.

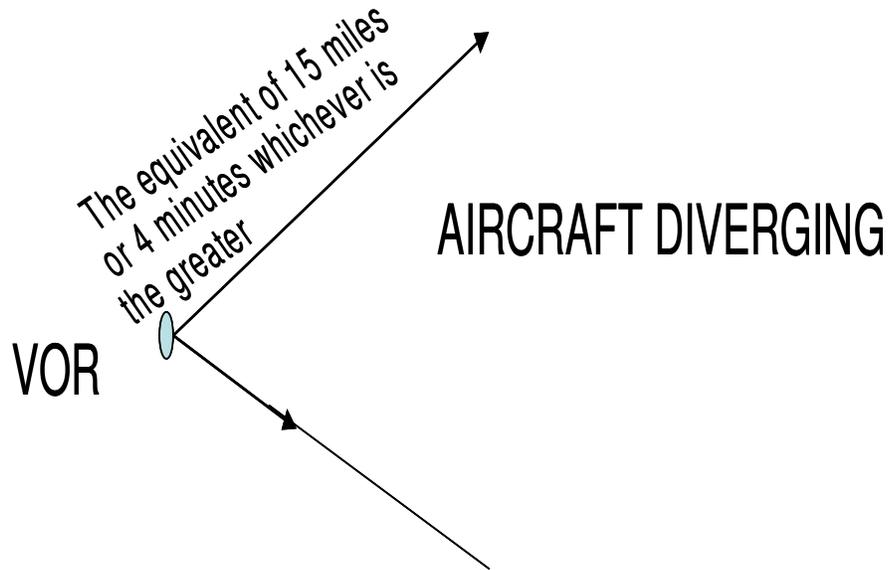
Illustrations of the above separation cases appear on the following pages.

Lateral Separation Between Two Aircraft Exists When:

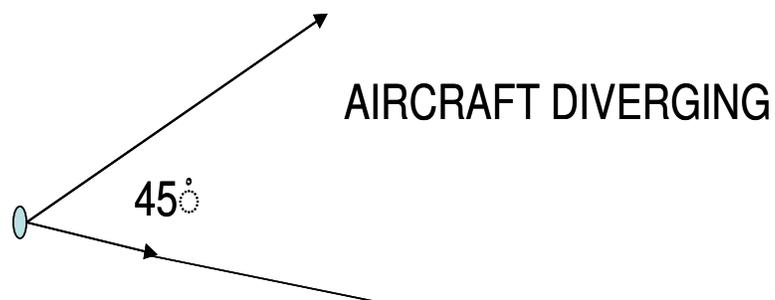
A Using a VOR/DME-Both aircraft must have reported established on radials at least 20 degrees apart;



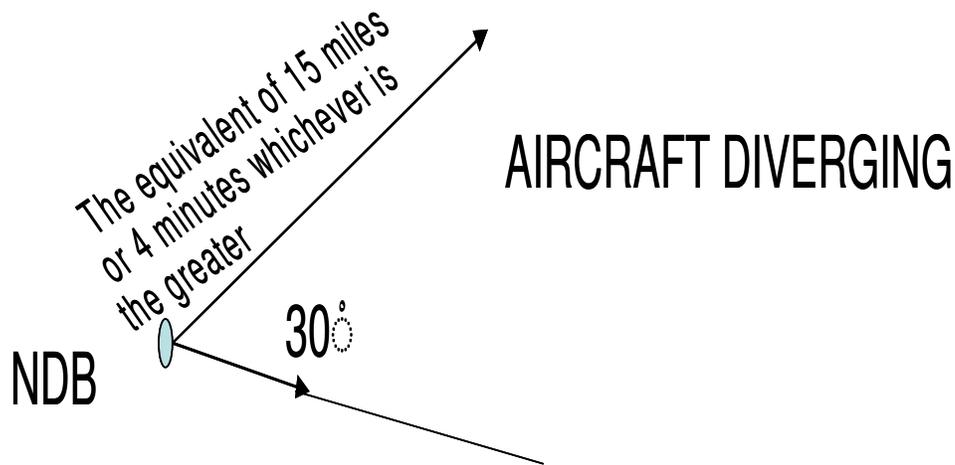
- B.** Using VOR radials; when one aircraft is a time equivalent of 15 miles or 4 minutes (whichever is greater) from the VOR and both aircraft have reported established on radials which diverge by 20° or more;



- C** Using VOR radials; both aircraft must have phased a VOR on tracks diverging by 45° or more and have reported established on the relevant radials;



D Using specified tracks from an NDB; when one aircraft is the time equivalent of 15 miles or 4 minutes (whichever is greater) from an NDB and both aircraft have reported established on tracks diverge by 30° or more



NOTE: If a pilot reports that he suspects the accuracy of the NDB indications, this separation shall not be used.

3.10 Longitudinal Separation

Longitudinal separation shall be applied so that the spacing between the estimated positions of the aircraft being separated is never less than a prescribed minimum

Longitudinal separation may be established by requiring aircraft to:

- a. Depart at a specified time;
- b. Arrive over a geographical location at a specified time; or
- c. Hold over geographical location until a specified time.

For the purpose of application of longitudinal separation, the terms below shall have the following meanings:

a. Same Track

Same direction track and intersecting tracks or portions thereof, the angular difference of which is less than 45 degrees or more than 315 degrees, and whose protected airspace overlap.

b. Reciprocal Tracks

Opposite tracks and intersecting tracks or portions thereof, the angular difference of which is more than 135 degrees but less than 225 degrees, and whose protected airspace overlap

c. Crossing Tracks

Intersecting tracks or portions thereof other than those specified in A) and B) above.

3.11 Time-Based Separation Minima

Separation minima based on time are specified in the Table 3.1 below:

Table 3.1 – Time-Based Separation Minima

Aircraft En-Route	Minimum Separation	Provision
Same cruising level and same track	20 minutes	If navigation aid permit frequent determination of position and speed
	5 minutes	Provided the preceding aircraft is maintaining a true airspeed of 20 knots or more faster than the succeeding aircraft
	3 minutes	Provided the preceding aircraft is maintaining a true airspeed of 40 knots or more faster than the succeeding aircraft
Crossing track same level	10 minutes	If navigation and permit frequent determination of position and speed
Climbing and descending	10 minutes	While vertical separation does not exist, provided that such separation is authorized only where navigation aids permit frequent determination of position and speed
	5 minutes at time levels are crossed	Provided that the level change is commenced within 10 minutes of the time the second aircraft has reported over the same exact reporting point
Reciprocal Tracks	10 minutes prior to and the estimated passing time	Vertical separation shall be provided for at least 10 minutes prior to and after the estimated time of passing unless it is confirmed that the aircraft have actually passed each other by: <ol style="list-style-type: none"> 1. A visual sighting report from both pilots (by and only), or 2. Aircraft position reports over the same exact reporting point; provided vertical separation is maintained for sufficient time to take into consideration possible navigation errors

NOTE: This separation should be based on the actual aircraft position reports; forward estimates are not sufficiently reliable.

3.12 Distance-Based Separation Minima

When using DME separation shall be established by maintaining not less than the distance specified in the table below between aircraft positions as reported by reference to the same “on track”

Table 3.2 – Distance-Based Separation Minima

	Minimum separation	Provisions
	5 minutes	Provided that the 5 minutes separation will be maintained or increased while vertical separation does not exist 1. If a departing aircraft will be flown through the level of a preceding departing aircraft and both aircraft propose to follow the same track

3.13 En-Route and Departing Aircraft

The minimum longitudinal separation between an en-route aircraft and a departing aircraft shall be 10 minutes. This may be reduced to 5 minutes provided that:

- a. The en-route aircraft is maintaining a true airspeed of 20 knots or more faster than the departing aircraft;
- b. The en-route aircraft has reported over an exact reporting point at which the departing aircraft will report;
- c. The departing aircraft is given positive instructions to arrive at the same exact reporting point 5 minutes behind the en-route aircraft.
- d. En-route aircraft are within 5 minutes flying time of the holding area.

3.14 Departing Aircraft

Separation between departing aircraft shall be applied so that after one aircraft takes off the next succeeding aircraft does not take off within less than the number of minutes specified in the table below. The minima in the table are complementary to the en-route longitudinal separations based on time. Greater minima than those listed in Tables 3.3 and 3.4 on the following page below may be required for vortex wake spacing purposes.

Table 3.3 – Separation Minima for Departing Aircraft

Minima Separation	Provisions
1 minute	<p>Provided that the aircraft fly on tracks diverging by 45 ° or more immediately after take off.</p> <p>The minimum may be reduced when aircraft are taking off from parallel runways provided the procedures have been approved by the appropriate authority</p>
2 minutes	<p>Provided that the preceding aircraft is 40 KT or more faster than the following aircraft and both aircraft will follow the same the same track</p>

Table YY below shows the Longitudinal Separation based on distance for aircraft which are within 15 miles from the overhead of the facility.

Table 3.4 – Longitudinal separation for aircraft within 15 miles from the overhead of the facility.

Aircraft En-route	Minimum Separation	Provision
Same cruising level and same track	10 miles	Provided the leading aircraft maintains a true airspeed of 20KT or more faster than succeeding aircraft and both aircraft utilizes the same “on-track” DME station
	20 miles	Provided each aircraft utilizes the same “on track” DME station
Climbing or descending on the same track	10 miles	Provided each aircraft utilizes “on track” DME stations and one aircraft maintains a level while vertical separation does not exist
Reciprocal tracks	10 miles	Provided that it has been positively established that the aircraft have passed each other and are at least 10 mile apart

3.15 Aircraft Holding

When aircraft are being held in flight, except when lateral separation exists, the appropriate vertical separation shall be provided between holding and en-route aircraft while such aircraft is within 15 miles from the overhead of the facility.

3.16 Wake Turbulence Longitudinal Separation Minima

The spacing between aircraft, determined either by time or distance, is to be applied so that aircraft of a lower weight category do not fly through the wake of an aircraft of a higher category within the area of maximum vortices. Where minimum separation between IFR flights is greater than the wake turbulence separation minima, then the IFR minima shall be applied.

All aircraft generate vortices at the wing tips as a consequence of producing lift. The heavier the aircraft and the slower it is flying, the stronger the vortex. Vortices are especially persistent in calm conditions.

Hazardous wake vortices begin to be generated by fixed-wing aircraft when the nose-wheel lifts off the runway on take-off and continues until the nose-wheel touches down on landing.

When helicopters are in forward flight the downwash from the main rotor(s) is(are) transformed into a pair of trailing vortices similar to the wing tip vortices of a fixed-wing aircraft. There is some evidence that these vortices are more intense than for comparable fixed wing aircraft. When the helicopter weight is transferred from the landing gear to the rotor, a strong downwash is created in all directions, although this can be moved by the wind.

3.16.1 Arriving Flights

The ATC unit concerned shall not be required to apply wake turbulence separation:

- (a) For arriving, VFR flights landing on the same runway as a preceding landing heavy or medium aircraft; and
- (b) Between arriving IFR flights executing visual approach when the arriving aircraft has reported the preceding aircraft insight and has been instructed to follow and maintain own separation from that aircraft

3.17 Aerodrome Operations

The minimum spacing listed below is to be applied between successive aircraft, both IFR and VFR flights.

- a. Aircraft departing from the same runway or from parallel runways less than 760 meters apart (including grass strips)

Leading Aircraft	Following Aircraft		Minimum Spacing at Time Aircraft are Airborne
Heavy	Medium light	Departing from the same take off position	2 minutes
Medium	Light	Departing from the take-off position	2 minutes
Heavy full length take-off	Medium light	Departing from an intermediate take-off point	3 minutes
Medium	Light	Departing from an intermediate take-off point	3 minutes

- b. Operations on a runway with a displaced landing threshold if the projected flight paths are expected to cross

Leading Aircraft	Following Aircraft		Minimum Spacing at Time Aircraft are Airborne or have touched down
Heavy Arrival	Medium light	Departure	2 minutes
Heavy Departure	Medium Light	Arrival	2 minutes
Medium Arrival	light	Departure	2 minutes
Medium Departure	Light	Arrival	2 minutes

3.17.1 Opposite Direction Runway Operations

A minimum of two minutes shall be applied between a light, small or medium aircraft and a heavy aircraft and between a light aircraft and a small or medium aircraft when the heavier aircraft is making a low or missed approach and the lighter aircraft is

- a. Utilizing an opposite direction runway for take-off, or
- b. Landing on the same runway in the opposite direction, or
- c. Landing on a parallel opposite direction runway separated by less than 760 meters.

CHAPTER 4. CONTROL OF TRAFFIC

4.1 Air Traffic Control Clearances

An air traffic control clearance is an authorization for an aircraft to proceed under conditions specified by an air traffic control unit. Clearance shall be obtained prior to operating a controlled flight or portion of a flight as a control flight.

Clearance shall be requested through the submission of a flight plan to an air traffic control unit.

4.2 Contents of Clearances

Clearances shall contain positive data concise and shall, as far as practicable, be phrased in a standard manner. They shall include the following items:

- a. Aircraft identification
- b. Clearance limit
- c. Route
- d. Level of flight and changes of levels
- e. Any necessary instructions or information

4.2.1 Clearance Limit

A clearance limit shall be described by specifying the name of:

- a. An appropriate significant point and aerodrome, or
- b. An aerodrome, or
- c. A controlled airspace boundary.

An aircraft shall be cleared for the entire route to the aerodrome of first intended landing when:

- a. It is been possible, prior to departure, to coordinate the clearance between all the unit under whose control the aircraft will come,
- b. There is reasonable assurance that prior coordination will be affected between those units under whose control the aircraft will come.

The clearance limit for all other flights shall be the boundary of control or advisory airspace.

4.2.2 Route

The route of the flight shall be detailed in each clearance when deemed necessary. The phrase "clear via flight planned route" may be used to describe any route or portion there of filed in the flight plan.

The phrase "clear via flight planned route" when granting a re-clearance.

4.2.3 Level

Aircraft authorized to employ cruise climb techniques shall be cleared to operate between two levels or above a level.

When two or more aircraft are at the same cruising level, the preceding aircraft shall normally have priority.

4.3 Amendments to clearances

When an amendment is made to a clearance, the new clearance shall be read in full to the pilot and shall automatically cancel any previous clearance.

4.3.1 Read back of clearance

The flight crew shall read back to the air traffic controller safety-related parts of ATC clearances which are transmitted by voice. The following items shall always be read back:

- a. ATC route clearances;
- b. Clearances and instructions to enter, land on, take off on, hold short of, cross taxi and back track on any runway; and
- c. Runway-in-use, altimeter setting, SSR codes, level instructions, heading and speed instructions and, whether issued by controller, transition levels.

CHAPTER 5. ALTIMETER SETTING AND UNITS OF PRESSURE

Hectopascals (HPA) are the notified units for the measurement of pressure for flying within Roberts FIR. Pilots are normally expected to carry out their own conversion from hectopascals to inches if this is necessary and controllers will only provide pressure settings in inches when specifically requested by an individual aircraft.

5.1 System of Flight Levels

Flight level zero is at the 1013.2 HPA pressure level and consecutive flight levels are at intervals of 500 feet up to FL 250 and 1000 feet above FL 250.

Flight levels are numbered according to height in the atmosphere; for example, at FL 35 the altimeter indicates 3500 feet and at FL 220 in indicates 22000 feet

5.2 Pressure Setting

A correctly calibrated pressure altimeter when set to :

- a. QNH altimeter setting will indicate altitude,
- b. QFE altimeter setting will indicate height above the reference datum.

Both of these settings are rounded down to the nearest whole hectopascal before being passed to the pilot. However, they are given to the nearest tenth of a hectopascal if requested.

5.2.1 Regional Pressure Setting

The regional pressure setting is a forecast of the lowest QNH value within an altimeter setting region. The value which are made available hourly for the period H + 1 to H + 2 are given in whole hectopascal.

Air traffic services units are to have available the regional pressure setting for the altimeter setting region in which they are situated and appropriate adjacent regions. These values are to be passed to pilots when requested or at the discretion of the controller. However, a pressure setting shall not be volunteered if the controller is uncertain that it is appropriate to the flight.

5.3 Transition Altitude

Transition altitude is the altitude at or below which the vertical position of an aircraft is normally controlled by reference to altitude. Wherever possible there is a common transition altitude for aerodromes within a control zone. Unless otherwise notified the transition altitude for civil aerodrome is 3000 feet.

5.4 Transition Level

Transition level is the lowest flight level available for use above the transition altitude. It is determined as follows:

- a. Within controlled airspace by the controlling authority and it will normally be based on the QNH of the major aerodrome;
- b. Outside controlled airspace by the aerodrome authority and based on the aerodrome QNH.

Transition level is the airspace between the transition altitude and transition level.

5.5 Vertical Position

A pilot normally assesses the height of his aircraft above obstacle by using an accurately set altimeter. It is imperative, therefore, that controllers always issue the correct pressure setting and that they check the read-back from the pilot.

When transmitting altimeter pressure settings, which are lower than 1000HPA, controllers are to specify clearly the unit of measurement on the first transmission of the information to each aircraft and pay particular attention to the read-back to ensure that the correct setting has been understood by the pilot.

The table below shows the altimeter subscale setting, the term in which vertical position is reported and the occasions on which they are used to report to air traffic services units.

Subscale Setting	Expressed In terms Of	When Used To Report Vertical Position To ATSMS
1013.2HPC	FLIGHT LEVEL	<ol style="list-style-type: none"> 1) At, or above, the transition level 2) Climbing through the transition layer 3) Above 3000 feet AMSL and not in the vicinity of an aerodrome
QNH	ALTITUDE	<ol style="list-style-type: none"> 1) At, or below the transition altitude(i.e in the vicinity of an aerodrome) 2) Descending through the transition layer. 3) At the pilots discretion during final approach
QFE	HEIGHT	Normally during final approach
REGIONAL PRESSURE SETTING	ALTITUDE	At, or below 300 feet AMSL when outside controlled airspace and not in the vicinity of an aerodrome

NOTE:

When an aircraft has been cleared to climb from an altitude to a flight level, vertical position will be reported in terms of flight level unless intermediate altitude reports have been specifically requested by ATC. Similarly when a pilot is descending from a flight level to an altitude, the pilot will change to the aerodrome QNH unless further flight level vacating reports have been requested by ATC, in which case the QNH will be set following the final flight level vacating report.

5.6 Procedures at Aerodromes

5.6.1 Aerodromes Reference Data

Aerodrome elevation is the elevation of the highest point on the landing area. It is the elevation upon which the height for visual maneuvering (circling) is based. In addition a threshold elevation is published for each runway.

The pressure settings associated with aerodrome and threshold elevation are expressed as QFE aerodrome and QFE threshold respectively.

5.6.2 Aircraft Taking Off

Prior to taking off, aircraft are to be given aerodrome QNH. The transition altitude and level will only be passed if requested by the pilot.

5.6.3 Arriving Aircraft

Aircraft at or below the transition level are to be given the aerodrome QNH.

When an aircraft is cleared to descend from flight level to an altitude the appropriate QNH shall be included in the same transmission. If flight level vacating reports are required the request should be included with the descent clearance. Transition level is passed to aircraft only if requested.

After QNH is assumed to have been set by an aircraft all reference to vertical position shall be in terms of altitude until the aircraft commences final approach. Vacating reports, which have not been requested at the time of the descent clearance, may be in terms of altitude, particularly if the aircraft has only one altimeter.

Aircraft are to be given the QFE at a convenient time before commencing final approach or joining a visual circuit with the intention of landing. Controllers are to pass the QFE aerodrome unless the aircraft intends to land on an instrument runway with a threshold elevation 7 feet or more below aerodrome elevation. In this case the QFE threshold is to be given.

If it is known that a particular company uses, or a pilot has clearly indicated that he will use, QNH during the final approach the controller may omit QFE and substitute QNH and elevation in appropriate messages.

After a missed approach, vertical position is referred to in terms of altitude, it may be necessary, therefore, to include QNH with the subsequent clearance.

5.6.4 Visual Maneuvering (Circling)

If an aircraft makes an instrument approach, which is to be followed by a visual maneuver (circling) to land on another runway, the QFE aerodrome shall be provided.

If appropriate, following the visual maneuver, the QFE threshold for the landing runway is to be given.

5.6.5 Determination of the Lowest Cruising Levels

Cruising levels on airways and advisory routes are notified in the ROBERTS FIR. Due to variation of atmospheric pressure the lower flight levels will not always be available.

The lower cruising level available for assignment shall be determined at the ACC using the appropriate regional pressure setting. On an airway this must always be at least 500 feet above the notified base.

On advisory route, which exist above and below an altitude of 3000 feet, the lowest flight level assigned as a cruising level must be vertically separated from aircraft participating in the advisory service at or below an altitude of 3000 feet.

5.6.6 Use of Levels by Controllers

Except when aircraft are leaving controlled airspace by descent, controllers should not normally allocate a level to an aircraft, which provides less than 500 feet vertical separation above the base of a control area or airway. This will provide some vertical separation from aircraft operating beneath the base of controlled airspace. Similarly controllers should exercise caution when operating close to the upper vertical limit of a control zone or area where it is not contiguous with further controlled airspace.

CHAPTER 6. DIVERSION PROCEDURE

Aircraft may divert from their planned destination to another aerodrome on the initiative of the pilot or request from the appropriate authority on the ground.

Diversions will normally be made for the following reasons:

- a) When the weather at the planned destination is reported to be below the minima prescribed by an operating company for their aircraft.
- b) When obstructions on the landing area, which constitute a hazard to aircraft landing, cannot be cleared within a reasonable period.
- c) The failure of airborne equipment
- d) The failure of essential ground aids to landing in circumstance, which would require their use.
- e) Unacceptable delay due to congestion of air traffic
- f) The closure of the aerodrome of destination.

The aerodrome authority is responsible for decisions regarding the availability of the aerodrome.

6.1 Diversions originated by the Pilot

The pilot of an aircraft is primarily responsible for its safety, therefore he will normally decide whether he can or cannot effect a safe landing at a given aerodrome. He will normally be aware of weather conditions at the planned destination and alternate aerodrome, thus whenever he considers a diversion to be necessary, he will make his intention known to an air traffic control unit and request further clearance. His decision will normally be in accordance with the minima prescribed by his company.

The specifically requested by the pilot that his company or a nominated addressee be advised of his diversion the controller is to pass this message to the air traffic service unit at either:

- a) The original destination, or
- b) The aerodrome nearest to the original destination

An air traffic service unit receiving such a message is to pass it to the addressee.

6.2 Diversions Originated by the Ground Organization

When, for traffic reasons, a controller considers it advisable to divert an aircraft he shall consult the aircraft operator. The controller and the aircraft operator shall decide between them the diversion aerodrome. The request to divert shall be passed to the pilot together with reasons for diversion, an air traffic control clearance and any further instructions.

In cases of emergency it may be necessary for an aircraft to be diverted without prior consultation with the aircraft operator. In this event, the controller shall pass the message to the pilot expressed as a request and inform the aircraft operator as soon as possible. When the operator of the aircraft is not known, the pilot is to be asked to nominate an addressee.

6.3 Action by Pilot

On receipt of the diversion message the pilot will acknowledge and comply with the request or give his reason for non-compliance. If he decides against diversion, permission to attempt a landing shall not be refused unless the aerodrome has been closed by the aerodrome authority.

SECTION III.
AERODROME CONTROL SERVICES

CHAPTER 1. AERODROME CONTROL

1.1 Provision of Services

An aerodrome control unit shall provide:

- a.** Aerodrome Control Service
- b.** Flight Information Service
- c.** Alerting Service

An aerodrome control unit provides services principally to aircraft flying with visual reference to the surface in, and in the vicinity of, the aerodrome traffic zone and operating on the maneuvering area. It is normally a separate unit but may be combined, either temporarily or permanently, with an approach control unit.

An aerodrome controller shall not provide approach control services whilst engaged on aerodrome control duties.

1.2 Responsibilities

Aerodrome control is responsible for issuing information and instructions to aircraft under its control to achieve a safe, orderly and expeditious flow of air traffic and to assist pilot in preventing collision between:

- a)** Aircraft flying in and in the vicinity of the aerodrome traffic zone;
- b)** Aircraft taking off and landing;
- c)** Aircraft and vehicles, obstructions and other aircraft on the maneuvering area and aircraft moving on the apron.

Aerodrome control may be divided into air control and ground movement control.

Air control shall provide services for (a) and (b) and has the absolute authority over all movements on active runways and their access points.

Ground movement control shall provide services for (c) except on active runways and their access points.

1.2.1 Specific Responsibilities

In addition, aerodrome control has the following specific responsibilities:

- a)** Alerting the safety services;
- b)** Informing aircraft under its control of any depletion of the aerodrome emergency services;
- c)** Providing an approach control service when carrying out functions delegated by approach control;
- d)** Supplying the following information to approach control and, according to unit instructions;

1. Pertinent data on IFR, special VFR and VFR traffic including departures, missed approaches and over due aircraft,
 2. Appropriate items of essential aerodrome information - Informing the aerodrome authority when it becomes apparent that there is a deterioration in the state of the aerodrome or associated facilities for which the aerodrome authority is responsible.
- e) Initiating overdue action at aerodrome where no approach control unit is established.

Approach control may instruct approaching IFR flights to contact aerodrome control before transfer of control has become effective. Until approaching aircraft is flying with visual reference to the surface, aerodrome control shall not issue any instructions or advise which would reduce the separation established by approach control.

1.3 Coordination

Aerodrome control shall coordinate with approach control:

- a) Departing IFR traffic;
- b) Arriving aircraft which make their first call on the tower frequency (unless they are transferred to approach control).

Approach control will coordinate with aerodrome control:

- a) Aircraft approaching to land; if necessary requesting landing clearance;
- b) Arriving aircraft which are to be cleared to visual holding points;
- c) Aircraft routing through the traffic circuit, approach control may delegate the responsibility for coordination to aerodrome control. Aerodrome control shall coordinate with adjacent aerodromes to ensure that the traffic circuits do not conflict.

1.4 Airspace Classification

In addition to responsibilities described above, controllers are to provide minimum services according to the classification of the air space within which the aerodrome and the associated aerodrome traffic zone is located.

1.5 Effect of Weather on Operations

Class A

At aerodromes situated in class A airspace, ATC will inform special VFR flights when the reported meteorological visibility is less than 10km. Pilots must be asked their intentions and if necessary, IFR clearances be obtained from approach control. Controllers should note that in such conditions, continued flight according to SVFR is permitted if the pilot is appropriately licensed.

Class D

ATC will advise pilots of fixed-wing aircraft intending to operate under VFR, inbound to or operating outbound from aerodromes in class D airspace, if the reported meteorological visibility reduces to less than 5000 meters and/or the cloud ceiling is less than 1500 feet. ATC will then take the following action:

- i) Request the pilot to specify the type of clearance required;
- ii) If necessary, obtain SVFR or IFR clearances from approach control.

Additionally, ATC will not issue any further VFR clearances to fixed wing aircraft wishing to enter the airspace for the purpose of taking off or landing at any airfield, situated within the Class D control zone, where the reported meteorological visibility is less than 5000 meters.

1.6 Light Signal and Pyrotechnics

Lights and pyrotechnic signals used to control aircraft and vehicles at aerodromes are to comply with these described in the rules of the air regulations.

1.7 Essential Aerodrome Information

Essential aerodrome information is that concerning the maneuvering area and its associated facilities, which may constitute a hazard to a particular aircraft. It shall be issued to pilots in sufficient time to ensure the safe operation of aircraft. This information shall include:

- a) Construction work or maintenance on the maneuvering area;
- b) Rough portions of the maneuvering area whether marked or not;
- c) Failure or irregular functioning of the aerodrome lighting system. Defects must be passed to pilots in the form that they have been reported to the controller. Controllers should not make the assumption that a particular defect renders an associated and unserviceable or not available. The pilot is responsible for deciding this course of action.
- d) Failure or irregular functioning of approach aid;
- e) Aircraft parked close to the runways or taxiways and aircraft engaged in ground running of engines;
- f) Bird formation or individual large reported or observed on or above the maneuvering or in the immediate vicinity of the aerodrome and the extent of any bird dispersal action being carried out (when flocks or birds or single large ones, are seen the aerodrome authority or bird control unit must be informed);
- g) Warnings of the presence of water on runways;
- h) Information on the location and operational status of any arrester gear installation.

1.8 Control of Surface Traffic

The movement of aircraft, persons or vehicles on the maneuvering area and the movement of aircraft on the apron are at all times subject to permission from aerodrome control.

Aerodrome control responsibility on the apron is limited to providing advice and instructions to assist the prevention of collisions between moving aircraft. The apron may be out of sight from some visual control rooms and in these circumstances any of the following procedures, adopted if necessary to suit local conditions may be used to control moving aircraft:

- a) An aircraft is cleared to taxi. A second aircraft may be given taxi clearance plus information on position and intention of the first aircraft, with clear instruction to 'follow' or 'Give Way' to it.
- b) An aircraft is cleared to taxi and all further requests for aircraft movement are refused until the first aircraft comes into sight of the controller. A second movement is then approved following the same procedures.
- c) Aircraft is cleared to taxi and asked to report when cleared of the apron or passing an easily identifiable reference point. A second movement may then be cleared subject to the known progress of the first.

Vehicles moving along a runway or taxiway shall keep to the left of the centerline of the runway or taxiway and give way at all times to aircraft taking off, landing or being towed. The phrase 'Give Way' must be used in Radiotelephone (RTF) phraseology to resolve conflicts between vehicles and aircraft on the maneuvering area.

1.9 Crossing Runways

If the instructions given to surface traffic involve crossing a runway in use, clearance to cross should normally be withheld until no conflict exists. However, to achieve greater efficiency of operation, clearance to cross may be given subject to aircraft, which are landing or taking off. The clearance shall contain sufficient information to enable the pilot of the taxiing aircraft or vehicle driver to identify the other traffic and should be related to one movement only. When a clearance to cross a runway in use is issued, a report of vacated instruction shall be included. However, this instruction may be omitted when aerodrome control has continuous sight of the aircraft or vehicle crossing.

1.9 Runway Occupancy

When aircraft, persons or vehicle have been given permission to cross or occupy a runway in use, the controller shall, as a positive reminder that the runway is blocked, display a strip(s) or marker(s) on the part of the flight progress board which is used to represent the runway. At units where flight progress boards are not used, such runway occupancy is to be down effectively by a suitable method similar to the above.

Vehicles fitted with appropriate equipment operating on an active runway (e.g. during runway inspection or short-term maintenance) are to be transferred to a RTF frequency which will enable them to hear transmissions to and from aircraft using that runway.

1.10 Low Visibility

In conditions of low visibility where non-radio equipped aircraft and vehicles cannot be controlled by light signals, the movement on the maneuvering area of all vehicles except those of the emergency services should normally be prohibited.

1.11 Traffic Lights

Traffic lights installed at aerodromes for the control of vehicles on the taxiway will be operated by aerodrome control or runway controller who will ensure that the red 'stop' signal is displayed in adequate time to enable drivers to observe and obey the instructions.

1.12 Surface Movement Radar

Surface movement radar may be used when traffic on the aerodrome cannot be adequately seen from the control tower during the periods of low visibility or during hours of darkness as follows:

- a) To monitor and assist departing and arriving traffic;
- b) To ensure that departing aircraft are lined up on the correct runway;
- c) To ensure that arriving aircraft have cleared the runway;
- d) To ascertain that aircraft have commenced take-off run;
- e) To monitor the positions of traffic in order to facilitate switching of taxiway lighting;
- f) To monitor and assist emergency service vehicles when required. Surface movement radar normally covers all runways and taxiways on the aerodrome. In the event of equipment failure, the controllers shall immediately advise all aircraft being assisted.

1.13 Taxiing Aircraft

When the pilot of any aircraft requests start-up or taxi clearance, the following information shall be given:

- Runway in use
- Surface wind direction and speed, including significant variations
- Aerodrome QNH
- Outside temperature (turbine-engine aircraft only)
- Significant meteorological conditions (e.g. RVR, marked temperature inversion).

Those items which are known to have been received by the pilot may be omitted.

1.13.1 Taxi Clearance

The importance of issuing clear and concise instructions to taxiing aircraft cannot be over emphasized. The visibility from an aircraft flight deck is limited and, when taxiing, the pilot is dependent to a large degree upon aerodrome control to assist him in determining the correct taxi route to be followed. Essential aerodrome information is to be passed to the pilot to assist him in preventing collisions with parked aircraft and obstructions on/or near the near the maneuvering area.

Heavy aircraft are not to be given clearance or instructions that would require the use of more than normal power for taxiing or for entry on to the runway. Heavy aircraft, when at the holding point, are not to be cleared for an immediate take off.

In the interests of safety, use of the active runway for taxiing purposes is to be kept to a minimum.

1.13.2 Clearance Limit

In addition to providing instructions about the route to be followed, all taxi clearances are to contain a specific clearance limit. This clearance limit should be a location on the maneuvering area or apron.

Care must be exercised when clearing an aircraft to the holding point of the runway in use, for aircraft is then permitted to cross all runways which intersect the taxi route designated in the clearance whether active or not. Should an aircraft be required to hold short of a particular runway, or stop on any part of the maneuvering area whilst enroute to the holding point, then an alternative clearance limit must be selected which will ensure that the aircraft complies with this requirement.

If an aircraft wishes to depart from an aerodrome in airspace where VFR flight is permitted, and the flight details are unknown, the pilot is to be asked 'are you departing VFR?'

1.14 *Awaiting Take-Off*

Aircraft shall not be permitted to hold on the end of the runway if another aircraft has been cleared to land. Aircraft will hold clear of the runway at the marked holding point or if one is not provided, not closer than 30 meters to the runway centerline. This minimum figure is increased for runways that exceed 800 meters in length.

When, after an aircraft has been instructed to hold and a clearance message is awaiting take-off, a clearance passed which might be misinterpreted as permission to take off, the instruction to hold should be repeated as part of the message.

1.14.1 Line up Clearance

Line up instructions may be issued to more than one aircraft at different points on the same or crossing runways provided that:

- a) It is during daylight hours;
- b) All aircraft are continuously visible to the aerodrome controller;
- c) All aircraft are on the same RTF frequency;
- d) Pilots are advised of the number of aircraft ahead in the departure sequence, and position/runway from which these aircraft will depart;
- e) The physical characteristics of the runway do not render preceding aircraft in the departure sequence invisible to succeeding aircraft on the same runway.

1.14.2 Take-Off Clearance

The aerodrome controller is responsible for issuing take-off clearance and advising pilots of any variation to the surface wind or other significant changes to meteorological conditions. When a pilot requests the instantaneous surface wind at aerodrome where the two-minute average is usually used, the word “instant” is to be inserted to indicate that the wind being reported is not the two-minute average.

Take off clearance may be issued when the aircraft is at the holding point for the runway in use or when the aircraft is lined up on the runway.

A departing aircraft shall not be given instructions, which would require it to make a turn before it has reached a height of 500 feet. This need not apply in the case of a light aircraft.

1.14.3 IFR Flight

An aircraft on an IFR flight is not to be given take-off clearance until:

- a) The ATC clearance from area control (if required) has been passed and acknowledged, and;
- b) Approach control have authorized its departure and any specific instructions have been passed to the aircraft, e.g.:
 - i. Turn after take off;
 - ii. Track to make good before turning onto desired heading;
 - iii. Level(s) to maintain before continuing to climb to assigned cruising level.

To avoid pilots taking off without take-off clearance, the phrase ‘after departure’ shall be used in airways or route clearances, when appropriate.

1.14.4 Expedition

When given the instruction ‘cleared for immediate take off’ it is expected that the pilot will act as follows:

- a) At the holding point, taxi immediately on to the runway and commence take off without stopping the aircraft.
(Not to be given to heavy aircraft)

- b) If already lined up on the runway, take off without delay.

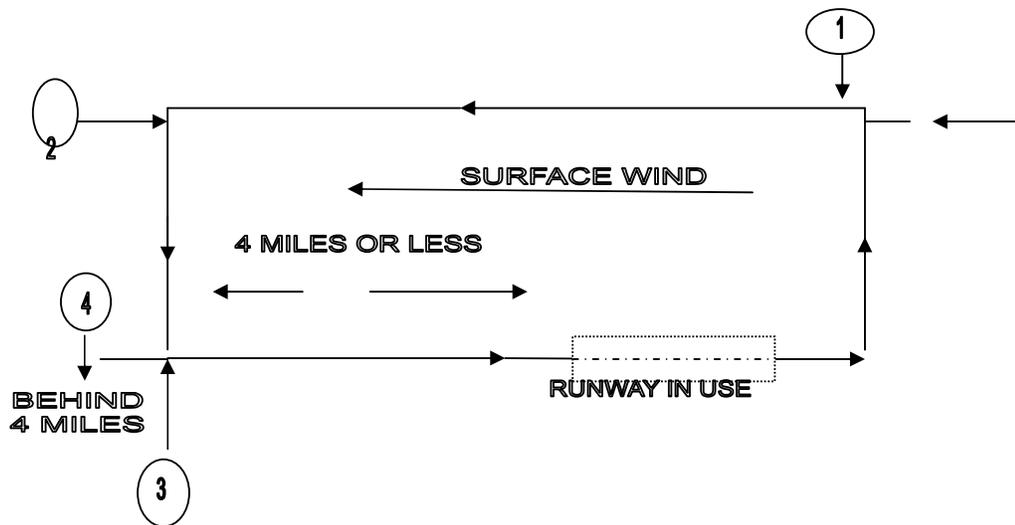
An aerodrome controller may, after coordination with approach control:

- a) Expedite departing aircraft by suggesting a take-off direction, which is not into wind. The pilot has the right to reject the suggestion.
- b) Reduce the overall delay to traffic by altering the order in which he clears aircraft to take off.
- c) When radar is not available, clear departing IFR flights to climb VMC and maintain their own separation until a specified time, location or level; if reports indicate that this is possible.

1.14.5 Turbulent Wake

The pilot of a departing aircraft may request a delay in take off because of the danger of turbulent wake from the preceding aircraft. There is a particular danger for aircraft commencing the take-off run part of the way along the runway.

1.14.6 Critical Positions in the Traffic Circuit



Typical Left-Hand Circuit

Position 1 – Aircraft reports on downwind leg when a bean upwind end of the runway

Position 2 – Base leg Report

Position 3 – ‘Final’ Report. Clearance to land issued here.

Position 4 – ‘Long Final’ Report (Between 8 and 4 miles) when aircraft is on a straight-in approach.

1.14.7 Arriving Aircraft

1.14.7.1 Joining Circuit

Clearance to enter a traffic circuit is issued when an aircraft is still some distance from the airfield to enable the pilot to conform with the traffic circuit, pending clearance to land. Information concerning landing direction or runway in use and any other necessary instruction(s) are given at the same time so that the pilot may intelligently position himself in the traffic pattern.

Aircraft may be cleared to position over head the aerodrome for a standard overhead join. In these circumstances the aircraft will report overhead at 2,000 feet above aerodrome elevation, subject to remaining in VMC, and when cleared to descend will route to the dead side of the circuit descending to circuit height. The aircraft will then cross the upwind end of the runway in use at circuit height, then position accordingly into the existing traffic pattern to report downwind.

Any variance on this procedure must be notified and the phraseology standard overhead join must not be used in such circumstances.

If an aircraft enters a traffic circuit without proper authorization, the possibility of an emergency must be recognized. The aircraft should be permitted to land if its action indicates that it wishes to do so, and, if necessary other aircraft are to be instructed to give way.

1.14.8 Landing

A landing aircraft will not be permitted to cross the beginning of the runway on its final approach until a preceding departing aircraft is airborne.

When pilot requests the instantaneous surface wind at aerodrome where the two minute average is normally used the word instant is to be inserted to indicate that the wind being reported is not the reported average.

A landing aircraft may be permitted to touch down before a preceding landing aircraft, which has landed, is clear of the runway provided that:

- a) The runway is long enough to allow safe separation between the two aircraft and there is no evidence to indicate that breaking may be adversely affected;
- b) It is during day light hours;
- c) The controller is satisfied that the landing aircraft will be able to see the preceding aircraft which has landed clearly and continuously, until it is clear of the runway; and
- d) The pilot of the following aircraft is warned (responsibility for ensuring adequate separation rests with the pilot of the following aircraft).

1.14.8 Exemption from Separation minimum in the Traffic Circuit

Aircraft in the traffic circuit shall be controlled in accordance with the procedures for take-off clearance and arriving aircraft except the controllers are not required to apply the separation minima described in those paragraphs to:

- a) Aircraft in formation with respect to other aircraft in the same formation;
- b) Aircraft operating in different areas or lanes on aerodromes equipped with runway suitable for simultaneous landing or take offs;
- c) Aircraft operating under military necessity as determined by the appropriate authority.

1.14.9 Missed Approached

If the runway in use is occupied by aircraft or vehicles, an approaching aircraft shall not be cleared to carry out a missed approach procedure which includes a descent below 400 feet above the threshold elevation. When missed approach instruction is restricted to 400 feet or above the pilot is to be informed of the aircraft or vehicles on the runway.

The runway in use shall be kept clear of aircraft and vehicles if an approaching aircraft is likely to descend below 400 feet above the threshold elevation.

1.15 Landing Direction and Runway in Use

The term “runway-in-use” is used to indicate the particular runway or landing direction selected by aerodrome control as the most suitable at any particular time. Normally, the runway-in-use will be that closely aligned to the surface wind direction. Variable the 2000 feet wind should be taken into account before selecting the runway-in-use.

When selecting the runway-in-use, aerodrome control shall take into consideration other factors such as traffic pattern, the length of runways or landing runs and the approach aids available. At certain aerodromes more than one runway may be in use at anyone time.

If the runway-in-use is not considered suitable for a particular operation, the pilot may request permission to use another. Permission may be deferred until the traffic situation permits the use of another runway and the expected delay shall be passed to the pilot.

1.15.1 Runway Changes

Should a change of runway be necessary aerodrome control, after consultation with approach control, shall inform the following:

- Aircraft under his control
- Aerodrome fire service
- Contractors working on the aerodrome who will be affected by the change
- Other agencies according to local instructions.

1.16 Closure or Restricted Operation of Aerodromes Responsibility of the Aerodrome Authority

The aerodrome authority is responsible for decisions regarding the operational status of the aerodrome including apron and maneuvering area in respect of:

- a) Routine operational limitations, e.g. runway maintenance;
- b) Unforeseen hazard to aircraft operations, e.g. deteriorating surface conditions, obstructions, etc. specifically the aerodrome authority will make decisions regarding:
 - i. the closure or reopening of the aerodrome
 - ii. the withdrawal or return to use of runways (taxiways) and associated lighting aids;
 - iii. the revision of declared distances;
 - iv. any marking required in connection with the above;
 - v. initiating NOTAM actions to promulgate changes in serviceability.

1.17 Responsibility of the Air Traffic Control Unit

The aerodrome authority shall be informed immediately it becomes apparent from reports or observations that there is a hazard to the movement of aircraft on the apron or maneuvering area.

The aerodrome authority may take some time to assess the situation. During this period, the controller is to decide the action to take according to the circumstances:

- a) Where an operational occurrence has resulted in an obstruction in the vicinity of the runway in use:
 - i. Withhold take off and landing clearance when the obstruction is within the cleared and graded area of the runway.
 - ii. Withhold take off and landing clearance if there is any doubt as to the position of the obstruction.
- b) When the obstruction is obviously outside the cleared and graded area but on or in the vicinity of the apron or maneuvering area, the pilot will be advised of the position and nature of the obstruction. It is the responsibility of the pilot to decide whether or not to continue operations.

When the aerodrome authority has decided the operational status of the apron or maneuvering area, it will inform the air traffic control unit. The parent ACC should be informed of any situations, which may restrict operations at the aerodrome.

1.18 Availability of Aerodrome Service outside Published Hours

To cover the possibility of an aircraft, which departs 15 minutes of normal aerodrome closing time having to return, the aerodrome authority will normally retain sufficient services and equipment for 15 minutes after the Actual Time of Departure (ATD). If the aerodrome authority informs the air traffic control unit of a change in the extent of the services or equipment which will be available during this period, the pilot should be advised accordingly.

Availability of aerodromes for special flights application for the use of an aerodrome for special or pleasure flights shall be referred to the aerodrome authority.

1.19 Work on the Maneuvering Area

When repair or installation, authorized by the aerodrome authority, is to take place on the maneuvering area, a representative of the working party must be briefed by the air traffic control about subjects relating to the proposed work, for example:

Method of access to working area
The area in which vehicles may operate;
The runway in use and the effects of any changes.

1.19.1 Methods of obtaining permission to cross the runway-in-use, signals or method or indicating that vehicles and personnel must leave the maneuvering area.

The representative of the working party should process an authorization to work on the aerodrome issued by the aerodrome authority. This is to be countersigned by the senior controller, subsequent to the briefing, and a copy retained, or a record of the briefing entered in the ATC watch log book.

1.20 Ground Signals and Markings

The signal to be displayed in the signal square or elsewhere on the maneuvering area of an aerodrome ACC to comply with those described in the air regulations.

1.21 Close of Watch

At aerodrome where the hours of work are limited, the landing "T" is to be withdrawn from the signals area and runways at the close of watch.

1.22 Aerodrome Inspections

If special arrangements have been made for aerodrome inspections to be carried out by the air traffic control unit, they should be conducted according to instructions specified by the SATCO.

1.23 Inspection of Runways

Following accident or suspected incident, on the runway involving tire failure, aircraft structural failure or in the case of turbine engine D aircraft, engine malfunction, the runway is to be inspected before any other aircraft are allowed to use it.

Runway inspections are to be arranged through the aerodrome authority at the aerodrome where the air traffic control is not responsible for runway surface inspections.

CHAPTER 2. AERODROME LIGHTING AIDS

2.1 *Lighting systems in use at Liberia aerodromes*

The requirements for airport lighting at aerodromes in Liberia appear in the RFIR AIP. The particular system in use at an airport is published in the aerodrome (AD) section of the RFIR AIP.

Operation of lighting systems and intensity controls operating instructions for individual lighting systems, and the intensity setting to be used in different weather condition, settings may be varied at the controller's discretion or at the request of a pilot, provided that other aircraft will not be adversely affected.

A general description of intensity settings to be used when RVR operations are in force is contained in approach services.

At certain aerodromes where RVR reference lights are in use, the runway lighting may be temporarily switched off if this will facilitate an accurate count of the reference lights for RVR purposes. This shall not be done either:

- a) While an aircraft is taxiing off;
- b) After an aircraft has reported completing a final procedure turn; or
- c) After an aircraft has reached 5 miles from touch down on a radar approach.

2.1.1 **Period of Display**

Aerodrome lighting system shall be displayed from 15 minutes before any ETA and until 15 minutes after any ATD as follows:

- i. **By Day:** High intensity systems, where installed on the runway to be used, whenever the visibility is less than 5 km and/or the cloud base is less than 700 feet.
- ii. **By Night:** Respective of weather conditions.

Systems incorporating sodium lamps require 10 to 15 minutes to reach full brilliancy and should therefore be switch on 30 minutes before any ETA.

Although low intensity is designed primarily for night use, it should be used by day when it is the only lighting provided for a particular landing direction.

Obstruction lighting, hazard beacons, and aerodrome light beacons shall be displayed at night during the published hour of watch. Hazard beacons shall also be displayed by day whenever the visibility is less than 3500 meters.

When the actual time of departure of an aircraft is such that lighting will be displayed after aerodrome closing time, the pilot concerned should be warned that the aerodrome will at the normal published time (which should be stated), and advised that lighting only will be displayed for 15 minutes after his departure. The availability of other aerodrome services, e.g. the aerodrome fire service,

Manual of Standards ATM

approach aids, etc. During this 15 minutes period should also be stated.

In addition to the display period shown above lighting may be displayed at any other time if is requested by the parent ACC or considered necessary by the aerodrome.

CHAPTER 3. LIGHT GUN SIGNAL

Table 3.1 – Air Traffic Control Light Gun Signal

<i>MEANING</i>			
COLOR AND TYPE OF SIGNAL	MOVEMENT OF VEHICLES AND EQUIPMENT AND PERSONNEL	AIRCRAFT ON THE GROUND	AIRCRAFT IN FLIGHT
Steady Green	Cleared to cross, proceed or go	Clear for take off	Clear to land
Flashing Green	Not applicable	Clear for taxi	Return for landing (to be followed by steady green at the proper time)
Steady Red	STOP	STOP	Give way to other aircraft and continue circling
Flashing Red	Clear of taxiway/runway	Taxi clear of the runway in use	Airport unsafe, do not land
Flashing White	Return to starting point on airport	Return to starting point on airport	Not applicable
Alternating Red	Exercise extreme caution	Exercise extreme caution	Exercise extreme caution

CHAPTER 4. WIND SHEAR

Wind shear is a sustained change in the wind velocity along the aircraft path, which occurs significantly faster than the aircraft can accelerate or decelerate.

Wind shear can occur at any level, but it is 'low level wind shear' occurring from the surface to a height of approximately 1500 feet, which can cause problems of sufficient magnitude to affect the control of aircraft in departure or final approach phases of the flight.

4.1 *Conditions Conducive To Wind Shear*

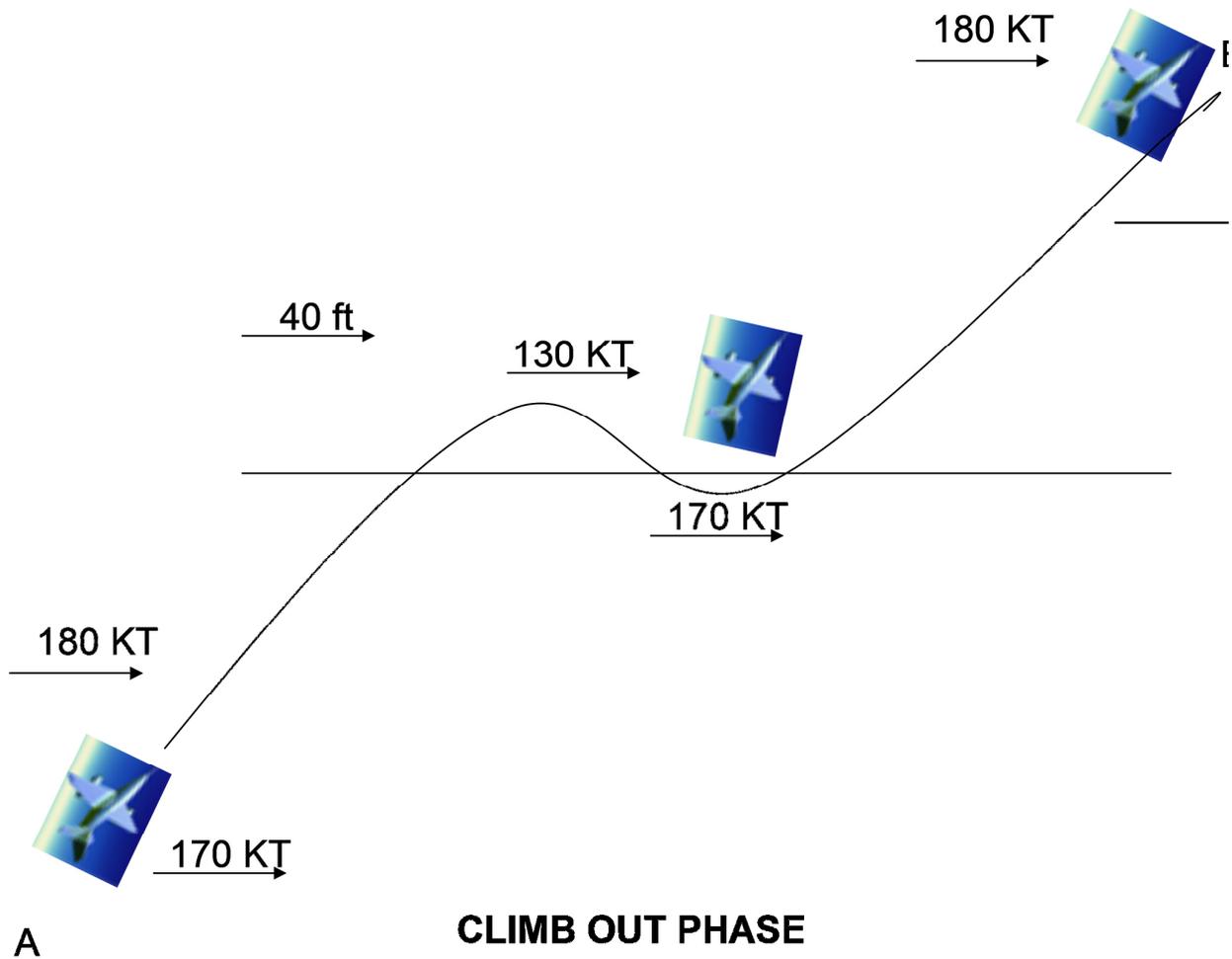
Controllers should be alerted to the possibility of the existence of wind shear in the following circumstances:

- A.** The presence of frontal/squall/thunderstorm activity in the vicinity of the airfield,
- B.** The presence of low level inversions where the surface wind will be significantly differently from that at only a few hundred feet above the ground,
- C.** Local terrain or building considered in relation to wind speed and direction; such large obstructions can cause wind shear as well as the more usual turbulence and gusts.

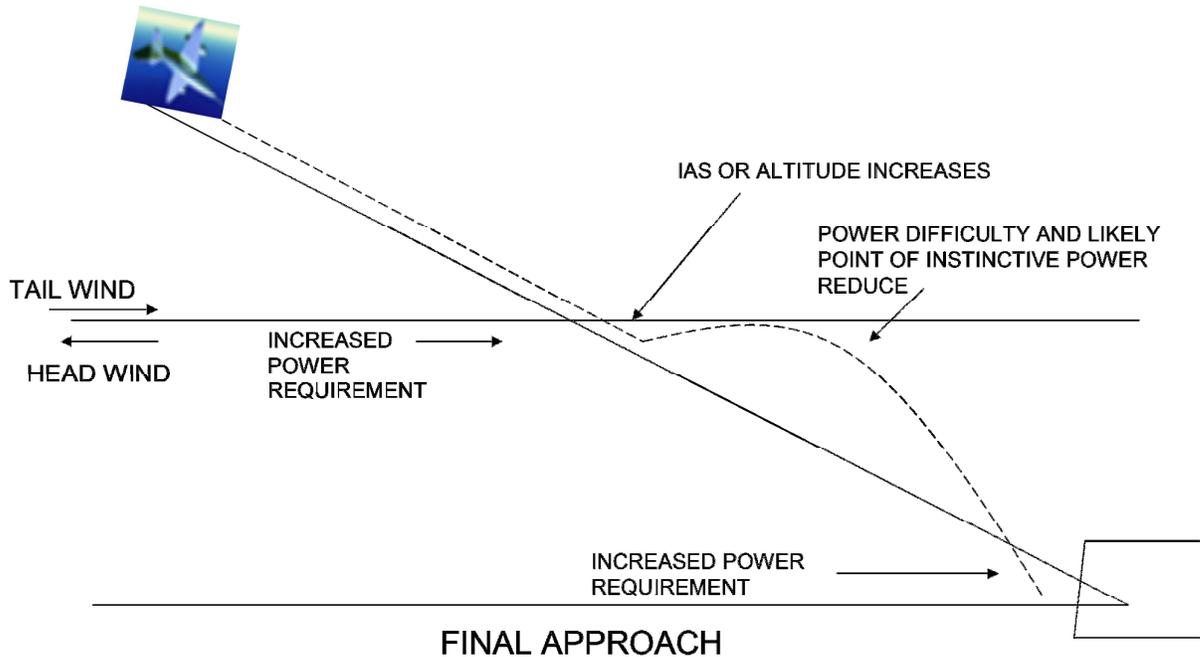
4.1.1 Effect of Wind Shear

A combination of factors can make the analysis of wind shear very complex, but three simple examples of the hazards of low-level wind shear are shown below:

1. As the aircraft flies from A to B and transverse the wind shear line, the inertia of the aircraft maintains the ground speed of 170 KT and the change of wind vector causes a sudden fall in air speed. This can result in reduced lift until the inertia of the aircraft has been overcome and the original air speed regained clearly this may be hazardous at critical climb out speeds.



2. If an aircraft on final approach passes through a wind shear line which causes a sudden loss of airspeed and a consequent increase in the rate of descent, a rapid application of power will be required if the aircraft is not to sink at a dangerously low height.



3. If the aircraft passes through a winds hear line from a tailwind to a headwind component the inertia of the aircraft results initially in an increased air speed and a deviation above the glide path. The pilot's instinctive power reduction can result in the aircraft being short of power with a high rate of descent as the glide path is approached and the effect of the inertia is lost. A rapid increased of power is now required if the aircraft is not to sink below the glide path at a dangerously low altitude.

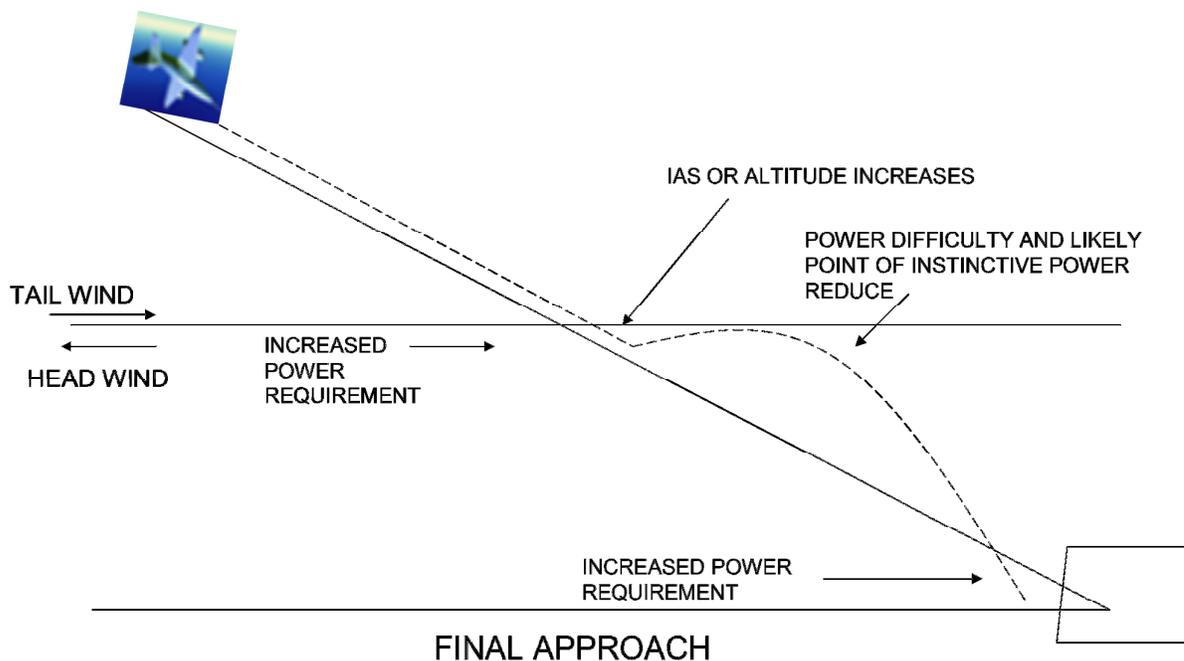
Due to the need to maintain a safe margin above the stalling speed and a clearly defined flight profile, particularly during the climb out and approach phases of flight, sudden changes in airspeed must be countered very rapidly in order to assist pilots in these circumstances, controllers will take the following action.

ATC Action

Whenever a pilot reports wind shear conditions to ATC, the information will be relayed to subsequent inbound and outbound aircraft until confirmation is received that the condition no longer exists.

Reports from pilots should contain the following information:

- a. A warning of the presence of wind shear
- b. The height or height band where the shear was encountered
- c. The time at which it was encountered
- d. Details of the effect of the wind shear on the aircraft, e.g. speed gain or loss, vertical speed tendency, change in drift.



4.2 APPROACH CONTROL

An approach control unit shall provide:

- a) Approach control service with or without the aid of radar
- b) Flight Information service
- c) Alerting service

An approach control unit may be combined with an aerodrome control unit.

SECTION IV.
APPROACH CONTROL SERVICES

CHAPTER 1. APPROACH CONTROL

Approach control unit may share the function with the area control unit.

1.1 Within Controlled Airspace

An air traffic control unit at an aerodrome within controlled airspace (class A to E airspace) shall provide approach control services to aircraft, according to the classification of the airspace within which the aerodrome is located, from the point, level or time which:

- a) Arriving aircraft are released by area control until control is transferred to aerodrome control;
- b) Aircraft approaching from outside controlled airspace under the control of approach control until control is transferred to aerodrome control;
- c) Departing aircraft are taken over from aerodrome control until:
 - i. they are transferred to area control of
 - ii. they are clear of controlled airspace and separated from other FIR flight in receipt of an approach control service from that unit;
- d) Over-flying aircraft are within the relevant controlled airspace

Approach control shall provide standard separation between special VFR and IFR flights and between special VFR flights unless the authority has approved a reduced separation.

1.2 Outside Controlled Airspace

An air traffic control unit at an aerodrome outside controlled airspace (Class F and G airspace) shall provide approach control services to aircraft, as determined by the aerodrome operator and approved by the authority, from the flight, level and time at which:

- a) Arriving aircraft under the control of approach control until control is transferred to aerodrome control
- b) Departing aircraft are taken over from aerodrome control until they no longer wish to receive a service;
- c) Over flying aircraft under the control of approach control until they are clear of the approach pattern and either no longer wish to receive a service.

Aircraft within an aerodrome traffic zone are required to comply with instructions from the air traffic control unit. Flight in class F and G airspace outside the zone is permitted without an air traffic control clearance. However, controllers may assume that pilots of aircraft flying in the vicinity of the aerodrome in RTF contact

with the air traffic control unit are complying with instructions unless they state otherwise. Controllers are to provide an air traffic control service accordingly.

1.3 Information to Aircraft

1.3.1 Traffic Information and Avoidance

Traffic information shall be passed and traffic avoidance advice given to aircraft on any occasion that a controller considers it necessary in the interests of safety.

Controllers of aerodromes located in class C, D and E airspace are to pass traffic information as shown in the table below:

Aerodrome Located in Airspace	Traffic Information to be Passed
Class C	To VFR flights on other VFR flights
Class D	A – To IFR flights on VFR flights B – To VFR flights on IFR flights C – To VFR flights on other VFR flights
Class E	As far as practicable: A – To IFR flights on VFR flights B – To VFR flights on IFR flights C – To VFR flights on other VFR flights

1.3.2 Flight Information

Approach control shall provide flight information to aircraft under its control; in particular any failure or irregular functioning of the aerodrome lighting system or approach aid.

1.3.3 Information to other Units

a) Aerodrome Control

Approach control shall supply the following information to aerodrome control:

- i. Pertinent data on all relevant flights including the type of flight (I.E, IFR or VFR) level of arriving aircraft and ETA;
- ii. The anticipated order in which control of aircraft is to be transferred
- iii. The anticipated delay to departing IFR flights together with the reason for the delay.

b) Area Control

Approach control shall supply to Area control the following data on IFR flights:

- i. Lowest level at the holding facility available for use by area control;
- ii. The average time interval between successive approaches;

- iii. Revision of expected approach times issued by area control when approach control calculations show a variation of 5 minutes or more;
- iv. Arrival times over the holding point if these vary from the estimate by 3 minute or more;
- v. Missed approaches when re-routing is entailed, in order that the subsequent action may be coordinated;
- vi. Departure times of aircraft;
- vii. All available information relating to overdue aircraft.

1.4 Coordination

a) Aerodrome Control

Approach control shall coordinate with aerodrome control:

- i. Aircraft approaching to land; if necessary requesting clearance to land;
- ii. Arriving aircraft which are cleared to visual holding points;
- iii. Aircraft routing through the traffic circuit.

Aerodrome Control will coordinate with approach control:

- i. Departing IFR flights
- ii. Arriving aircraft which make their first call on the tower frequency (unless they are transferred to approach control).

b) Area Control

Area control will coordinate with approach control an arriving aircraft which is to be cleared to an aerodrome holding facility or a visual holding, point, instead of the normal holding facility.

1.5 Transfer of Control

a) Aerodrome Control

IFR flights operating with visual reference to the surface may be transferred by approach control to aerodrome control in the following circumstances:

- i. When an aircraft carrying out an instrument approach has become no 1 to land, and for following aircraft when they are established on final approach and have been provided with the appropriate separation from preceding aircraft.
- ii. Aircraft operating in the traffic circuit.
- iii. Aircraft approaching visually below all cloud when the reported aerodrome visibility is 10km or more.

In the case of (B) and (C), the volume of traffic and aerodrome control workload must be such as to allow the use of one of the reduced separations permitted in the vicinity of aerodromes. In order to clear other aircraft to descend through the cloud formation it will be necessary for the aircraft approaching underneath to be kept more than 1000 feet below all cloud, or for horizontal separation to be provided.

1.6 Transfer of Communication

a) Aerodrome Control

Approach control may instruct IFR flights to establish communication with aerodrome control (for the purpose of obtaining landing clearance and essential aerodrome information) when the aircraft has become number one to approach and, for following aircraft, when they are established on final approach and have been provided with appropriate separation. Until such aircraft are flying with visual reference to the surface the responsibility for separation between them will remain with approach control; aerodrome control will not issue any instruction or advice, which would reduce the separation established by approach control.

1.7 VFR Flights

Approach control shall retain all arriving VFR flights under its jurisdiction until appropriate traffic information on IFR flights and other VFR flights has been issued and coordination effected with aerodrome control.

A particular watch should be kept for situation where a VFR flight may approach the aerodrome in a sector in which other aircraft are letting down on an instrument approach aid, or where sequencing is in operation. In these circumstances the pilot of the VFR flight should not be given clearance for a straight in approach and should be advised to avoid the initial and final approach areas.

Approach control must ensure that the VFR flights are transferred in sufficient time for an aerodrome to pass additional information in respect of local traffic.

1.8 Arriving Aircraft

1.8.1 Terrain Clearance

The assigned level in initial clearances to arriving aircraft should normally not be below the appropriate minimum sector altitude or, if this is not known, the highest minimum sector altitude. If pilot is flying at or has requested a lower level, or has confirmed that he is in a position to accept an air traffic control clearance at a lower level, a reminder of the highest sector altitude should be issued.

If a clearance is to be relayed to an arriving aircraft by a FIR controller at an ACC, the approach controller shall include the sector altitude in the clearance message pass to the FIR controller.

1.8.2 Released from Area Control

Area control will release arriving aircraft to approach control, provided at least 15 minutes warning were possible, as follows:

- a.** Aircraft identification and type;
- b.** Point of departure;
- c.** Release point;
- d.** Estimated time and level at the holding facility, or, arrival time and level at holding facility;
- e.** Expected approach time;
- f.** Contact point.

Area control will clear arriving aircraft to the holding facility if the flight is remaining within class A to F airspace, give instructions to hold if necessary and include an expected approach time in the clearance.

Approach control may issue any instructions to an aircraft released to it by area control, however, that aircraft must not be instructed to climb above, or stop its descent to, the level at the holding point, agreed with area control and passed in the released message, without prior coordination with area control.

After coordination with approach control, area control may clear an arriving aircraft to an aerodrome facility, or to a visual holding point.

CHAPTER 2. RUNWAY VISUAL RANGE

2.1 Aerodrome Operating Minima

Controllers are not responsible for determining, passing or enforcing the mandatory aerodrome operating minima and shall not question the authority of a pilot to attempt an approach to landing.

If pilot requests details of aerodrome operating minima, the controller is to pass the minima published in the aerodrome (AD) section of the Liberia AIP for the particular instrument approach procedure and is to advise that this is the lowest minima which would be applicable to a category A aircraft flown by an instrument rated pilot in current practice when all the aerodrome lighting facilities serviceable.

If there is a partial failure of the approach or runway lighting, the controller is not to recalculate the minima but is to add the un-serviceability to the essential aerodrome information.

2.2 Information to Aircraft

After an arriving aircraft has placed itself under the control of the approach control, the following information shall be passed as soon as practicable:

- a)** Runway in use
- b)** Current meteorological information together with the time of observation:
 - i.** Surface wind direction (in degrees magnetic) and speed. The maximum wind speed should be included if it is 10 knots or more greater than the mean speed and the extremes in direction when the variation is 60 degrees or more and the mean speed exceed 3 knots.

Note: Controllers should note that anemometers indicate magnetic direction but meteorological reports give wind direction in degrees true.
 - ii.** Visibility
 - iii.** Present weather
 - iv.** Significant cloud amount and height of base
 - v.** The appropriate barometric pressure setting
 - vi.** Relevant information reported by pilots of aircraft (vertical wind shear, severe icing, severe turbulence, etc.)
 - vii.** Significant meteorological information (thunderstorm, hail, etc.)
 - viii.** Warning of marked temperature inversion
 - ix.** Any other relevant information

x. Runway visual range

Note: This information may be reduced to items (i), (v) and (vi) when aircraft are below cloud flying in VMC and able to continue VMC to the landing.

- c) Current runway surface conditions when appropriate.
- d) Any changes in the operational status of visual and non-visual aids essential for approach and landing.

2.2.1 Subsequent Changes

Aircraft, which have received the information above, must be kept informed of the following, until they have landed:

- a) Significant changes in the meteorological and runway conditions;
- b) Further reports from other pilots
- c) Further changes in the operational status of approach and landing aids.

2.2.2 Transmission of Meteorological Information

When controllers receive requests for meteorological information from pilots they must ensure that the information supplied conforms to the request (e.g. a report shall not be given in place of a forecast).

As a general rule controllers shall only transmit to aircraft meteorological information that has been supplied, or agreed, by the meteorological office. The exceptions are:

- a) Indicated wind direction (degrees magnetic) and speed when anemometer indicator are fitted in the control room.
- b) RVR observation.
- c) Sudden or unexpected deteriorations of which, in the interest of safety, a controller considers it advisable to warn aircraft immediately and consult with the metrological office afterwards.
- d) Information to aircraft in flight may be passed to other aircraft when a controller considers that it may be useful to them, whenever this is done the controller shall state that the information originated from an aircraft in flight and the time at which the observation was made. Aircraft reports of meteorological conditions which affect safety, e.g. severe icing, severe turbulence, shall always be passed to other aircraft likely to be affected. Information on severe icing, and/or severe turbulence is to be communicated as soon as possible to the duty meteorological, re-caster who will decide whether the conditions warrant the issue of a special report.
- e) Observation made at aerodrome by ATS staff who hold a meteorological observers certificate.

- f) Observation made at aerodromes without accredited observers (Meteorological (MET) office staff or MET accredited ATS personnel) are not regarded as 'official' report. If transmitted to aircraft or disseminated beyond the aerodrome, the message must be prefixed by: "unofficial observation from...(Name of aerodrome)...at (time).....UTC gives....'

Note: Observation of visibility passed to aircraft making an approach to land when the visibility is less than 1500m are to be logged.

SIGMET messages should be relayed with the least possible delay to all aircraft likely to be affected, but without prejudice to control of aircraft in flight.

2.3 Visual Approach

To expedite traffic at any time, IFR flights may be authorized to execute visual approaches if the pilot reports that he can maintain visual reference to the surface and:

- a. The reported cloud ceiling is not below the initial approach level, or
- b. The pilot reports at any time after commencing, the approach procedure that the visibility will permit a visual approach and landing, and a reasonable assurance exists that this can be accomplished.

Standard separation shall be effected between such aircraft and other arriving and departing IFR and/or SVFR aircraft.

2.4 Instrument Approaches

Official instrument approach procedures are notified by the authority. Pilots are normally expected to be conversant with these procedures, but in exceptional circumstances a pilot may request the information. When this request is made, or it is apparent that the pilot is not conversant with these procedures, the following information is to be transmitted:

- g) On initial contact:
 - i. This is the approach procedure for...(Aid)...for category A aircraft. Final approach track.....degrees.
 - ii. Arrival level (if necessary)
 - iii. Type of reversal maneuver including outbound track, length in time or distance, level instructions and directions of procedure turn where applicable
- h) When aircraft commences final reversal; intermediate and final approach track, intermediate and final approach fixes together with level instructions, and OCH.
- i) Missed approach point and missed approach procedure (when

required).

Items (a) (ii) and (iii) may be omitted for straight-in approaches.

If the pilot is copying down the information, the whole procedure can be passed in one message.

Even if visual reference to the ground is established before completion of the approach procedure, the pilot will normally complete the whole procedure. At his request however, he may be cleared to break off the instrument procedure and carry out a visual approach. Separation from other traffic is to be provided unless the pilot cancels his IFR plan.

2.5 Holding Procedures

Holding shall be accomplished in accordance with notified procedures. If the notified entry and holding procedures are not known to the pilot, the appropriate air traffic control unit shall describe the procedures to be followed.

Levels at holding facilities shall be assigned so as to permit aircraft to approach in their correct order. Normally the first aircraft to arrive over a holding facility should be at the lowest level with following aircraft at successively highly level.

Departure times of aircraft from the holding facility shall be based on the desired time interval between aircraft landing. If the weather conditions are such that the pilot may encounter difficulty in completing the landing, the time interval may be increased to allow the first aircraft to land before the second aircraft commences descent to final approach.

If a pilot advises that he is unable to comply with approach control holding or communication procedures, alternative procedures requested by him should be approved if traffic conditions permit.

2.6 Approach Sequence

The approach sequence shall be established in a manner which will facilitate arrival of the maximum number of aircraft with the least delay.

When aircraft are given a time at which to leave the specified aerodrome holding facility, the departure time will be passed sufficiently in advance to permit the pilot to arrange his flight path accordingly.

The first aircraft will descent from the lowest level of the holding stack and commence approach when instructed.

The second aircraft in the approach sequence may be instructed to descend to the level previously occupied by the first aircraft after the first has reported vacating it. If, however, severe turbulence is known to exist, the instructions will be withheld until the first aircraft has reported at least 1000 feet below the vacating level.

The second aircraft may be instructed to leave the holding facility and descend for approach when the required separation has been established between it and the preceding aircraft and reasonable assurance exists that a normal landing can be accomplished.

2.6.1 Expected Approach Time (EAT)

Approach control shall calculate expected approach times for aircraft likely to be delayed before commencing an intermediate approach.

Unless otherwise instructed, controllers shall pass Expected Approach Times (EATs) to aircraft with which they are in contact. EATs will not normally be issued when the delay is expected to be less than 20 minutes. The statement 'no delay expected' is only to be used, particularly for long haul flights, if it genuinely reflects the situation. However, at the request of a pilot, controllers are to give a general indication of the likely delay based on the information available at that time.

2.6.2 Holding for Weather Improvement

Pilots of arriving aircraft may elect to hold for the weather to improve. In addition to passing routine weather reports, controllers are to advise pilots of other relevant meteorological information.

The first aircraft to enter the holding patterns is to be advised, 'no traffic delay expected'. No instruction to leave the holding facility shall be given until the pilot indicates his intention to attempt a landing.

Subsequent aircraft entering the holding pattern shall be advised 'delay not determined. (Number) aircraft holding for weather improvement; controllers should establish the intention of any pilot if it has not already been stated.

When a pilot wishes to make an approach he is to be given routine instructions to enable him to descend clear of other traffic and return to the holding facility above other aircraft, which have elected to make an approach. He is to be given an expected approach time relative to those aircraft and will take his in the normal landing sequence.

If aircraft are making approach in poor weather conditions the possibility of missed approaches shall be considered. The lowest holding level at a convenient holding facility shall normally be kept vacant for such eventualities.

2.6.3 Diversions

Where marginal weather conditions exist or where the need for diversions is likely to arise due to the state of the aerodrome, traffic density, or for an other reason, controllers at aerodrome are to maintain the closest liaison with operating companies and the supervisor at the parent ACC. They shall pass, as often as necessary, the latest pertinent information so that diversion – may be anticipated and not interrupt the smooth flow of air traffic.

When the need does arise, the controller concerned is to take the following actions:

1. Hold the aircraft in the vicinity of the aerodrome.
2. Contact the supervisor at the ACC by telephone and advise him of the aerodrome selected for diversion or if none selected, seek his advice as to the one most suitable.
3. Pass diversion messages to aircraft
4. Obtain clearance instructions together with any other instructions to be passed to aircraft.
5. If required, pass alternate aerodrome weather report.
6. Advise the operating company or nominated addressee in accordance with the instructions.

2.6.4 Aerodrome Receiving Diversions

When a controller is informed that aircraft are about to divert to his aerodrome, he shall ensure that full details are passed to the aerodrome authority.

After a diverted aircraft has landed an arrival signal shall be sent to:

- a) The aerodrome of departure
- b) The point of first intended landing
- c) The ACCs serving the original planned route.

At aerodrome not open on a 24 hour basis, close liaison shall be maintained with the aerodrome authority and the parent ACC before watch is closed if it is known that diversions are likely to be received.

Details of the procedures for arranging extensions of shall be agreed upon with the aerodrome authority.

2.7 Departing Aircraft

Air traffic control clearances issued by approach control shall specify any or all of the following:

- a. Turn after take off
- b. Track to make good before turning on to desired heading.
- c. Initial level to fly
- d. Time, point, and/or rate at which changes of level are made.

A clearance expiry time determined by approach control, when considering its own traffic, must not be later than that issued by area control.

Outbound clearances issued by area control to approach control may not take into account the need for separation from any inbound aircraft which have passed the release point. This responsibility rests with approach control.

Outbound clearances issued before inbound aircraft pass the release point will take into account the need for separation of traffic except in cases where separation is automatically ensured by the use of fixed operating procedures (e.g. Standard instrument departures, standing agreements, etc.) or the outbound clearance is qualified by a 'release subject to discretion' (RSYD) restriction.

As RSYD restriction is intended to facilitate the overall expedition of traffic where approach control procedures may offer a more expeditious resolution of the confliction that area control procedures.

In accepting an RSYD clearance the approach controller accepts the responsibility for the provision of separation between the outbound aircraft and the conflicting inbound or over flying aircraft. Before clearing the outbound aircraft for separation the approach control must ensure that:

- a. He has received the release message on the inbound aircraft or full details of the over flying aircraft.
- b. He can provide the required separation.

Before the outbound aircraft is transferred to area control the conflictions must have been resolved or coordination effected.

2.8 Joining and Over Flying Aircraft

When an aircraft requests permission to enter controlled airspace for the purpose of landing at the associated aerodrome or transiting the airspace that may not be possible, for traffic reasons, he must issue that clearance immediately.

In such situations controllers will advice the pilot when to expect clearance and give a time check.

SECTION V.

EMERGENCY PROCEDURES

CHAPTER 1. AIRCRAFT EMERGENCIES

The circumstances of each aircraft can vary to such an extent that detailed instructions cannot be given for every situation. The procedures outlined in this section are intended as a General Guide and controllers must use their own judgment when handling a particular emergency.

The procedures described in the preceding sections and the appropriate standard phraseology may also be varied to meet an emergency situation but any reduction in separation, necessary to cope with the emergency, should be restored as soon as possible.

Controllers shall offer as much assistance as possible to any aircraft which is considered to be in emergency situation. Assistance to the aircraft can include the provision of information on the availability of aerodromes and their associated approach aids, weather information and details of terrain clearance. An emergency may require alerting action to be taken immediately or it may develop to that point later.

The supervisor, if available, should be informed as soon as practicable and where more than one air traffic service unit is involved complete coordination must be maintained between units.

If an ACC is involved the ACC supervisor should take charge of the operation. Controllers must be ready to give all possible assistance to the ACC, ARCC and other units. If more than one ACC is involved then the supervisors should agree between them which one takes charge.

1.1 *Recognizing and Emergency Situation*

A controller may suspect that an aircraft is in an emergency situation when:

- a) Radio contact is not established at the time it is expected to be established.
- b) Radio contact is lost,
- c) A pilot makes a report about the malfunctioning
- d) The erratic behavior of an aircraft
- e) It is overdue at an aerodrome
- f) The pilot reports that the aircraft is short of fuel

If the controller is in radio contact with the aircraft he should ask the pilot if he wishes to declare an emergency and, if not specified by the pilot, the class of emergency being declared. More positive indications that an aircraft is in an emergency are described in the following paragraphs.

1.1.1 **Distress and Urgency Messages**

There are two classes of emergency message:

Distress: A condition of being threatened by serious and/or imminent danger and requiring immediate assistance

Urgency: A condition concerning the safety of an aircraft or other vehicle, or some person on board or within sight, but which does not require immediate assistance.

The message will contain as many as possible of the following items:

- May day, may day, may day (for distress messages) or
- Pan pan, pan pan, pan pan (for urgency messages) and

- Name of the station addressed (time and circumstances permitting)
Identification of the aircraft
- Nature of the Emergency
- Intention of the person in command
- Present position, level and heading qualification of the pilot e.g student IMC or full instruments rating (urgency message).
- As much other information as the permits. If the position is stated in terms of DECCA or LORAN coordinates, the RCC will convert it to latitude and longitude at the request of the aircraft supervisor.

1.1.2 Indications by visual signal from aircraft

Notification of distress by visual signal will be by one or more of the following methods:

- The signal SOS with signaling apparatus
- A succession of pyrotechnical lights fired at short intervals, each showing a single Red light
- A parachute fire showing a red light

Notification of urgency by visual signal will be:

- a) For an aircraft in difficulties which compels it to land without required assistance;

The following signals:

- Switching the landing lights on and off repeatedly
- A succession of white pyrotechnical lights

- b) For an aircraft with a very urgent message to transmit concerning the safety of an aircraft (including that sending the message) a ship or person; the signal XXX with a signaling apparatus.

1.2 Emergency Aircraft – Selection of controlling agency

On receipt of information which indicates that an aircraft is in an emergency, the controller must decide whether or not to transfer the aircraft to another agency.

The choice of agency will depend upon the circumstances and no hard and fast rules apply. The following guidance material will help controllers to make decision:

1.2.1 Retaining Control

If the controller can offer immediate assistance the aircraft should normally be retained on the frequency.

Alternatively it may be more expedient – to transfer the emergency aircraft to a discrete frequency, particularly if a radio silence would endanger other traffic. The aircraft will have to be retained on the original frequency, if it is unreasonable to ask the pilot, or if he is not prepared, to change frequency. The controller may be able to relay instructions and information from other units to the pilot.

1.2.2 Transferring Control

If a controller considers that another unit may be able to give more assistance than he can himself, and in the circumstances it is reasonable to ask the pilot to change frequency, he shall either:

- a) Consult the ACC supervisor and transfer the aircraft according to his instructions, or
- b) Alert the nearest suitable unit and transfer the aircraft to a common frequency, giving assistance to that unit as required.

Before transferring aircraft, controllers should obtain sufficient information from the pilot to be convinced that the aircraft will receive more assistance from another unit if a change of frequency is desirable the pilot must be instructed to revert immediately if there is not reply on the new frequency. Controllers should than listen out in the original frequency until the aircraft is known to be in two way communication.

1.2.3 Intercepted Messages

If a controller intercepts a message from an aircraft which indicates that it is in an emergency he should, if possible, obtain a VDF bearing and pass it to the station being called. He should continue to listen out until he is satisfied that the aircraft is in two way communication with an air traffic services unit.

If it appears that the message is not being acknowledged the controller shall, in addition:

- a) Forward the message to the station being called and/or the ACC supervisor;
- b) Attempt to establish two way communication with the aircraft, and
- c) Give every assistance to the emergency aircraft.

1.3 Aircraft Emergencies – General Principles

Having decided to retain the aircraft and deal with the emergency, controllers

shall use every means available to assist the pilot. Each situation must be dealt with according to the circumstances. Controllers are to take any of the actions described below which may be appropriate.

1.3.1 Local Emergency Services

Alert local emergency services in the area of the expected forced landing. This should be done via the ACC supervisor unless the aircraft is within the radius of the aerodrome.

If it is doubtful that an aircraft can reach an aerodrome, the distress phase exists. The ACC supervisor must be informed so that he can take alerting action with the Rescue Coordination Center (RCC).

1.3.2 Nearest Aerodrome

Advise the pilot of the nearest aerodromes and suggest a suitable aerodrome for landing. The ACC will be able to assist in the selection.

Notify the aerodrome selected for emergency landing so that it can make suitable preparations.

Warn other aerodromes in the vicinity and on track to standby. This can most easily be done through the ACC supervisor.

1.3.3 Plot Position

Plot the position of the emergency aircraft and its subsequent track. It may be advisable to plot the position and track on a map. VDF can be used to fix the position by obtaining bearings from other units having the same frequency. Controllers should always pass position and bearing information about an emergency aircraft to other interested units; particularly the ACC.

1.3.4 Uninterrupted Approach

- Ensure that an aircraft in an emergency has an uninterrupted approach to the selected aerodrome;
- Rearrange the traffic pattern if necessary.

1.3.5 Emergency Descent

An aircraft making an emergency descent through other traffic shall be given priority category A. Controllers shall give all necessary assistance and information and take immediate action to safeguard other aircraft.

When necessary, controllers are to broadcast an emergency message on appropriate frequencies giving instructions to other aircraft during and after the emergency descent. Ideally, aircraft should be instructed to leave the area by a published route. If no such route exists, detailed instructions are to be given for a simple route out of the area.

1.3.6 Supervisor at the ACC

Inform the supervisor at the ACC of the aircraft emergency giving details of actions already taken. The supervisor is responsible for:

- a) Coordinating the operation unless immediately effective action can be taken at the originating unit
- b) Taking alerting action

1.3.7 Other Aircraft

Advise other aircraft likely to be affected or able to assist.

1.3.8 Aircraft Operator

Inform the operator if one of his aircraft is in an emergency. Normally the ACC supervisor should keep the operator informed of all subsequent developments.

A message from the operator (e.g. Bomb warning, suspected danger to airframe, etc.) is to be passed to the commander immediately using the operator's own words. A message which has to be relayed via an ACC outside the Roberts FIR must be confirmed with a signal, priority SS, and addressed to the aircraft.

1.3.9 Handling Aircraft Emergencies

When a pilot has declared an emergency and stated the aerodrome to which he wishes to proceed, controllers will acknowledge this message.

If the controller is instructed to inform the aircraft that is required or requested to divert to another aerodrome then the reason for this change should be established. The message together with the reason will then be passed to the captain and his intentions requested.

It is desirable that aircraft in emergency should not be routed over densely populated areas. If this inconsistent with providing the most appropriate service to the aircraft, for example, when any extended routing could jeopardize the safety of the aircraft, the most expeditious route is the one that should be given.

Where possible, suggestions of alternative runways or aerodromes, which would avoid densely populated areas and be consistent with safety, should be passed to the pilot and his intentions requested.

1.3.10 The Decision to comply with advice or instructions

To land at an airport, other than this, the selected diversion lies with the captain of the aircraft who has ultimate responsibility for the safety of the aircraft. It is recognized that controllers providing en-route services at ACCs may not be aware of the boundaries of major cities, towns or villages. However, controllers providing aerodrome, approach or approach radar control services should be familiar with the center of population with their areas of jurisdiction.

1.3.11 Dangerous Goods

When the pilot of an aircraft in emergency states that he is carrying dangerous goods, the message must be relayed without delay to the air traffic services unit at the aerodrome of intended landing. The senior controller at the aerodrome must notify the aerodrome authority immediately.

An aircraft carrying dangerous goods which requires special handling is not to be deviated from its flight-planned route except in an emergency. If the aircraft has to divert, the first choice should be Roberts International Airport (RIA) which has the expertise in handling and parking aircraft with dangerous goods on board. Spriggs Airport does not have the necessary expertise and is thus not suitable for diversion.

1.3.12 Fuel Jettisoning

Pilots of aircraft in flight are permitted to jettison fuel in an emergency. The decision to jettison rests solely with the pilot but he may request guidance from air traffic control. Controllers are to recommend that jettisoning of fuel should be carried out:

- a) Over the sea, if at all possible;
- b) Above 10,000 feet AGL; or
- c) Vertical separation of at least 1000 feet between aircraft should be maintained.

CHAPTER 2. AIRCRAFT LOST

Every possible assistance is to be given to a pilot who reports that he is lost or uncertain of his position. A controller should not be influenced by the fact that any action that he takes may ultimately prove to have been unnecessary.

2.1 *Terrain Clearance*

It is particularly important to consider terrain clearance if the aircraft is flying at a low level. Controllers must make allowance for terrain and obstruction within a wide area around the estimated position of the aircraft and advise the pilot to climb if there is any doubt that adequate clearance exists. If a pilot is unable or unwilling to climb he is to be warned of potential hazards at that level

2.2 *Aircraft below coverage*

A controller may advise a pilot to climb if communications are poor. Pilots have been advised to tell the controller if they consider that to climb might face them with flight condition beyond their capabilities or that they prefer to remain in visual contact with the surface.

CHAPTER 3. OVERDUE AIRCRAFT

Overdue action should not be considered in isolation and the emergency actions described in other chapters should be applied if they are appropriate. For example, if a radio equipped aircraft fails to make an expected report continued attempts should be made to reestablish communication while at the same time commencing overdue action.

Overdue action is not related solely to the filing of a flight plan. If, at any stage of a flight the pilot has made his intentions clear and subsequently does not arrive or report when expected, controllers should seriously consider taking overdue action.

Overdue action described in this chapter must be commenced not later than the times shown in the following paragraphs. The decision to take overdue action before these times is left to the discretion of the controller. The following points may assist in making the decision:

Types of aircraft - Strict adherence to the flight plan cannot always be expected of a non-radio light aircraft.

Route - The need for prompt action if the route is over sparsely populated areas, mountainous country, and long stretches of water, etc.

Weather - The pilot of non-radio aircraft might well be expected to extend his flight time by deviating from his planned route to avoid bad weather. Where no additional hazards exist, sufficient time for a deviation should be allowed

3.1 *Aerodrome Procedure*

3.1.1 **Non-Radio Aircraft - Preliminary Action**

The following preliminary action for non-radio aircraft shall be commenced no later than 30 minutes after ETA:

Check flight plan for obvious errors in compilation or transmission. Consult operating company or representative if available.

Confirm ATD with aerodrome of departure using the quickest means of communication. Inform the ACC supervisor of the situation and in coordination with him:

- a. Check with alternate aerodromes
- b. Send RQS message
- c. Check with any likely aerodromes on and adjacent to the proposed route of the aircraft

3.1.2 Non-Radio Aircraft - Full Overdue Action

The following overdue action for a non-radio aircraft shall be commenced not later than one hour after ETA:

- a. Notify the parent ACC that the aircraft is now fully overdue and state the action already taken;
- b. In consultation with the ACC supervisor, continue endeavors to trace the aircraft, e.g. Notify local police or any other appropriate bodies to be on the look out for the aircraft if it is assumed that it has made a forced landing in a particular area.

3.1.3 Radio Equipped Aircraft - Preliminary Action

If an aircraft fails to make a position report when expected, the following preliminary action shall be commenced not later than the estimated time for the reporting point plus 10 minutes:

- a. Advise the ACC supervisor that the aircraft is overdue.
- b. Confirm ATD from departure aerodrome by quickest possible means
- c. Ensure that an RQS message is sent

3.1.4 Radio Equipped Aircraft—Full Overdue Action

If after the action above no news is received, or one hour has elapsed since a scheduled position report should have been received, or the fuel carried by the aircraft is considered to be exhausted, whichever is the sooner, the controller at the destination aerodrome shall inform the ACC supervisor that the aircraft is fully overdue.

3.1.5 Non-Appearence of Aircraft

If an aircraft which has been cleared to commence approach, after completing any necessary holding, fails to land within 5 minutes of the estimated time of landing and communication can not be established, the following action shall be taken:

- a. Request other aircraft flying in the vicinity of the aircraft's last known position to be on the lookout;
- b. Exercise caution when authorizing the movement of aerodrome traffic;
- c. Alert the emergency services in accordance with local emergency procedures;
- d. Check with other aerodromes in vicinity;
- e. If necessary, send RQS message;
- f. Advise the ACC supervisor.

CHAPTER 4. RADIO FAILURE

Radio failure procedure should not be considered in isolation and emergency action described in other chapters should be applied if they are appropriate. For example, if an aircraft fails to make a report when expected, overdue action may have to be taken at the same time.

Radio failure procedure shall be adopted when:

- a.** Communication cannot be maintained with an aircraft on any flight which is being provided with air traffic control advisory service,
- b.** Communication cannot be established with an aircraft operating, or intending to operate, on an IFR flight plan within controlled or advisory airspace.

The following procedures are based on the assumption that the pilot will comply with the current procedures for radio failure.

4.1 Standard Procedure

After attempts to establish or re-establish communication have failed controllers are to carry out the following standard radio failure procedure:

- a.** Maintain separation between the radio failure aircraft and other known traffic.
- b.** Give pertinent information about the movement of the radio failure aircraft to other aircraft in the presumed vicinity
- c.** Ask aircraft in the presumed vicinity to establish communication with the radio failure aircraft and relay messages.

Transmit, on the appropriate frequencies:

- a.** Level, route and EAT (or ETA) to which the radio failure aircraft is assumed to be adhering; and
- b.** The weather condition at the destination aerodrome, a suitable alternate and, if practicable, in areas suitable for a descent through clouds.

When in consultation with the operator, instructions to divert have been transmitted to the radio failure aircraft, inform the alternate aerodrome and request that they attempt to establish communication.

CHAPTER 5. HIJACKING AND UNLAWFUL INTERFERENCE

Instances may occur when civil and military aircraft operate unlawfully or without proper authorization within the Republic of Liberia airspace including:

- i. The unlawful seizure, or exercise of control of an aircraft by force or threats (hijacking),
- ii. The unauthorized removal of an aircraft and its subsequent flight,
- iii. Flight of an aircraft with intent to defect,
- iv. Illegal use of an aircraft to effect the escape of prisoners or special hospital patients
- v. The use of an aircraft in the furtherance of a crime

5.1 Safety

At all times the safety of the aircraft and its occupants is of prime importance. Unless otherwise specifically directed by a responsible higher authority, the policy within the Republic of Liberia is for hijacked aircraft to land as soon as possible. Request from the lawful commander, which he states are essential for flight safety, are to be complied with and no attempt shall be made to influence the course of events without his concurrence.

5.2 Direction

The watch supervisor at the appropriate area control center will act as the ATC coordinating authority for the incident unless responsibility is delegated to another agency by the responsible higher authority.

Responsibility for overall direction of the incident will rest with government officials acting through the Civil Aviation Authority and the ATC coordinating authority. Controllers should be aware that their communications with these aircrafts may be subjected to government instructions in accordance with the contingency plans not detailed here.

Such contingency plans may result in requests to issue instructions, which, whilst not prejudicing safety in any way, controllers would not otherwise consider suitable.

5.3 ATC Operations

The aircraft concerned shall be given priority where possible. Any reference to the special situation is to be avoided in ground/air communications with other aircraft unless it has first been referred to in communications from the aircraft involved and it is reasonable to assume that such reference will not aggravate the situation. Where more than one aircraft is involved in the incident, reduced separation may be allowed between the aircraft involved at the request of a lawful commander.

CHAPTER 6. ALERTING SERVICE

The alerting service is available for all aircraft, which are known by the air traffic services to be operating within Roberts Flight Information Regions.

The responsibility for initiating action normally rests with the air traffic service unit which was last in communication with the aircraft in need of search and rescue aid or which receives news from an outside source.

6.1 Aerodromes

Approach and aerodrome control units, when they are aware that an aircraft is in need of search and rescue aid, shall immediately:

- a) Set in motion the local rescue services and emergency organizations
- b) Notify by telephone the watch supervisor at the parent ACC.

6.2 Aeronautical Rescue Coordination Centers (ARCC)

An Aeronautical Rescue Coordination Center (ARCC) is responsible for promoting efficient organization of search and rescue service and for coordinating the conduct of search and rescue operations within a search and rescue region. In the RFIR the ARCC is located at the Area Control Center.

The area control center shall notify aircraft emergencies, which require search and rescue aid to the Area Rescue Coordination Center. Other area control centers, which may be involved, shall also be informed.

The ARCC controller is responsible for initiating search and rescue action. To assist him in this task, the watch supervisor may include a recommendation for search and rescue action in the telephone message.

Message shall not be delayed because of lack of information. If a message is incomplete, a further message is to be sent when the information is available.

Further, messages are to be sent:

- a) If any useful additional information is received, and
- b) When the emergency situation no longer exists.

If an alerting message is received from an adjacent area control center, the supervisor shall:

- a) Telephone the message to the Aeronautical Rescue Coordination Center, without delay, and confirm by teleprinter signal (unless it is known that the ARCC has the information).

- b) Assist the initiating area control center in searching for information about the aircraft in emergency.

The search and rescue organization is described in the General (Gen) Section of the RFIR.

6.3 *Rescue Aircraft Callsign*

The callsign of Rescue aircraft, when involved in search and rescue operations, will be pre-fixed by the word 'Rescue'. Helicopters and marine craft will prefix their callsigns 'Rescue Helicopter' and 'Rescue Boat'!

When aircraft in the service of the Coast Guard are being used for search and rescue purposes they will adopt the callsign 'Coast Guard Rescue'.

6.4 Phases of Emergency

Tables 6.4.1 and 6.4.2 below show the phases into which emergencies fall. The decision to declare a phase earlier than described must be left to the direction of the controller.

Table 6.4.1 – Table of Emergency

Radio Failure	Overdue	Operating Efficiency Impaired	Forced Landing (Crash)
No communication within a period of 30 minutes after the time it should have been received Or From the time an unsuccessful attempt to establish communication was first made	Fails to arrive within 30 minutes of the ETA last notified to, or estimated by ATC which ever is the later Or Has been cleared to commence approach after completing any necessary holding and fails to land within 5 minutes of the estimated time of landing		
Attempts to establish communication during the uncertainty phase have failed	Enquiries to relevant sources during the uncertainty phase have failed to reveal any news. Or Has been cleared to land and fails to land within 5 minutes of estimated time of landing and communication cannot be re-established.	But not to the extent that a forced landing is likely	
Further attempts to establish communication during the alert phase have failed	More wide-spread enquiries during the alert phase have failed to reveal any news. Or The fuel on board is considered to be exhausted or insufficient for the aircraft to reach safety.	To the extent a forced landing is likely	Known to have forced landed or crash.

Table 6.4.2 – Emergency Phases

Exceptions	Phase	Duration	Action Taken
No doubt as to the safety of the aircraft and its occupants	Uncertainty	Maximum of 30 minutes	ARCC and ACC collect and evaluate reports. Rescue and other ARCCs may be informed of the situation
Evidence exists that would delay apprehension as to the safety of the aircraft	Alert*		ARCC alerts the search and rescue services for immediate action
Where there is a reasonable certainty that the aircraft and its occupants are not threatened by grave and imminent danger and do not require immediate assistance.	Distress		ARCC puts the search and rescue operation and directs its for the duration of this phase

*An alert phase will be initiated when an aircraft is known or believed to be the subject of unlawful interference.

6.5 Telephone Precedence

Most air traffic control units have direct operational telephone lines for use in emergencies. However, if it is necessary to use operational or administrative networks, a precedence call may be appropriate. The order of precedence is:

- 1) Distress
- 2) Urgent (Civil or Government)

A distress call is used for a call of extreme operational emergency or concerned with the safety of human life. It takes absolute precedence over all other calls and will be connected immediately, other call being disconnected if necessary. On NATS networks the term 'Distress Call' is used with the routing instruction, eg.:

'Distress call to Scottish ACC'

An urgent precedence is used for operational and administrative calls which should not suffer the delays of ordinary calls. However, connected ordinary calls will only be disconnected at the request of the caller. Staff at civil aerodromes and civil air traffic service units are to use the term civil urgent for such calls. Military units and government departments use the term Government urgent.

Distress and urgent calls should be kept to a minimum consistent with safety and a controller should be prepared to give his name to the operator.

6.5.1 Telephone Message

The alerting message by telephone shall comprise the following:

- The phase of emergency – uncertainty, alert or distress
- Aircraft Identification Item 7 (From the Transmitted Flight Plan)
- SSR Mode and Code Allocated
- Flight Rules Item 8
- Number and Type of Aircraft Item 9
- Equipment Item 10
- Aerodrome and time of departure Item 13 (From the Transmitted Flight Plan)

- For Boundary estimated
Speed, Level and Route Item 15
- Destination/EET/Alternate Item 16
- Other information Item 18
- Supplementary Information Item 19 Pilot's Name from the filed flight plan Retained at the Departure Aerodrome.
- Operator (If not included above unit which made the last contact, time and RTF frequency.
- Last reported position and method of determination aircraft color and markings Action taken by reporting unit.
- Other pertinent information. (To include recommendation for SAR action if appropriate).

CHAPTER 7. AERODROME EMERGENCY SERVICES

The responsibility for altering the aerodrome emergency services normally rests with the air traffic services. In general the air traffic service unit last in communication with the aircraft or receives information from an outside source that an aircraft is in need of rescue aid shall initiate action.

No specific instruction can be made for an aircraft which crashed during the transfer of communication from one air traffic service unit to another. But as soon as either unit becomes aware of the incident it must be agreed immediately which unit is to alert the emergency services.

7.1 Aerodrome Authority

The aerodrome authority is responsible for:

- a) The preparation of detailed emergency orders applicable to a particular aerodrome and making them available to all personnel concerned in aircraft emergencies.
- b) Determining the radius of action of the aerodrome fire service, which may include an area adjacent to and outside the boundary. The size of attendance within this radius will as far as possible be predetermined and regulated subsequently.
- c) Advising the air traffic control unit and aircraft operators whenever the fire and rescue services are depleted for any reason. Such messages will normally be given in a form, which is suitable for immediate relay to aircraft.

7.2 Air Traffic Control Unit

When an air traffic control unit becomes aware that an aircraft is in need of rescue and within the radius of action the controller shall immediately alert the emergency services and, in accordance with the aerodrome emergency orders, give them the fullest available information.

If the Rescue services depleted for any reason, the air traffic control unit at the aerodrome shall:

- a) Transmit to aircraft the message received from the aerodrome authority.
- b) Inform the watch supervisor at the ACC.

When full emergency or local standby action is to be instituted, the pilot should be asked to confirm the aircraft type unless there is a reasonable assurance from

another source that the type shown in the flight plan is correct.

Whenever possible controllers should anticipate the need for aerodrome fire service vehicles to proceed to the rendezvous point and should issue clearances in advance of requirements. Other traffic may be stopped or diverted to avoid conflict with appliance.

If it is known that an aircraft which has crashed or about to crash had radioactive material on board or is carrying any dangerous goods, including agricultural chemicals in a crop spraying aircraft, the Rescue services shall be so informed.

7.3 Aerodrome Fire Service

The aerodrome fire service will be responsible for final determination of the size of the response which will depend upon whether the accident is within or outside the aerodrome boundary. Normally, a full response is made to all incidents within the boundary. The fire service aerodrome categories are listed below:

7.4 Categories of Emergency

It is the responsibility of the aerodrome authority to prepare detailed emergency orders, which include the terms and priorities to be used for alerting the emergency services.

The following terms are generally used but individual variations and extra terms may be found in local emergency orders.

7.4.1 Aircraft Accident/Aircraft Accident Imminent

When an aircraft accident has occurred or is inevitable on, or in the vicinity of the aerodrome. (At some units aircraft accident covers both situations).

7.4.2 Aircraft Ground Incident

When an aircraft on the ground is known to have an emergency situation other than an accident, which requires the attendance of emergency services.

7.4.3 Full Emergency

When an aircraft is known or is suspected to be in such trouble that there is danger of an accident.

7.4.4 Local Standby

- a) When an aircraft is known or suspected to have a defect, but one which would not normally involve any serious difficulty in effecting a safe landing
- b) When an aircraft is to be searched following a bomb warning
- c) When an aircraft required inspection by the aerodrome fire service.

7.4.5 Weather Standby

When weather conditions are such as to render a landing or take off difficult or difficult to be observed by the air traffic controller. In any case, when the visibility is less than 2500 meters and/or the ceiling is less than 500 feet.

ATC shall request Rescue and Fire Fighting Service (RFFS) for weather standby and advise on the following:

- a) Type of aircraft
- b) Fuel on board; and
- c) Persons on board.

ATC shall also advise the following:

- a) Mobile 1
- b) Mobile 2
- c) Mobile 3 and
- d) AIS and airline operator(s)

All rescue vehicles shall proceed to Taxiway Charlie, and standby with engines running and announce their readiness and strength to ATC.

7.4.6 Movement

A state of readiness by RFFS that must exist during aircraft engine startup and landing.

- a. ATC shall alert RFFS by radio or telephone and advise on aircraft type and category.
- b. RFFS shall man all required vehicles and remain at the station, while vehicle engines running.

7.4.7 VIP Operation

During VIP flight operations, the airport authority closes the airport to all other flights 45 minutes prior to arrival and 30 minutes after departure of the VIP flight.

ETAs and other information concerning VIP flights shall be passed to the appropriate agencies or their designated representatives.

Information of the airport closure is promulgated via AFTN or on ATS communication links.

7.4.8 Domestic Fire

Any Fire:

- a) On the aerodrome, not included in the categories above.
- b) Outside the aerodrome boundary (other than an aircraft accident) which is liable to constitute a danger to flying as aerodrome property.
- c) Which the aerodrome fire service should attend:
 - i) According to agreement with the fire Brigade
 - ii) In response to calls from the public or police on humanitarian grounds.

At an aerodrome where communications between the Aerodrome Fire Service and Aircraft during an Emergency is available, communication between an aircraft in an emergency and the aerodrome fire service may take place on 121.5 MHz.

Communication will only take place when the aircraft is on the ground and the pilot will maintain a listening watch on the appropriate ATC frequency. The air traffic control unit will be informed when 121.5 MHz is to be used.

7.4.9 Removal of Crashed Aircraft

Removal of the crashed aircraft is the responsibility of the aerodrome authority and the aircraft owner or operator. In case of a reportable accident, the permission of the CAA is required before removal action can be commenced.

7.4.10 Emergency Removal

If it is apparent that the continued obstruction of a runway, or interference with an approach aid by a crashed aircraft might further endanger life, e.g. other arriving aircraft having insufficient fuel for diversion, the SATCO should ensure that the emergency situation is fully understood by the aerodrome authority. Under normal circumstances the CAA may be contacted at any time without undue delay. Exceptionally, if there are communication difficulties, the aerodrome authority may wish to take action in accordance with the Liberia Civil Aviation (investigation of accident) Regulation which provide that an aircraft may be removed or interfered with so far as may be necessary for the purpose of preventing any danger or obstruction to the public or to air navigation.

CHAPTER 8. USE OF STANDARD PHRASEOLOGY BY CONTROLLERS

Attention is drawn to the need for the use of Standard phraseology when an appropriate 'Standard phrase' exists. This is particularly important when the pilot involved is not speaking his or her native tongue. Several incidents, some involving losses of separation have occurred when controllers have modified the standard phraseology when communicating.

Controllers are also reminded that they are required to listen to and verify the accuracy of read backs by pilots. This is particularly important when either conditional clearances are issued or the transmission contains more than one level or heading; as a guide, a controller should not include more than 3 items of information that require a read back. If there is a language difficulty then this number must be reduced, if necessary items passed and acknowledge singly.

8.1 Standard Phrases

Radio telephone messages transmitted on aviation VHF frequencies should normally comprise callsign and text. To avoid unnecessary reiteration, callsigns have been omitted from the lists of phrases in this attachment.

The text of messages should be composed from standard speech abbreviations and the standard phrases listed on the following pages. One or more phrases may be used but all items on a phrase are to be included. For example a route clearance must include the clearance limit and the level. In some cases there is a choice of phrases to cover the same situation, e.g. in the phraseology for crossing a runway. Designation may be omitted (if it is safe to do so) because both phrases are listed.

8.2 Non Standard Phrases

Neither the speech abbreviations nor the standard phrases are exhaustive and controllers will, on occasions, have to provide subsidiary phrases. These must be clear and concise is not applicable.

8.2.1 Ground Movement

Ground movement instructions are similar for aircraft, vehicles and tractors. Towing aircraft but the operative word in the message is 'Taxi', 'Proceed' and 'Tow' respectively.

Examples

Examples of messages which contain standard speech abbreviations and standard phrases as a dialogue between ground and air radio stations appear in Radio Telephony Procedures Phraseology.

Phraseology

- Climb and Descending
- Climb/Descend Flight Level (Number)
- Climb/Descent to Altitude (Number) feet QNH (Numbers) Mbs.
- Climb/Descent to Height (Number) feet QFE (Numbers) Mbs.
- Climb/Descent to Altitude (Number) feet.
- Climb/Descent to Height (Number) feet.
- When ready climb/descend (To) (Level).
- Climb/Descent immediately (To) (Level).

To be used only to resolve an urgent situation

- Report leaving/passing/reaching (Level).
- Climb/Descend (To) (Level) to be Level by (Time/Reporting Point).
- Climb/Descend Maintaining own separation and VMC (To) (Level).
- Stop Climb/Descend at (Level)
- Expedite Climb/Descend
- To Require A pilot to Climb/Descend at best rate Climb when instructed by a Radar (To) (Level)

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Holding

<p>Holding</p>	<p>Hold at (fix) (level) inbound track (Number) turns Right/Left (Time of Leg). Hold on the (Designated) VOR at distance (DME) (Level) inbound track (Three Digits) Turns right/Left limiting outbound Distance (Number) DME Delay less than (Number) minutes. Expect One/Two/Three Hold patterns. No delay expected. No Traffic expected. Holding for weather.</p> <p>Delay not determined (reason for delay) Delay not determined (Number) Aircraft Holding for weather improvement</p> <p>Expect onward clearance at (Time). En-route holding Expect approach clearance at (Time) Approach fix.</p>
<p>Transfer Communication</p>	<p>Contact (ATCU Callsign) on (Frequency) at (Reporting point or time). Contact (ATCU Callsign) on (Frequency). Monitor (ATCU Callsign) on (Frequency) Flight Information is available with (Agency) (On Frequency)</p>
<p>Urgency and Distress imposition of silence Acknowledgement Cancellation</p>	<p>All stations (ATSU callsign) stop Transmitting – midday.</p> <p>(A/C identity (ATSU callsign) Roger midday All stations (ATSU Callsign). Distress Traffic ended</p>
<p>Transfer to another Frequency</p>	<p>Midday (A/C identity, all other aircraft Contact (station) on (Frequency) out.</p>

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Emergency Descend	Emergency to all concerned. Emergency descend at (Aerodrome/Holding facility/Location) All aircraft below (level) within (number) mile of (aerodrome/holding point/location) leave (location or locality) immediately
Ground Movement	
Ready to start	Standby for start up, temperature (Number) Start up approved, temperature (Number) Start up at (Time) Expect start up at (Time) Expect departure at (Time) start up when ready.
PHRASEOLOGY	
Taxi Instruction	Taxi to holding point runway (destination) via (route). Taxi to stand (designation) via (route). Taxi to (location) When necessary, detailed taxiing instructions – e.g. turn left from apron and take first intersection right. After the (aircraft type) passing (left to right, etc.) taxi to holding point runway (designation). Follow the (aircraft type) (position of aircraft) Hold position.
Crossing Runway in Use	Cross runway (runway designation) at (point or crossing). Report vacated* Cross, report vacated* After the landing (aircraft type)
Active Runway prior to Take-off	Report when ready for departure Line-up * Line-up and wait (with reason if applicable). After the landing (aircraft type) Line up. Back track approved. After departure (airways clearance) Late or amended clearance. After departure climb straight ahead After departure climb heading (numbers) degrees.

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Take-Off	<p>Cleared for take-off Clear for take-off runway (designation) Instant surface wind (number) degrees (numbers) knots Clearance for take-off runway (designation) Cleared immediate take off. (Aircraft type) (distance) miles on final approach. Cleared immediate take-off Take-off Take off immediately or hold short or runway. Report airborne.</p>
Cancellation of Take-off	<p>(A/C identity) hold position, cancel – I say again cancel take-off – acknowledge. Aircraft stationary. (A/C identity) stop immediately – I say again (A/C identity) stop immediately-acknowledge Aircraft commenced take-off.</p>
Refusing Take-off	<p>I am informed that (details of hazardous condition). It appears that your planned flight is liable to endanger life. Acknowledge. Information from outside agency. You are advised that (details of hazardous conditions). It appears that your planned flight is liable to endanger life, acknowledge. Observed by the controller. Your planned flight appears to contravene legislation because (details of apparent breach if flight takes place). If you take-off I shall be required to report the facts, acknowledge.</p>
Withholding Clearance	<p>I am unable to issue take-off/landing clearance. There is (description of the obstruction and its position) in the cleared and graded areas. Your aircraft has been detained by (authority issuing detention order) I am unable to issue taxi instructions/take-off clearance.</p>
Approaching visually to land straight in	<p>Cleared straight-in approach runway (designation).</p>
Joining circuit	<p>Join right-hand/left-hand (position in circuit) Runway (designation). Report over head for a standard overhead join Number (number) follow (aircraft type and position) Extend down wind number (number) to an (aircraft type and position). Report overhead Report final Report long final Report down wind Report base leg Orbit right/left and report Again (position) Caution vortex wake. The recommended spacing is (distance) miles.</p>

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<p>Landing</p>	<p>Cleared to land runway (designation). Cleared to land runway (designation) instant surface wind (number) degrees (number) knots. Cleared low approach runway (designation) not below (number) feet above threshold elevation. Cleared low approach runway (designation) and go-around. Cleared low pass runway (designation) not below (number) feet continue approach. Land after (aircraft type), runway (designation). Cleared touch and go, runway (designation). Go around – I say again, go around (instructions) acknowledge</p>
<p>Instrument approaches to landing</p>	<p>Report visual. Cleared visual approach runway (designation). IFR plan cancelled at (time). Expect (aid) approach runway (designation). Cleared straight in (aid) approach, runway (designation). Cleared for (aid) approach, runway (designation). Cleared to (aid) overhead. Descend to minimum descent height. Report field in sight. Report aerodrome in sight Report approach/runway lights in sight. Report Beacon outbound. Report beacon inbound. Report procedure turn complete. Report base turn complete. Report outer marker. Cleared low approach runway (designation) not below (number) feet above threshold elevation. QDM (three digits) class (letter). Class may be omitted after passing initial bearing. No bearing.</p>

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Aerodrome Information	
Wind Shear	At (time) a departing/arriving (aircraft type) reported wind shear at (altitude) air speed lost/gain (number) knots strong left/right drift.
Water on Runways	Unofficial observation from the control tower/pilots report. The runway surface condition appears to be damp/wet/water patches flooded.
Meteorological Conditions	Surface wind (number) degrees (number) knots. Wind (number) number. Present weather (read from report).
Unknown Traffic	Unknown traffic (number) o' clock (distance) miles opposite direction/crossing left/right indicating above/below/similar height, if not sighted turn left/right heading (three digits). Clear of traffic. Resume own navigation.
Essential Traffic	Essential traffic information, a (direction of flight) (aircraft type) maintaining/climbing to/descending to (level) estimating (position) at (time), (any alternative clearance)
Avoiding Action	Avoiding action, turn left/right immediately heading (three digits) traffic at (number) o'clock (distance) miles opposite direction/crossing left/right (level information). Avoiding action, climb/descend immediately to (level) traffic at (number) o'clock (distance) miles opposite direction/crossing left/right (level information).
Information on known traffic	Traffic is (number) o'clock (distance) miles opposite direction/crossing left/right (number) thousand feet above/below.
Delaying Action	Delaying action. Turn left/right heading (three digits). Delaying Action, make a 360-degree turn left/right. Delaying action. Orbit left/right
Speed Adjustments	Increase/reduce speed to (number) knots. Increase/reduce speed to match (number) Reduce speed by (number) knots. Reduce to minimum approach speed, maintain present speed. Resume normal speed. No ATC speed restriction. Report air speed/mach Number Maintain (number) knots or greater. Do not exceed (number) knots, maintain (number) knots until 4NM final/outer marker.

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<p>ILS Approaches</p>	<p>This approach may be affected by clutter. Missed approach instructions will be passed in good time if necessary. (Type) approach not available due to (reason). Turn left/right heading (three digits), report established on the localizer. Closing the localizer from the left/right; report established. Descend on the ILS, QFE (pressure) millibars. Descend on the ILS, QNH (pressure) millibars, elevation (number) feet. Height should be (number) feet. Report runway/approach lights in sight. Number (number) contact tower (frequency). Contact (ATSU callsign) on (frequency) for final approach. After landing contact (ATS callsign) on (frequency).</p>
<p>Coordination between units Flight Plan Details</p>	<p>(Direction of Flight) ETC (time) flight level requested (number) aircraft identification (callsign) type (designation) Tas (Departure aerodrome) (Route) (Destination) (Flight Plan Number).</p>
<p>Clearance Request</p>	<p>(Aerodrome) request clearance for (aircraft identity)</p>
<p>Airways Clearance</p>	<p>Clearance (aircraft identity) cleared to (clearance limit) (level) (SID) SSR code (four digits).</p> <p>Clearance (aircraft identity) cleared to (clearance limit) via (route) cross (report point(s) at (level(s)) (climbing instructions) (cruising level) SSR code (four digits)</p> <p>Clearance (aircraft identity) cleared to (clearance limit) via (route) cross (reporting point(s) at (level(s) to climb when instructed by radar (cruising level) SSR code (four digits).</p>
<p>Restriction to Clearance</p>	<p>(Aircraft identity) unable to clear (Item not approved.)</p> <p>Released subject to your discretion with regard to (aircraft identity) (aerodrome) (direction of flight) departing/landing at (time). Clearance expires (time). Release not before (time). Release not before (aircraft identity plus (number of minutes). Release not before (aircraft identity) has left (level). Release not before (aircraft identity) has reported (Place). Release to maintain (number) feet below (aircraft identity). Release subject (aircraft identity).</p>

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Departure	(Aerodrome) departure (aircraft identity) departed at (time)
Approval Request	Approval request (aircraft identity) (type) expected departure from (aerodrome) at (time) requests (level) filed TAS) via (route) (point of first intended landing).
Estimate Message and Revision	(Direction of flight) estimate (aircraft identity) SSR code (four digits) (type) estimated over (place) at (time) (level) speed. (Filed TAS) via (route) (clearance limit if other than destination). Revision (aircraft identity) now estimated over (place) at (time) or other revisions, e.g. a different level.
Release to Approach Control	Inbound release (aircraft identity) SSR code (four digits) (type) from (point of departure) release at (place, time or level). Estimating (holding) facility) at (time) at (level) expected approach time (or no delay expected) contact at (place, time or level).
Read back of Message	Controller must ensure they obtain a read back of any operationally significant information contained in telephone and intercom coordination messages, including Levels Headings Speed Restrictions Airways or route instructions Runway in use SSR Codes Pressure settings Frequencies Release and contact points

SECTION VI.

REPORTING PROCEDURES

CHAPTER 1. GENERAL GUIDANCE

1.1 Introduction

The immediate action which must be taken by a controller at an operational position when an accident or incident occurs, or when an Airport Proximity Report (Airprox) is reported, is described in the preceding sections, the purpose of this section is to list for quick reference, the subsequent reporting action. It contains detailed instructions common to all Air Traffic Service units. Instructions which amplify the procedures and are peculiar to a unit will be found in the Airport Operating Manual (AOM) Part II Manual Air Traffic Services Management (MATM).

Units may find it useful to make copies of any other part of this section, for display in suitable positions in the control room.

1.2 Reports by Telephone

Some occurrences require a report to be made fairly promptly by telephone (eg. Malicious interference to VHF communications).

1.2.1 Report by Aerodrome Fixed Telecommunication Network (AFTN)

The Aeronautical fixed service should normally be used and units which are not directly connected should telephone the message to the nearest point of the service.

The Airprox report form makes provision for telecommunication copy to be completed and sent directly but all other reports by signal are to be written in block capitals (or typed).

1.3 Written Reports

All reports required from individual controllers about accidents, incidents and Airprox are to be submitted to management. Management is to collect all reports and other related documents and send them to the civil Aviation Authority. The required information is set out in the Air Navigation (General) Regulations.

The following notes about report writing may be of assistance:

- a. Relate the events in chronological order.
- b. Amplify the facts with explanations but do not attempt to pre-judge or investigate.
- c. Refer to the watch LOG, flight progress strips or any other document for accurate details of Times, Dates, Places, Aircraft Registration, ETC.
- d. Use accepted Aeronautical Abbreviations.
- e. Keep sentences and paragraphs as short as possible.
- f. Include a sketch or diagram if it will simplify the description.
- g. Write in the first person.

- h.** If you have not heard the RTF recording, endorse your report “The events described have not checked for accuracy against the appropriate RTF recording.”

1.3.1 ATS Record

All ATS records concerning unusual occurrences must be preserved until enquire or investigation have been completed. In particular.

- a.** The Duty Telecommunication Officer at an aerodrome, or system control at the ACC is to be advised of occurrences immediately
- b.** The Meteorological office or a qualified MET observer is to ask to supply a copy of the weather report for the time of the occurrence.
- c.** The original flight progress strips are to be retained at the unit or forwarded with the controllers’ report.

1.3.2 Access to Original Records

Access to original records is limited as follows to protect from damage the very important evidence which they may contain.

1.3.3 Accident

Replay of original tapes and access to original communications Logs and the contents of flight progress strips record stores is normally permitted only on the authority of the LCAA but these facilities will be made available to the Air Traffic Control unit if immediately essential to the safety of the subject Aircraft of any other (e.g., To help establish the position of the Aircraft involved, facilitating search and rescue). If the Authority of the LCAA cannot be obtained in time the Authority of the Senior Air Traffic Control Officer (SATCO) available will be accepted. Written confirmation of this Authority may be required.

1.3.4 Incidents (Including Airprox)

Replay of original tapes and access to other original records may be authorized by the LCAA or his approved representative, General Manager and Senior Air Traffic Control Officer (SATCO) or his Deputy. Occasions may arise when replay of tapes are requested in circumstances not associated with accidents, incidents or Airprox. Such outside organization (eg. Airline Representative) but in all such cases the written Authority of the SATCO will be required.

1.3.5 Disclosure of Information

The contents of reports described in this section are confidential and must neither be discussed in public nor disclosed to persons other than LCAA officials. If there is any doubt about the identity of a caller, a controller should ask for the telephone number, check that it is authentic and call back.

Members of the press and general public who make enquires about an occurrence

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should be referred to the LCAA. Additional instructions on relations with the press and general public may appear in AOM Part IV – MATM.

Controller should not approach the pilot or the Aircraft Operator if there is an alleged infringement of legislation.

CHAPTER 2. AIRCRAFT ACCIDENT, INCIDENT, AND AIRPROX REPORT

2.1 *Explanation of Terms*

In this section the term “incident” means any of the usual occurrences, involving aircraft, which are tabulated below.

Table 2.1.1 – Explanation of Terms

Incident	Explanation
Aircraft	An aircraft receives substantial damage or causes serious injury or damage to property.
Reportable Accident	An occurrence taking place between the time any person boards an aircraft with the intention of flight until such time as all persons have disembarked, in which: A - any person suffers death or serious injury while in or upon the aircraft, or by direct contact with the aircraft, or anything attached thereto; or B -The aircraft receives substantial damage.
Serious Incident	An occurrence involving circumstances indicating an accident nearly occurred.
Airprox	A situation in which, in the opinion of the pilot or a controller, the distance between aircraft as well as their relative positions and speeds have been such that the safety of the aircraft involved was or may have been compromised.
Incident involving safety	An occurrence which has endangered, or if not corrected would have endangered an aircraft, its occupants or any other person.
Incident on board and Aircraft in Flight	A commander of an aircraft in flight, in pursuance of the powers bestowed on him by the Tokyo Convention Act 1967, finds it necessary to restrain a person on board.
Hijacking	The unlawful seizure, or exercise of control, of an aircraft by use of force or threats.
Unlawful use of Aircraft	Movement on the ground and flight of an aircraft by an unauthorized person or for an illegal purpose.
Aircraft Ground Incident	An aircraft on the ground is in an emergency situation, other than an accident, and requires the attendance of the emergency services.
Unintentional use of unpaved areas.	An aircraft of 2300kilogrammes or more all up weight touches down short of the recognized landing area, overruns on landing or otherwise leaves the pave surfaces of the maneuverings area.
Aircraft Radio Equipment Fault	Radio fault including technical failure
Radio Frequency Interferences	Interruption of reception on ATC RTF frequencies by unwanted signals or atmospherics.
Ground Fault Report	A report by an aircrew member alleging that telecommunication facility is faulty (Including faulty RTF procedure).

2.2 Reporting Action

Reporting action will depend upon the circumstances of the incident. The action to be taken at aerodromes and ACCs are listed in the respective tables below.

If more than one circumstance applies to a particular incident, then the actions applicable to all appropriate circumstances must be taken.

For example, an accident in the vicinity of an aerodrome is also one that is reportable. The combined reporting action is to telephone the ACC and the aerodrome authority. Subsequent action is to submit written reports from all concerned to the LCAA.

2.2.1 Reporting Action at Aerodromes

The senior controller at an air traffic control unit at an aerodrome is responsible for ensuring that the reporting action described in Table 2.2 below (next page) is taken.

2.3 Accident Reports

2.3.1 Telephone

When telephone action is required pass as much of the following information as is available:

- a. Type, nationality and registration of the aircraft.
- b. Owner of operator.
- c. Date and time of the accident site.
- d. Nature of the flight.
- e. Location of the accident site.
- f. Number of crew and passengers.
- g. Casualties
- h. Circumstances of the accident.
- i. Lighting facilities, navigational of landing aids in use (as appropriate) and any known unserviceabilities.

2.3.2 Written Reports

General advices on writing reports are given in Chapter 1. The following details are to be included in the Report when an accident at an aerodrome is by definition, reportable:

- a. Runway in use.
- b. Lighting facilities in use and their serviceability.
- c. Relevant information on the serviceability of the aerodrome facilities and surfaces.
- d. Any damage to government or LCAA property.

Table 2.3.3 – Reporting Action

Circumstance of an Incident	Reporting Action (by telephone) to	Subsequent Action
Aircraft Accident in the vicinity of The aerodrome	ACC watch manager	from all concerned to the LCAA
Additionally if an accident is Reportable	Aerodrome authority (but see local emergency order) ACC can assist.	from all concerned to the LCAA
Involves Approach and Navigation And communication facilities	Duty Telecommunications officer At the aerodrome	See also ground fault report
Unintentional use of unpaved Areas	Aerodrome Authority	
Airprox Report	ACC watch manager Aircraft Operators other ATSUs involved	From all concerned to the LCAA
Serious Incident (including MAY-DAY and Pan messages)	ACC watch manager aerodrome authority	From all concerned to the LCAA
Air Traffic Services may be subject To criticism	ACC watch manager head of ATSUs	From all concerned to the LCAA
Likely to give rise to public interest	ACC watch manager head of ATSUs	
Hijacking and the unlawful use of aircraft	ACC watch manager Aerodrome Authority (according to MATS part2)	From all concerned to the LCAA
Circumstances of an incident	Reporting Action (by telephone) to	Subsequent Action
Bomb warning involving and aircraft Os received	Aircraft operators ACC watch Manager (see local emergency order) Next ATSU concerned with flight (if Aircraft is airborne)	From all concerned to the LCAA
Incident on board an Aircraft in Flight (Aircraft intends to land)	Aerodrome Authority Aircraft Operators	From all concerned to: Aviation Regulation Enforcement and the LCAA
Incident on board an aircraft in flight (Aircraft does not intend to land)	ACC watch manager	Confirm with signal priority 'FF'
More than one ATSU involved	All other ATSUs involving stating: 'This incident will be subject of an Investigation'	From all concerned to the LCAA
Incidents involving Safety	ACC watch manager (if search Action is required).	From all concerned to the LCAA
Aircraft Radio Equipment fault	Duty Telecommunication officer	Send completed FSS
(Round Fault Report Telecommunications Services)	Duty telecommunication officer at aerodrome	Send completed FSS
Radio Frequency Interference Report	Duty Telecommunications officer	Send completed FSS
Alleged Infringement of Legislation		Aviation Reg Enforcement. From Concerned to the LCAA (clearly annotated that action has been taken).

2.3.4 Serious Incident Report

A serious incident is defined as one involving circumstances which indicate that an accident nearly occurred. As a measure of guidance if a pilot declares an emergency, or an Air Traffic Control Officer (ATCO) believes one should have been declared, then a serious incident report should be filed. The purpose of this reporting action is to provide an early degree of awareness to LCAA that a serious incident may have occurred.

The following list provides a number of typical examples of those incidents likely to be considered serious. The list is not exhaustive and serves only as guidance to the definition of a serious accident. LCAA is the final arbitrator in deciding whether the incident will be considered serious and so if doubt exists an incident should be reported rather than excluded:

- a. near collisions requiring an avoidance maneuvers to avoid a collision or an unsafe situation or when avoidance action would have been appropriate;
- b. controlled flight into terrain only marginally avoided;
- c. Aborted take-offs on a closed or engaged runway;
- d. Take – offs from a closed or engaged runway with marginal separation from obstacle(s);
- e. Landings or attempted landing on a closed or engaged runway;
- f. Gross failures to achieved predicted performances during take-off or initial climb;
- g. Fires and Smoke in the passengers compartment, in cargo compartments or engine fires, even though such fires were extinguished by the use of extinguishing agents;
- h. Events requiring the emergency use of oxygen by flight crew;
- i. Aircraft structural failures or engine disintegrations not classified as an accident;
- j. Multiple malfunctions of one or more aircraft systems serious affecting the operation of the aircraft;
- k. Flight crew incapacitation in flight;
- l. Fuel quantity requiring the declaration of an emergency by the pilot;
- m. Take off or landing incident (incidents such as under-shooting, over running or running off the side of runway;
- n. System failures, whether phenomena, operations outside the approved flight envelope or other occurrence which could have caused difficulties controlling the aircraft;
- o. Failure of more that one system in a reduced system mandatory for flight guidance and Navigation.

Where an Airprox is filed, there is no need to follow the “serious accident” reporting procedures as the details will be sent by the normal report system to LCAA. Reporting procedures will commence as soon as practicable after the incident and in all cases, no longer than 96 hours after the occurrence. It is accepted that all details may not be available soon after the incident in which case the available information should be sent and the additional details forwarded as soon as possible there after. Clearly, if a serious incident occurs and ATC is not informed by the crew, then the onus rests with the flight crew to

ensure that reporting action is taken.

2.3.5 Telephone

When telephone action is required pass as much of the following information as available:

- a. Type, Nationality and Registration of the Aircraft.
- b. Owner or operator
- c. Date and time of the serious incident
- d. Nature of the flight
- e. Location where the serious incident took place.
- f. Number of crew and passengers
- g. Casualties
- h. Circumstances of the serious incident.
- i. Where appropriate, lighting facilities, navigation or landing aids in use and any known unserviceabilities.

2.3.6 Aircraft Proximity Reports (Airprox Reports)

All Airprox reports will be handled by the LCAA. Where an Airprox occurs inside controlled airspace, an investigation will be initiated and handled by the safety division/section of the LCAA.

The Air Traffic service unit originating an Airprox report is to send a signal containing as much information as possible using the Airprox report form. This complies with the Mandatory Occurrence Reporting procedure (MOR).

A pilot may file an Airprox report on the RTF or, after landing, by telephone or in person. The SATCO at an air traffic control unit receiving an Airprox report, or information that a pilot intends to file a report after landing, is to send a preliminary signal, containing as much information as possible. This complies with the MOR.

This signal is to be sent to the parent ACC as confirmation of the telephone message already passed by the originating air traffic control unit. The watch supervisor at the ACC is to check that the details of the telephone message and signal are the same and been correctly addressed.

Air traffic service units at Aerodromes should hold stocks so that they can be supplied to pilots if required.

Controllers, when filing an Airprox, shall use the AIRPROX form. Pilots of aircraft involved in an Airprox initiated by a controller should be informed by the controller or the SATCO, as soon as possible, that an Airprox is being submitted by ATC.

2.3.7 Mandatory Occurrence Reports (MOR)

Information and Guidance on the MOR scheme is contained in AOM Part II.

A holder of an Air traffic controller's license is to report, within 96 hours, any

occurrence which has, or if not corrected would have, endangered an aircraft, its occupants or any other person. The Air Navigation order and contain guidance on what is a reportable occurrence, but ultimately the controller involved will have to use his own judgment.

To enable other reports to be completed without delay, controllers should, if possible, inform the operators and other Air traffic control unit involved at the time. If telecommunications services and facilities are involved, the telecommunication manager or the duty Tels officer should be advised of the circumstances of the occurrence without delay.

Controllers are to report all occurrences regardless of the category or nationality of the Aircraft.

2.3.8 Reporting Procedure

All ATC initiated MORs are to be filed using standard form. The forms are disseminated as follows:

- a. The original is sent to the LCAA Safety Division/section. It is the responsibility of the reporting controllers to ensure that this copy is sent.
- b. The first copy is sent to the local ATS management, except for confidential MORs when this copy is destroyed.
- c. The second copy is destroyed by the reporting controller.

The safety division/section will not acknowledge individually every report, but will acknowledge confidential reports and specific reports on request.

When a confidential report is filed the name of the originator will remain confidential to the safety division/section, except when the occurrence is additionally reported by another agency (e.g. the operator). In these circumstances, the application of normal investigation procedures will preclude the preservation of confidentiality.

If the controller considers that the incident he is reporting under the MOR scheme may have involved a breach of legislation, he is advised to seek the views of the Airport Authority. If after consultation it is decided that report should be sent to LCAA accompanied by a copy of the completed form.

Where an extra copy of the form is required a photocopy of the original is acceptable. If no photocopy facilities are available then another form should be completed to be an exact copy of the original.

2.3.9 Incidents on Board an Aircraft in Flight

If the commander of an Aircraft finds it necessary to restrain a person on board an Aircraft in Flight he may report the matter to an Air Traffic control unit. The report will normally contain the following items:

- a. the Nationality and registration marks of the Aircraft.
- b. the pilot-in-command's name.
- c. the name and nationality of the person under restraint and the details of his journey.
- d. A description of the incident in which the person was involved and the position of the aircraft at the time.
- e. The names of up to three witnesses.
- f. The ETA at the Aerodrome of intended Landing.

Controllers should forward the details on form to the Flight Standard Safety Division/Section with a copy to director general-CAA

2.3.10 Matter Allegedly Dropped by Aircraft

A complaint alleging that a matter has fallen from an aircraft is to be treated as an incident involving safety. All reasonable efforts are to be made as soon as possible to identify Aircraft which might have been responsible. The Aid of the watch supervisor at the ACC may be enlisted. It should be recommended that military Aircraft, often Civil Control or means of identification, may have been responsible. Controllers must not express opinions as to the likely source of the falling matter to the person reporting the incident.

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CHAPTER 3. INFRINGEMENT OF LEGISLATION

3.1 Introduction

Offences against the civil aviation act follow the air navigation order. It's supporting regulations or procedures may be one of three basic types:

- a) An offence against the rules of the Air and Air Traffic control regulations or against published procedures.
- b) An offence against regulations based on safety.
- c) An offence against regulations having no direct bearing on safety (e.g. requirements for registration and markings, carriage of documents or, in customs requirements).

Offences in category (c) above should be reported by telephone to the nearest representative of the appropriate authority (e.g. custom) or, in cases of doubt, to aviation regulation enforcement.

Controllers should report offences in categories (a) and (b) using forms in accordance with written report below.

3.2 Tracing Action

If the offending aircraft has not been identified but is on a Radar display it is to be tracked if possible, until it appears to be landing. Correlation of the track and time with the movements at the appropriate aerodrome should be attempted so that identification can be made. If the pilot's name is volunteered, it should be noted in the report.

There is no requirement to speak directly to the pilot concerned. If however, contact is made, he shall not be invited or persuaded to give an explanation but if he does so voluntarily, it shall be written down in his exact words and not paraphrased or interpreted. This does not constitute a statement under caution but it does form a very important link in the chain of information upon which to decide whether to prosecute. The reporting officer should endorse the form with the date and time of completion.

If the pilot states that special circumstances existed, e.g. that service was being provided by another Air Traffic service unit efforts should be made to corroborate the Statement.

If the pilot asks what action is going to be taken, the controller should say that he is endeavoring to trace the identity of an Aircraft involved in an incident and that the circumstances of the flight are being reported to LCAA headquarters for consideration of action to be taken.

Controller should NOT, in conversation with pilots:

- a. specify the article, rule or regulation apparently infringed,
- b. give any form of admonition.

To do so may inhibit action by LCAA investigation officers.

3.3 *Written Reports*

Alleged infringements of legislation are to be reported on report form. Details under the heading 'General Information' should be inserted if they are known copies of statements and relevant supplementary evidence, such as log extract and flight plans, should be attached.

Staffs having first-hand knowledge of the incident are to type their statements on form. It should be noted that on this occasion code groups and aeronautical abbreviations are not to be used. RTF recordings should be preserved in case a transcript is required.

3.3.1 Forwarding Reports

Reports on forms are to be sent to LCAA with a copy to ATC investigations. It is essential that any report which may merit prosecution is dealt with expeditiously. If delays occur in the preparation of supporting documents, the CA 939 is to be forwarded at once and endorsed 'Additional documents to follow'.

Where the offence has had a bearing on safety, i.e., the offending aircraft has been involved in an Airprox or similar incident, or has caused disruption of normal air traffic control services:

- a. The form CA 939 and copy is to be annotated to distinguish it from other less serious cases by fixing a prominent red star or disc in the top right-hand corner of the form.
- b. A somewhat fuller description of the incident is to be provided, in particular identification of all aircraft involved together with relative tracks and times;
- c. A statement as to the degree of actual danger involved is to be included in the report.

3.4 *Military Aircraft*

Although the Air navigation legislation does not normally apply to military aircraft (of any nationality) all apparent contraventions are to be reported.

When an unidentified aircraft (suspected as being military) has apparently contravened regulations of the AIS (military) should be requested to trace search action to establish its identity. The reason for the requesting the search must be clearly stated to distinguish it from the search action following an Airprox report.

CHAPTER 4. MISCELLANEOUS REPORTS

4.1 *Bird Strikes*

The completion and processing of bird strike reports is the responsibility of the aerodrome authority, but controllers should be aware of local arrangements for the input of information and should, where appropriate, encourage pilots to follow the procedure. This complies with MOR procedure.

4.2 *Maritime Incidents*

4.2.1 Disaster at sea

Pilot witnessing a disaster at sea or seeing a disaster not previously notified is requested to report the incident to any air traffic control unit as quickly as possible.

4.2.2 Maritime Pollution

Pilots sighting substantial patches of oil or possible harmful substances are asked to make report to the air traffic control unit with whom they are in communication, or to the appropriate FIR controller. Reports on RTF will be prefixed "oil pollution report" or "pollution report" if a harmful substance other than oil is suspected.

A controller receiving a report should obtain as much information as possible to complete a report in the format shown below:

- Date and time pollution observed and identity of aircraft reporting,
- Position and extent of pollution,
- Tide, Wind speed and direction,
- Weather conditions and sea state,
- Name and nationality, or description, including any distinctive marking, of any vessel seen discharging oil or other harmful substances; also assessment of estimated length of pollution in her wake.
- The identity of any other vessels in the immediate vicinity and whether photograph taken.

4.2.3 ATC Action

Any air traffic control unit receiving such reports should pass them without delay to RFIR ACC. The ACC watch supervisor receiving such a report should pass this as soon as possible to the appropriate coastguard maritime rescue coordination center.

Similar procedures should be followed if a pilot makes such a report by telephone after landing.

4.3 Unidentified flying objects

A controller receiving a report about an unidentified flying object must obtain as much as possible of the information required to complete a report in the format shown below:

Report of Unidentified Flying Object

- a. Date time and duration of sighting
- b. Description of object
- c. Exact position of observer
- d. How observed
- e. Direction in which object was first seen
- f. Angular elevation of object
- g. Distance of object from observer
- h. Movement of object
- i. Meteorological conditions during observations
- j. Nearby objects
- k. To whom reported
- l. Name and address of informant
- m. Any background information on the informant that may be volunteered,
- n. Other witnesses
- o. Date and time of receipt of report

The completed report is to be sent by the originating Air traffic service unit to the Ministry of Defense (MOD).

4.4 Malicious interference to VHF communications

Controllers should be aware that there has been an increasing number of reports concerning the malicious use of aeronautical VHF mobile band by persons who deliberately impersonate Air Traffic control officers and the types of message they broadcast. When such transmissions are made they may sometimes be identified by:

- a. A change in the individuality of the transmissions, i.e. the controller's voice characteristics are not those previously experienced.
- b. The message transmitted is out of context with the expected next message; it is obviously in error or uses incorrect phraseology.
- c. The message is only transmitted for a short time only and not repeated when queried.
- d. The signal is sometimes received only by the pilot or controller, not both.

When illegal transmissions are suspected controller should ensure that either the duty tells officer, or ATC, contact the bureau of telecommunications. They are part of the post and telecommunication ministry and will seek to track down the source of the transmission and take appropriate legal action.

For this process to work, it is essential that the bureau of telecommunications is informed as soon as practicable. They will require to know the content, character,

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type and location where the transmissions were received.

It is important that the best possible evidence is made available for any potential prosecution. Original tapes of communications received by the ground must be preserved where possible. Advice from the LCAA can be obtained if ATC provides are unclear on what to preserve when such arise.

In all cases of interference, the ATCO shall complete an MOR form.

SECTION VII.

ASSOCIATED SERVICES

CHAPTER 1. METEOROLOGICAL SERVICE

1.1 Briefing of controllers on meteorological services

Prior to taking over watch, controllers shall obtain full information regarding the weather to be expected during the period of their watch. This may be accomplished by a study of forecasts from the PUMA Meteorological satellite Data for Africa by RIA meteorological office. If clarification is necessary, a briefing from the designated forecast unit will be supplemented.

1.2 Explanation of Terms

The use of the words "CLOUD BASE" in meteorological reports and aerodrome forecasts means the height of the cloud base of any cloud above elevation.

The "Meteorological Authority" for civil aviation in the Republic of Liberia is the Director of (MET) Air Navigation Services (ANS), Liberia Civil Aviation Authority.

1.3 Supply of Information

Meteorological forecasting services to ATSU are provided by Meteorological Office/Roberts International Airport as received from the PUMA Satellite Station.

Meteorological office observers provide aerodrome weather reports at RIA. As a general rule controllers shall only transmit to aircraft information that has been supplied, or agreed on, by the meteorological office.

The explanations are:

- a. Indicated wind direction and speed where anemometer indicators are fitted in the control room.
- b. RVR observation.
- c. Sudden or unexpected deterioration of which, in the interest of safety, controllers consider it advisable to warn aircraft immediately and consult with the meteorological office afterwards.
- d. Information from an aircraft in flight may be passed to other aircraft when a controller considers that it may be useful to them. Whenever this is done the controller shall state the information originated from an aircraft in flight and time at which the observation was made. Aircraft report of meteorological conditions which affect safety, e.g. severe rain showers, thunderstorm with lightning, etc. shall always be passed to other aircraft likely to be affected.

Information on severe turbulence is to be communicated as soon as possible to the duty meteorological forecaster who will decide whether the condition warrant

the issuance of a special aerodrome weather report and/or SIGMET.

Controllers shall ensure a close watch is kept on the weather and report any sudden or unexpected deteriorations or improvements observed or obtained from pilots, to the duty meteorological office observer on the aerodrome or forecaster at the weather station without delay. Controllers may be asked to obtain weather information from aircraft.

1.3.1 Checking Information

If time allows current weather reports should be compared with previous reports and the prevailing conditions. Differences which are difficult to reconcile with the observed conditions or barometric pressures which are not consistent with the apparent tendency, should be confirmed with the duty meteorological observer before transmission to aircraft.

1.3.2 Aerodrome Weather Report

The METAR form is the standard form used by the meteorological observers to communicate routine and special reports to ATC.

The same METAR form is used to communicate special weather information to ATC.

Acknowledgement

Meteorological information sent to ATC by phone due to equipment breakdown must be acknowledged.

1.3.3 Recording Information

All weather reports, both routine and special must be recorded either in the meteorological register or other method (so approved by authority). Any information except surface wind measurements that is at variance with the official weather report and is passed to aircraft or operators will be recorded in the approved manner.

1.3.4 Aerodrome Meteorological Reports (Routine)

Routine reports are issued for an aerodrome hourly or half hourly as required and contain the items shown in the table below. The time of observation shall be in UTC.

ITEM	
Surface Wind	Direction in degrees true and speed in knots, usually averaged over 10 minutes. In addition, if appropriate to the same 10 minutes period: <ul style="list-style-type: none"> A. Extreme in direction when the variation is 60 degrees or more and the mean speed exceeds 3 knots; B. Maximum wind speed when it exceeds the mean by 10 knots or more
Surface Visibility	Increments of 50 meters when less than 500 meters or 100 meters when 5000 meters or less. In whole KM when greater than 5KM. RVR shall be included when measured.
Weather	At the time of observation, e.g drizzle, fog, heavy rain e.t.c
Cloud	The following layers showing the amounts in terms of few, scattered, broken, overcast or in oktas and bases in feet but limited to cloud bases which are not more than 5000 feet above aerodrome elevation: <ul style="list-style-type: none"> A. The lowest individual layer whatever the amount B. The next highest of at least 3 oktas C. The next highest of at least 5 oktas Towering cumulus and cumulonimbus will always be specified whatever the amount and height when cloud base is not discernible due to fog, snow, etc. sky "obscured" is reported. See remarks section for additional reports of measured cloud base
CAVOK	This term replaces the entries for visibility, weather and cloud when the following conditions apply simultaneously: Visibility 10 Km or more. No significant weather at or in the vicinity of the aerodrome. No cloud below a level of 5000 feet above aerodrome elevation and no cumulonimbus cloud at any level
QNH	Rounded down to the nearest whole millibar (e.g. 1014.9 becomes 1014
QFE	Rounded down to the nearest whole hectopascal.. At aerodromes where more than one elevation is notified (e.g. threshold elevation for an instrument runway) the QFE is supplied to the nearest tenth of a hectopascal.. The Air Traffic Control Unit will convert as appropriate and round down the resultant to the nearest whole hectopascal.
Air Temperature and Dew Point	In degrees Celsius (centigrade)
Remarks	Measured cloud base is shown under this heading at aerodromes where approach cloud base recorders are installed on the approach to a runway. These figures are supplied when the base is 1000 feet or less irrespective of the runway in-use cloud amounts are not shown.
Note	In any report to aircraft for take-off and landing, direction is to be expressed in degrees magnetic, and where averaging is appropriate, the period shall be 2 minutes, in addition, the extremes in direction and speed (gust and lull) during the past 10 minutes shall be provided.

1.4 Aerodrome Meteorological Reports (Routine)

METAR - Is the name of the code for an aviation routine weather report. A METAR is issued at hourly or half hourly intervals

SPECI - Is the name of the code for an aviation selected special weather report. A SPECI can be issued at anytime when certain criteria are met

Both the METAR and a SPECI have the same code form and both may have a TREND forecast appended aviation weather reports (METAR or SPECI) contain the following information in the order shown.

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IDENTIFICATION GROUPS	<p>This will have three parts:</p> <ul style="list-style-type: none"> • The report code name (METAR or SPECI) • The ICAO location indicator of the reporting station • The day of the month and time of the observation in hours and minute, UTC (coordinated interval time), followed by the letter Z <p>EXAMPLE: SPECI GLRB 111325Z</p>				
SURFACE WIND	<p>Normally there will be a five figure groups to indicate the ten minute mean wind, followed by an abbreviation to indicate the wind speed units used. The first three figures indicate the wind direction and the last two the wind speed.</p> <p>EXAMPLE: 32015KT</p>				
SURFACE VISIBILITY	<p>When there is no marked directional variation in visibility, the minimum horizontal visibility will be reported in meter using four figures</p> <p>EXAMPLE 4000</p> <p>NOTE: Directional variations are not considered MARKED unless the minimum visibility is less than 5000 meters and the variations are at least 50% of the minimum visibility. When there is a marked directional variation in visibility, the reported minimum visibility will be followed by one of the eight points of the compass to indicate the direction of this visibility.</p> <p>EXAMPLE 4000 NE</p> <p>If the lowest visibility is observed in more than one direction, then the most operationally significant direction shall be reported.</p> <p>EXCEPTION</p> <p>When the minimum visibility is less than 1500 meters and the visibility in another direction is more than 5000 meters, the maximum visibility and its variation should also be reported.</p> <p>EXAMPLE 1400SW 6000N</p>				
PRESEND WEATHER	QUALIFIER	WEATHER PHENOMENA			
	INTENSITY OR PROXIMITY	DESCRIPTOR	PRECIPITATION	OBSERVATION	OTHER



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	<p>-Light</p> <p>Moderate (No qualities)</p> <p>+ Heavy (Well developed) in the case of dust/sand whirls)</p> <p>(dust devils and funnel clouds)</p> <p>VC in the vicinity</p>	<p>M1 Shallow</p> <p>BC Partial</p> <p>PR Partial (Covering part of the aerodrome)</p> <p>DR Low drifting</p> <p>BL Blowing SH Shower(s)</p> <p>Ts Thunderstorm</p> <p>FZ Freezing (super cooled)</p>	<p>DZ Drizzle</p> <p>RA Rain</p> <p>SN Snow</p> <p>SG Snow grains</p> <p>IC Ice crystals</p> <p>PE Ice pellets</p> <p>GR Hail</p> <p>GS Small hail and/or snow pellets</p>	<p>BR Mist</p> <p>FG Fog</p> <p>FU Smoke</p> <p>VA Volcanic ash</p> <p>DU Widespread dust</p> <p>SA Sand</p> <p>HZ Haze</p>	<p>Po Dust/sand Whirls (dust devils)</p> <p>SQ Squalls</p> <p>FC Funnel clouds (tornado or water spout)</p> <p>SS Sand storm</p> <p>DS Dust storm</p>
CLOUDS	<p>Clouds groups consist of six characters under normal circumstances. The first three indicate cloud amount with:</p> <p>1/8 to 2/8 being reported as FEW (Few)</p> <p>3/8 to 4/8 “ SCT (Scattered)</p> <p>5/8 to 7/8 “ BKN (Broken)</p> <p>8/8 “ OVC (Overcast)</p> <p>The last three characters indicate the height of the base of the cloud in units of 30 meters or 100 feet up to 3000 meters (10000 feet) and in steps of 300 meters (1000 feet) above</p> <p>EXAMPLE 3/8 of Stratocumulus with a base of 1850 feet will be encoded:SCT18</p> <p>CLOUD TYPES</p> <p>Types of clouds other than significant convective clouds are not identified. Significant convective clouds are: Cumulonimbus indicated by CB and Cumulus Congestus of great vertical extend indicated by TCU. The contraction TCU taken from “Towering Cumulus” is an ICAO abbreviation used to describe this type of cloud</p>				
CAVOK	<p>The word is used to replace the visibility, present weather and cloud groups when:</p> <ul style="list-style-type: none"> • The visibility is 10Km or more; • There is no cloud below 1500 meters (5000 feet) or below the highest minimum sector altitude, whichever is greater and no cumulonimbus; • There is no significant weather phenomena 				
TEMPERATURE & DEW POINT	<p>The observed temperature and dew point temperature each as two figures rounded to the nearest whole degree Celsius, should be reported next.</p> <p>Temperature below 0 degree Celsius will be preceded by M to indicate minus</p> <p>EXAMPLE: MINUS 9.5 DEGREES CELSIUS IS REPORTED AS M09</p> <p>NOTE: Air temperature and dew point values of .5 degrees will be rounded up to the higher whole number</p> <p>EXAMPLE: AIR TEMPERATURE-9.5 DEGREES CELSIUS, DEW POINT-3.3 DEGREES CELSIUS, WILL BE REPORTED AS 10/O3</p>				
PRESSURE. QNH	<p>The last group of the main part of the report should indicate the QNH rounded down to the nearest whole hectopascal. This group starts with the letter Q followed by four figures.</p> <p>EXAMPLE: A QNH OF 995.6 hpa IS REPORTED AS Q995</p> <p>NOTE: In some countries inches of mercury are used as the unit of QNH. In this case the indicator will be A (instead of Q)</p> <p>EXAMPLE: A QNH OF 30.5 INCHES IS REPORTED AS A 3005</p>				

CHAPTER 2. TELECOMMUNICATION SERVICE

2.1 *The Aeronautical Mobile Service*

The Aeronautical mobile service provides the radio telephony facilities necessary for the provision of air traffic services.

2.2 *Automatic Recording*

Transmission on air traffic frequencies are recorded in accordance with the air navigation order. Controllers should appreciate that the intercommunication facility associated with a radio frequency may also be recorded.

Access to original records is limited to protect from damage the very important evidence which they may contain.

If a breakdown of equipment prevents automatic recording, controllers should be prepared to assist the telecommunication staff by keeping a temporary log of the frequency affected. This activity will, of course, take second place to a controller's normal duties and must not be allowed to interfere with their proper execution.

2.3 *Copies of Communication Records*

Copies of tapes, communications logs and transcriptions are to be made available when requested by the LCAA.

2.4 *Radio and Standards*

2.4.1 Routine Checks

Procedures for checking radio equipment vary from unit to unit, at some telecommunications staff checks the equipment serviceable but at others controllers are required to carry out the checks themselves.

2.4.2 Routine Maintenance

Routine weekly and daily maintenance of radio facilities is carried out at specified times. Periods of more than one hour are published in the Liberia AIP and will be strictly adhered to. Daily periods (normally less than one hour) are not necessarily published but before switching of an aid the maintenance staff will communicate with the Air Traffic Unit to ensure, as far as can be ascertained, that is not been used or about to be used by aircraft.

Should weather or traffic conditions indicate that an aid is likely to be needed during a specified maintenance period, the controller shall contact the station telecommunication officer as early as possible to be carried out at a more convenient time. When a request for a particular aid is received for an aircraft due to arrive during a maintenance specified period, the controller shall consider the weather and alternate aids available to the aircraft before asking the telecommunications section to defer.

2.4.3 Testing

The station telecommunication officer may on occasion request that an aircraft be asked to carry on a test of its radio. Such tests are of importance and controllers shall always endeavor to arrange for them to be carried out, subject to weather and traffic conditions.

New installations, however, until they are declared operationally serviceable and existing ones requiring calibration after unserviceability, may only be flight tested by aircraft approved by the authority.

2.4.4 Flight Checking

Flight checking procedures must be provided.

2.4.5 High Winds

If high winds exceed the maximum normally permissible for operation of a particular equipment, the SATCO shall inform the station telecommunication office. However, if the SATCO decides that the equipment should continue in use because of urgent operational requirements, the station communications officer shall be informed and the fact recorded in the watch log. It should be noted, however, that some equipment will switch off automatically when the wind speed reaches the limit.

2.4.6 Aeronautical Fixed Service

Teleprinter messages originated by air traffic control will only be accepted by the aeronautical fixed service if they conform to the requirements specified in the aeronautical section of the FIR AIP. ICAO standard form is to be used for flight plan, departure and all other teleprinter messages.

2.4.7 Serviceability of Equipment

Controllers shall report defects on the serviceability of any telecommunication facility to the station telecommunications officer.

Ground fault repairs made by aircrew members should be passed to the station telecommunication office immediately. If an aircrew criticizes any part of the telecommunications officer organization, controllers shall not discuss the matter before but refer it to the station telecommunications officer. If successive reports from aircraft confirm the fault but the ground indications suggest that the facility is serviceable, the station telecommunication office and the SATCO, are to decide, in consultation, the new status of the aid.

Control room equipment should not be tampered with in an attempt to investigate or remedy a fault. Unserviceable telephone equipment should be reported to the station telecommunication officer. RTF equipment and emergency telephone shall be tested at regular intervals as agreed upon with the station telecommunications officer; these tests should be conducted at least daily.

2.4.8 Aircraft Radio Equipment Fault Report

Aircraft radio equipment faults, as described in Section VI, shall be reported to system control or the duty telecommunications officer for action

2.5 *Withdrawal of Approach Aids*

In the event of a reportable accident occurring to an aircraft during final approach and landing in which any aid has been used, no further approaches using that aid should be permitted unless it is obvious that the use of the aid was not contributory to the accident. Telecommunications staff, where available, should be advised immediately so that they can initiate ground checks and other essential action

2.6 *Restoration of Approach Aids*

Responsibility for deciding that the ground checks are satisfactory and that the facility may be returned to service rests with the duty telecommunications officer, where employed in consultation with air traffic control, or with the aerodrome authority at aerodromes.

Where necessary, post accident flight inspection will be arranged by the duty telecommunication officer or the aerodrome authority.

CHAPTER 3. AERONAUTICAL INFORMATION SERVICE

3.1 Introduction

The function of the Aeronautical Information Service (AIS) is to:

- a. Collect, collate, edit and disseminate aeronautical information, necessary for the safety and efficiency of air navigation, or interested parties. This includes LCAA, ATS providers, operating companies, aircrew, flying clubs and other aviation related organizations;
- b. Receive post flight information.

3.2 Central Office

The work of the central office, AIS headquarters, is located in Conakry, Guinea. It does the following.

3.3 AIS Operations

The main functions of AIS Operations are as follows:

- a. Preparation and issuance of civil, military and NOTAM from three countries;
- b. Preparation of AFTN navigational warning summaries for international distribution, either by AFTN or post;
- c. The Central Bulleting Service (CBS) maintains and edits a computerized database of information on selected aerodrome enabling the creation of area bulletins for pre-flight information briefing. This information is transmitted via civil aviation packet to aerodromes daily.

The Roberts FIR maintains records of all aviation facilities. This information is used to prepare the Integrated Aeronautical Information Package which consists of the following elements:

- a. AIP including amendment service (AIRAC and Non-AIRAC permanent changes)
- b. AIP supplements (temporary information)
- c. NOTAM (distributed by AFTN)
- d. AIC

The Roberts AIS central office is also responsible for the maintenance and updating of CAP 550 random flight plan AFTN address book. This simplifies the addressing of flight plans by using AFTN codes (collective) which in most cases include all FIR/ACC addresses en-route to the destination airport.

3.4 Overseas Information

The overseas library section maintains the records and Aeronautical Information Publications for most overseas countries. Foreign information is re-promulgated, after translation where needed to interest parties.

Overseas non-scheduled flight clearance guide is published by AIS as an aid to pre-flight briefing and planning by non-scheduled operators for obtaining overflight and diplomatic clearance over foreign states.

3.5 Aerodrome Flight Briefing Units

Flight Briefing Units (FBU) located at certain major airports maintain a full bulletin information service for the first route segment for flights operated from the airport concerned. Additional bulletin information may be obtained on request.

3.6 Amending the Aeronautical Information Publication

Permanent changes to the AIP will be promulgated by reprint pages which will be issued as:

- a. AIRAC AIP amendment; and
- b. AIP amendment (Non-AIRAC).

These amendments will be published every 28 days and in accordance with the AIRAC calendar.

3.6.1 Sponsors of Amendments to the AIP (AIRAC and Non-AIRAC)

Each section of the AIP is sponsored by the relevant policy holder. The sponsor will complete a form CA 933 and send this to the AIS publications coordinator who will arrange for an AIP amendment to be issued. Contributors should direct their information through the appropriate policy department, or follow locally agreed procedures.

3.6.2 AIRAC AIP Amendment

Operationally significant changes will be published only as AIRAC AIP amendment and in accordance with AIRAC procedures.

Each AIRAC AIP amendment will have a pink colored cover sheet (to differentiate it from a non-AIRAC AIP amendment) and will briefly describe the content of changes. It will also indicate NOTAM which have been incorporated.

The new pages should not be inserted to replace the current pages in the AIP until the effective date of the changes.

3.6.3 AIP Amendment (Non-AIRAC)

The AIP amendment will normally only include non-operating significant changes. The cover sheet will only briefly describe the content of changes and list NOTAM that have been incorporated.

3.6.4 AIP Supplement

The AIP supplement will contain items of a temporary nature only. To be included in the AIP supplement changes must be of a long duration (three months or longer) or supplementary information of operational significance containing comprehensive text and/or graphics e.g., air exercise, major work in progress etc.

AIP supplement will be issued every two weeks and pages will remain colored green in order to be conspicuously different from other AIP pages. They should be kept in the AIP binder.

A check list of current AIP supplements will be issued every two weeks.

3.7 NOTAM

All other operational information not covered by AIP supplement will be issued as a NOTAM (by AFTN) including changes or operational significance (permanent or temporary) which need to be introduced at short. Such changes will be superseded as soon as possible, by AIP amendment or AIP supplement as necessary (see above)

3.7.1 Operationally Significant Changes (Trigger NOTAM)

All operational changes issued by AIP amendment and AIP supplements will be additionally flagged up by NOTAM. The NOTAM will be issued approximately one week after the publication of the AIP amendment/supplement giving an abbreviated description to the significant changes, effective date and the reference number to the AIP amendment or supplement. NOTAM becomes a “trigger”, to ensure that a reminder is included in the appropriate Pre-flight Information Bulletins.

These “Trigger” NOTAMs will become effective on the dates of the change and remain valid for 15 days for permanent changes and for the duration of temporary changes.

3.7.2 NOTAM Service

NOTAMs are distributed to stations connected to the Aeronautical Fixed Telecommunications Network (AFTN) and identified by a suffix letter:

- NOTAM N—Contains new information;
- NOTAM C—Cancels a previous NOTAM;
- NOTAM R—Replaces previous NOTAM

A NOTAM is normally originated when urgent information of an operational nature needs to be distributed rapidly. Parochial information which can be imparted locally to operators and which will not preclude safe operation of a flight, or

influence decision by aircrew on possible diversion requirements, should not be promulgated by NOTAM. Items which come into this category include the following:

- a. Routine maintenance work on aprons and taxiways which does not affect the safe movement of aircraft;
- b. Runway marking work, when aircraft operations can safely be conducted on other available runways or the equipment used can be removed as necessary;
- c. Temporary obstructions close to the aerodrome that do not affect the safe operation of aircraft;
- d. Partial failure of aerodrome lighting facilities where such failure does not affect aircraft operations;
- e. Partial failure of air-ground communications when suitable alternative frequencies are known to be available are operative;
- f. The lack of apron marshalling services or road traffic controls signs on the aircraft movement areas;
- g. Parachuting in Class F or G airspace under VFR or when controlled under promulgated sites or within danger or prohibited areas;
- h. Other information of a similar nature.

3.7.3 NOTAM Initiation

A NOTAM request initiated at the Air traffic Control unit shall be teleprinted, faxed or telephoned to the AIS central officer accordingly and shall take the following form:

The acronym NOTAM

- Any local seal number the originator may wish to apply; the location of the facility or condition being reported using the ICAO place name, four letter abbreviation if possible;
- The Plain Language Message:
- Any date and time applicable to the condition reported expression being in standard UTC 8 figure group format

3.8 *Aeronautical Information Circulars*

An aeronautical Information Circular (AIC) is issued to promulgate any information, which either does not qualify for inclusion in the AIP or is not operationally specific and therefore eligible for supplement status. Current AICs contain advice, warnings, forecasts or change, explanatory advice on technical administrative or legislative matters, notification of changes to maps, charts, danger area, etc.

SECTION VIII.

ADMINISTRATION & LICENSING

CHAPTER 1. CONTROL ROOM ADMINISTRATION

1.1 Watch Procedures

a. Watch-Keeping Roster

A watch-keeping roster for the ATS shall be prepared by the SATCO or the Senior Supervisor for AIS, by the AIS Supervisor.

The roster should be published not later than the 28th day of each month and shall show the shifts of watch-keeping and hours of duty required of individual Controllers/AIS Officers through out the following month.

b. Taking Over Watch

Prior to taking over watch, Controllers/AIS Officers shall: Ensure that they are fully conversant with the latest published orders, instructions and notices, with particular reference where appropriate to the serviceability of the aerodrome and its facilities.

Note should be taken of details regarding any presidential, VIP or other special flights expected during the period of watch.

c. Handing Over Watch

Controllers/AIS Officers handing over watch shall ensure that they provide their successors with the fullest possible information regarding the current traffic situation/situation, including any items of specific interest or urgency, which have influenced the development of the situation and which may have a bearing on the progress of ensuring watch. Where pictorial delays displays are in operation, they shall give a true presentation of the traffic situation.

Should any situation develop during the watch such as action in the event of distress, emergency, or accident whereby the interest of safety or efficiency, it is considered beneficial for the Controller/AIS Officer to complete such actions and subsequent reports and records rather than to transfer the responsibility for completion to another Controller/AIS/Officer, notwithstanding the fact that the watch roster defines the appointed time as this responsibility has been discharged.

When the Controller/AIS/Officer taking over is fully conversant with the air traffic situation and is prepared to assume full responsibility for the watch, the Controller/AIS/Officer handing over shall sign the Air Traffic Control/AIS Watch Log as having handed over watch.

d. Handing over an operational position/watch

The responsibility for the accuracy of the hand over lies with the person vacating an operational position/watch. This does not remove all responsibility from the Controller/AIS/Officer taking over who must be aware that the Controller/AIS/Officer being relieved may well be fatigued. The

Controller/AIS/Officer taking over should be alert to the possibility of errors and omissions and in the information given to him, must verify the data transferred by a thorough check of the radar display, flight progress strips and any other relevant information. He must also clearly indicate to the Controller/AIS/Officer handing over when he is ready to accept responsibility for the operational position/watch.

1.2 Visitor(s)

Absolutely no unauthorized visitor(s) shall be allowed to have access to the ATS Operation Room. Only the Management or SATCO shall have the authority to arrange visitation into the ATS operation room by the following:

- a. Student tour group(s);
- b. Guests for fact finding;
- c. Any other group(s) as may be deemed necessary.

Before bringing visitors into the ATS operating room, a check shall be made with the Senior Air Traffic Control Officer (SATCO) as to whether the traffic situation makes it convenient to do so.

At no time shall visitor(s) be allowed to interfere with the smooth running of the watch

1.3 Clocks

The clocks in the Control Tower shall indicate UTC.

1.4 Publications

The minimum scale of fully amended publications held at each Air Traffic Services Unit and available for Controllers to consult is shown below:

- Manual Of Standards-Air Traffic Management;
- Local Air Traffic Control Instructions;
- Roberts FIR AIP With Supplements and NOTAM;
- Air Navigation Order;
- Rules Of The Air Regulations;
- Air Navigations(General) Regulations;
- Aeronautical Information Circulars;
- ICAO Documents 4444 PAN RAC;
- 7910 Location Indicators;
- 8226 Aeronautical Information Services;
- 8400 Abbreviations And Codes;
- 8585 Abbreviations Of Aeronautical Authorities

- 8643 Aircraft Types Designators;
- 9426

1.5 ATC Watch Log Maintenance

A detailed Air Traffic Control Watch Log shall be maintained by each Air Traffic Service Unit and shall be labeled and treated as a restricted document. Detailed instructions on the use of the log appear on the inside of the flight cover.

1.6 Inspection

Controllers in charge shall inspect the Air Traffic Control Watch log daily and take note of significant entries and sign it.

The watch log will be inspected during annual inspections by the SATCO or his appointee.

1.7 Impounding Of Log Books

The Senior Air Traffic Control Officer (SATCO) shall have full authority to impound any Air Traffic Control Log Book if he considers that its content may throw any light on a particular accident. When such action is taken, the log book shall be withdrawn as soon as possible after the request is made and handed over to Management. In these circumstances, a replacement logbook shall be opened.

1.8 Disposal of Records

Air Traffic Services records and logbooks may be disposed of as shown below provided they are not required for the investigation of accidents, incidents or official complaints:

1.8.1 ATC Logbook

Retained at the ATC (SATCO's) office for one year after the date of closing and then destroyed locally.

1.8.2 Flight Progress Strips

Retained for a minimum period of thirty (30) days and then destroyed locally.

1.8.3 Other Records (Meteorological Messages, Flight Plans) Etc

Retained for two months and destroyed locally.

1.8.4 Aircraft Movement Log

LCAA/RIA Management units: as agreed by the Registry and Achieve Services.

CHAPTER 2. AIR TRAFFIC CONTROL, LICENSING

2.1 Air Traffic Controller License

The Civil Aviation Authority regulates aviation within the Republic of Liberia.

Authority for granting Air Traffic Controllers licenses and ratings is the sole responsibility of the Director General of Civil Aviation and designated personnel appointed by him.

The Director General of Civil Aviation is also responsible for the revocation, suspension or variation of all ATC licenses.

The Director General of Civil Aviation authorizes the granting of licenses to persons who demonstrate their knowledge, experience, competence, skills, physical and mental fitness to the satisfaction of the authority

Details of evidence which must be furnished, the examination must be passed and other requirements which must be met before ratings, licenses or certificates of competence will be issued are in the possession of the Directorate of Civil Aviation

2.2 Minimum Experience Requirement (MER)

The minimum experience required for the certification of licensing and rating of a controller shall be within three to six months-under the supervision of a qualified Air Traffic Controller.

A recommendation for a rating will not be accepted unless the SATCO is: Fully satisfied that the applicant(s) has met the minimum requirement as stated above

DISPENSATION

Dispensation will not be granted from the minimum experience requirement for the first certificate of competence of a particular rating

Dispensation from the minimum experience requirement in other cases is only granted in exceptional circumstances. Generally, this is confined to applicant(s) who have the previous relevant experience

A person who is providing an air traffic services under supervision for the purposes of obtaining experience requirement, training or an examination must hold either:

- i. A valid ATC license (not necessarily related to the service being provided); or
- ii. A valid student ATC license

A supervising controller is responsible for the safe operation of air traffic and must satisfy himself that he can fulfill that responsibility

It is important that the supervising controller is fully aware of the responsibility during an examination if the examiner does not hold a valid ATC license for the airport.

2.3 Maintenance of Licenses

The maintenance of an ATC's license is the responsibility of the SATCO who should pay particular attention to:

- i. MEDICAL FITNESS -The license holder must include a current ICAO class 3 medical certificate for all ATC licenses in general;
- ii. THE COMPETENCE TO PROVIDE ATS AT RIA - If the SATCO has not renewed the ATC license beyond the period for which it was granted for RIA, the license becomes invalid or expired

If the license holder is in any doubt about his/her competence to provide air traffic control service, he/she must notify the SATCO/ATS Manager. If a controller knows that he/she is not fit for any reason, medical or otherwise, to provide air traffic service, he/she must refrain from doing so.

2.4 Competence Fitness

Holder of the air traffic control license for RIA will be required to renew their licenses annually. Persons authorized to sign an air traffic controller competence license are from the licensing office of the CAA. The licensing officer who is unable to certify a controller as competent must report the facts to the Director General of the CAA who will in turn inform the RIA management

When the Air Traffic Control Manager (SATCO) has reasonable ground to doubt the competence or fitness of a license holder, he shall:

- i. Instruct the license holder that for the time being he/she is not to exercise the privilege(s) of his rating.
- ii. Inform the licensing officer at the CAA through RIA Management who will make full investigation of the circumstances and determine further action.

2.5 Air Traffic Control Incident Assessment

Any air traffic control related incident/accident involving safety, where a controller's action, inadequate air traffic control procedures or faulty equipment may have been a contributing factor shall be assessed as quickly as possible

The assessment procedure, following the reporting action at an aerodrome or the Air Traffic Control Unit falls into two phases:

- Phase 1 - Initial action at the unit
- Phase 2 - Full investigation by RIA/CAA

Phase 1 - Initial Action

The SATCO or his deputy is to take the following action without delay:

- i. Wherever practicable the controller is to be withdrawn from the operational duty and informally interviewed to establish the basis facts.
- ii. If it is likely that the controllers, air traffic control procedures or equipment are implicated, inform or telephone the RIA management/CAA giving immediately available details of the incident.

The Director General (DG) or his deputy will decide whether or not to provisionally vary the controller's license and the extent, if any, of immediate remedial action (e.g., competence check, period of training etc) and advise the SATCO accordingly. If considered necessary he will request for Management assessment.

This is expected to be whenever controller competence is in doubt, ATC procedures are suspected of being unsafe, or the equipment might be at fault.

The management is to:

- i. Enable immediate action to be taken in order to prevent a recurrence, e.g., cease using a particular procedure, withdraw suspected faulty equipment etc.
- ii. Include evidence, which will form the basis of an in-depth investigation of the incident. It shall be forwarded to the CAA within seven (7) days.

The SATCO should call upon competent investigators where available, to assist initial investigation and assessment of controller's involvement. The Director General will, when possible, make staff available.

Phase 2 - Full Investigation

A full investigation will be conducted by the ATS investigator from the CAA if the circumstances warrant it, i.e. if air traffic control is implicated in the case of a serious incident or has been safety deficient. This usually involves interviews at the units concerned and may require further evidence from the controllers who have already been informally interviewed. Other relevant evidence available will be taken into account, e.g. pilot's reports or RTF transcripts.

In ATS investigations of cases, if at any stage it is realized that neither air traffic controllers, equipment nor ATC procedures were implicated in causing the incident, ATS investigators will hand over all relevant documents to the appropriate department.

a) Remedial Action

All subsequent reports from ATS investigation shall be submitted to the Director General (DG) of the CAA through the RIA Management. The Director General confirms the degree of responsibility air traffic controllers and associated remedial action although, ideally, the decision on remedial action for a controller will be

made during the original contact with the Director General of the CAA. He will also (Initial Action – Phase 1) oversee changes to air traffic control procedures nationally or at the unit

b) Mandatory Occurrence Report

A safety related incident, which does not fall into the above categories, is to be filed as a mandatory occurrence report and submitted to the SATCO for initial evaluation and processing. It should be noted that if during the local assessment the competence of a controller is in doubt, the SATCO should withdraw the individual from operational duty and inform the airport management.

2.6 Regulation of Controllers Hours

Controllers as well as the SATCO, have a responsibility to ensure that they conform to schedule to regulate air traffic controllers' hours. It is particularly important that controllers who provide air traffic control services keep sufficient account of their periods of duty so that they will be in a position to establish that they have not breached the regulations.

2.7 Medical Examination

The SATCO shall arrange a medical examination through the RIA Management to the CAA for an authorized medical examiner to conduct an annual medical exam at any time during the month of expiry of the medical certificate. A list of authorized medical examiners can be obtained from the CAA.

Prior to the physical examination, an applicant shall complete and sign a special medical questionnaire form before under going the exam.

License holder(s) who fail to pass the medical examination will be informed immediately by the medical examiner who may:

- Remove and retain the medical certificate; and/or
- Notify the CAA

In either event, the license holder must not exercise the privileges of the license until he/she is again deemed fit and holds a current medical certificate.

2.8 Incapacity

Personal Injury and Illness

The license holder who suffers any personal injury or illness involving incapacity to undertake the functions to which the license relates through out a period of 20 (twenty) consecutive days shall inform the SATCO as soon as possible who in turn will inform the CAA through management. Upon the elapse of this period the license is automatically deemed to be suspended. When the license holder believes he/she is fit to resume functions, he/she should obtain a report from a medical and forward it to the SATCO who will then inform the CAA through

Management. The CAA will advise what further examination, if any, the license holder must undergo before being pronounced fit to resume his function under the license.

The advice of the CAA should be sought if there is reason to believe, at any time, that a license holder who has a current medical certificate may have fallen below the required medical standards.

2.9 *Pregnancy*

If it is confirmed that a licensed holder is pregnant, she is to obtain a report from a medical doctor and forward same to the Personnel Department for further submission to the CAA who will specify the period and conditions under which the license holder may continue to provide an ATC service.

2.10 *Limitation on License*

A medical certificate may include certain limitations. A typical limitation is subject to another similarly qualified controller being in close proximity. The interpretation of this statement is that the qualified controller should be physically present in the same room, if not actually by the side of the controller concerned, and should be able to take over control responsibility without delay.

SECTION IX.
EXTRANEOUS DUTIES

CHAPTER 1. AERODROME INSPECTION

1.1 *Introduction*

The air traffic control unit is responsible for the aerodrome inspections. However, special arrangements may be made for these duties to be delegated to the aeronautical information service (AIS).

Aerodrome service and lighting inspections are carried out to ensure that:

- a. The air traffic control unit becomes aware of any unserviceabilities or obstructions that may affect the use of the aerodrome and are able to supply pilot with accurate essential aerodrome information.
- b. Unserviceabilities or obstructions that are observed may receive attention.

1.2 *Aerodrome Service Inspections*

At least one regular inspection should be made daily. At aerodrome which is opened 24 hour this should be as soon as practicable before the first arrival or departure. At noon-24 hour station the inspection should take place before flying commences. A further inspection should be conducted before night flying.

Additional surface inspection should be made:

- a. At cessation of work on the maneuvering area;
- b. Following an aircraft accident;
- c. Following an abandoned take-off by a turbine engine aircraft due to engine malfunction or by any aircraft due to burst tires;
- d. Following a heavy shower as frequently as whether condition warrant;
- e. When considered necessary by the air traffic control unit.

Aerodrome inspections should cover the runway-in-use, together with the associated prepared stripes, clearways, stop ways and appropriate taxi ways.

The person carrying out the inspection is not normally required proceed outside the aerodrome boundary. He should carry out his inspection from a vehicle driven slowly over the area to be inspected, halting as necessary when individual items require closer inspection. He should report his findings.

In the following paragraphs "temporary obstruction" means anything which will impede the normal movement of aircraft or infringe current aerodrome obstruction criteria.

Normal conditions

A check should be made to ascertain whether or not:

- a. The runways, stop ways, clear ways, taxi ways, and holding areas are free from obstructions, collection of loose stones, over grown grass, standing water, etc:
- b. Temporary obstruction that exist on, or adjacent to, the run ways or taxi ways are properly marked or lighted;
- c. Broken surface or depression on the run ways and taxi ways
- d. Obliteration of runways and taxiways markings,
- e. Runways indicator boards, traffic sounds, boundaries markers, etc are serviceable and in position.

A note should be taken of the exact position of the obstruction or unserviceability observed. Any of the above conditions that are encountered should be reported to the section/department concerned

1.3 *Aerodrome Lighting Inspections*

The aerodrome lighting should be inspected before night flying commences. The inspection should include only those lights which can easily be seen from the aerodrome, should cover the following:

- a. The serviceability of runway, taxiway and obstruction lighting, traffic lights, beacons and the approach lighting
- b. A check that lightens is not obscured by long grass or other obstructions
- c. Precision Approach Path Indicators (PAPI) are accurately setup and serviceable

1.4 *Reporting Action*

Unserviceabilities or obstructions during aerodrome surface or lighting inspections should be recorded on the appropriate aerodrome inspection form, log and the information disseminated as follows:

- a. Deputy Managing Director-(Technical/Operations)
- b. Airport Services Manager
- c. Base Support Department

When urgent action is necessary, i.e., for marking, lighting or immediate repair, details should be passed to the responsible section.