

SEVENTH SCHEDULE (Regulations 36, 37, 38, 67)

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SUBPART A: GENERAL

7.001 APPLICABILITY

This Schedule outlines the instruments and equipment requirements that pertain to all domestic and international flight operations of Jamaica-registered aircraft and all aircraft operated in commercial air transport by the holder of an Air Operator Certificate issued by Jamaica.

7.010 ACRONYMS

The following acronyms are used in this Schedule -

- AOC - Air Operator Certificate;
- CVR – Cockpit Voice Recorder;
- DME – Distance Measuring Equipment;
- ELT – Emergency Locator Transmitter;
- FDR – Flight Data Recorder
- ILS – Instrument Landing System;
- IFR – Instrument Flight Rules;
- IMC - Instrument Meteorological Conditions;
- MEL – Minimum Equipment List;
- MNPS - Minimal Navigation Performance Specifications;
- PBE - Protective Breathing Equipment;
- RNP – Required Navigation Performance;

RVSM – Reduced Vertical Separation Minimum;
SSR – Secondary Surveillance Radar;
VFR – Visual Flight Rules;
VMC - Visual Meteorological Conditions; and
VOR – VHF Omnidirectional Range.

7.015 GENERAL INSTRUMENT AND EQUIPMENT REQUIREMENTS

- (a) All aircraft shall be equipped with instruments which will enable the flight crew to -
 - (1) control the flight path of the aircraft;
 - (2) carry out any required manoeuvres; and
 - (3) observe the operating limitations of the aircraft in the expected operating conditions.
- (b) In addition to the minimum equipment necessary for the issuance of a Certificate of Airworthiness, the instruments and equipment prescribed in this Schedule shall be installed or carried, as appropriate, in aircraft according to the nature of the aircraft's operation and to the circumstances under which the flight is to be conducted.
- (c) All required instruments and equipment shall be approved and installed in accordance with applicable airworthiness requirements.
- (d) Prior to operation in Jamaica of any aircraft not registered in Jamaica that uses an airworthiness inspection program approved or accepted by the State of Registry, the owner/operator shall ensure that instruments and equipment required by Jamaica but not installed in the aircraft are properly installed and inspected in accordance with the requirements of the State of Registry.
- (e) No flight shall be allowed to commence unless the required equipment -
 - (1) meets the minimum performance standard and the operational and airworthiness requirements of all relevant standards, including Annex 10, Volume I of the International Civil Aviation Organization;
 - (2) is installed such that the failure of any single unit required for either communication or navigation purposes, or both, will not result in the inability to communicate and/or navigate safely on the route being flown; and
 - (3) is in operable condition for the kind of operation being conducted, except as provided in the MEL.
- (f) Where equipment is to be used by one flight crewmember at his station during flight, it shall be installed so as to be readily operable from his or her station.
- (g) When a single item of equipment is required to be operated by more than one flight crewmember, it shall be installed so that the equipment is readily operable from any station at which the equipment is required to be operated.
- (h) The aircraft shall be equipped with spare fuses and bulbs of appropriate ratings for the replacement of those accessible in flight.
- (i) An airborne collision avoidance system shall operate in accordance with the relevant provisions of ICAO Annex 10, Volume IV.
- (j) In addition to the requirements of this Schedule, the Authority may prescribe such additional instruments or equipment as necessary for the safety of particular flight operations.

SUBPART B: AIRCRAFT INSTRUMENTS AND EQUIPMENT

7.020 POWER SUPPLY, DISTRIBUTION AND INDICATION SYSTEM

- (a) No person shall operate an aeroplane unless it is equipped with -
 - (1) a power supply and distribution system that meets the airworthiness requirements for certification of an aeroplane in the applicable category as specified by the Authority; or
 - (2) for large and turbine powered aircraft, a power supply and distribution system that is able to produce and distribute the load for the required instruments and equipment, with use of an

external power supply if any one power source or component of the power distribution system fails.

(Note: The use of common elements in the power system may be approved if the Authority finds that they are designed to be reasonably protected against malfunctioning.

- (3) a means for indicating the adequacy of the power being supplied to required flight instruments.
- (b) For large and turbine powered aircraft, engine-driven sources of energy when used, shall be on separate engines.
- (c) All aeroplanes of a maximum certificated take-off mass of over 5,700 kg (12,500 lbs) newly introduced into service after January 1, 1975 shall be fitted with an emergency power supply, independent of the main electrical generating system, for the purpose of operating and illuminating, for a minimum period of 30 minutes, an attitude indicating instrument (artificial horizon), clearly visible to the PIC. The emergency power supply shall be automatically operative after the total failure of the main electrical generating system and clear indication shall be given on the instrument panel that the attitude indicator(s) is/are being operated by emergency power.

7.025 ENGINE INSTRUMENTS - ALL FLIGHTS

- (a) No person shall operate an aircraft in flight unless it is equipped with -
 - (1) a tachometer for each engine;
 - (2) an oil pressure gauge for each engine using pressure system;
 - (3) a temperature gauge for each liquid-cooled system;
 - (4) an oil temperature gauge for each air-cooled system;
 - (5) a manifold pressure gauge for each altitude engine; and
 - (6) a means for indicating the fuel quantity in each tank to be used.
- (b) For commercial air transport, no person shall operate a reciprocating engine aircraft with a maximum gross weight of more than 5,700 kg (12,500 lbs) max takeoff mass unless it also is equipped with -
 - (1) a device for each reversible propeller, to indicate to the pilot when the propeller is in reverse pitch -
 - (i) the device may be actuated at any point in the reversing cycle between the normal low pitch stop position and full reverse pitch, but it may not give an indication at or above the normal low pitch stop position; and
 - (ii) the source of indication shall be actuated by the propeller blade angle or be directly responsive to it;
 - (2) a carburettor air temperature indicator for each engine;
 - (3) a cylinder head temperature indicator for each air-cooled engine;
 - (4) a fuel pressure indicator for each engine;
 - (5) a fuel flow meter;
 - (6) an oil quantity indicator for each oil-tank when a transfer or separate oil reserve supply is used;
 - (7) an oil temperature indicator for each engine; and
 - (8) an independent fuel pressure warning device for each engine or a master warning device for all engines with a means for isolating the individual warning circuits from the master warning device.
- (c) The Authority may allow or require different instrumentation for turbine engine powered aircraft to provide an equivalent level of safety.

7.030 FLIGHT INSTRUMENTS - ALL FLIGHTS

- (a) No person shall operate an aircraft in flight unless it is equipped with -
 - (1) a magnetic compass;
 - (2) an accurate clock indicating the time in hours, minutes and seconds;

- (3) a sensitive pressure altimeter calibrated in feet with sub-scale settings, calibrated in hectopascals or millibars, adjustable for any barometric pressure likely to be set in flight; and
 - (4) an airspeed indicator calibrated in knots.
- (b) No person shall operate an aeroplane with speed limitations expressed in terms of Mach number unless there is a properly installed Mach number indicator.
 - (c) Those flight instruments that are used by any one pilot shall be so arranged as to permit that pilot to see the indications readily from their station with the minimum practical deviation from the position and line of vision normally assumed when looking forward along the flight path.
 - (d) When a means is provided for transferring an instrument from its primary operating system to an alternative system, the means shall include a positive positioning control and shall be marked to indicate clearly which system is being used.

7.035 FLIGHT INSTRUMENTS – CONTROLLED OR NIGHT FLIGHT

No person shall operate an aircraft in controlled flight or night flight unless it is equipped with the instruments required by Subsection 7.030 and -

- (1) a gyroscopic rate-of-turn indicator;
- (2) a slip-skid indicator;
- (3) an attitude indicator (artificial horizon); and
- (4) a heading indicator (directional gyroscope).

(Note: These requirements may be met by combinations of instruments or integrated flight director systems provided that the safeguards against total failure in three separate instruments are retained.)

7.040 FLIGHT INSTRUMENTS AND SYSTEM REQUIREMENTS FOR IFR

No person shall operate an aircraft in IFR unless it is equipped with the instruments required by Subsections 7.030 and 7.035 and -

- (1) an airspeed indicating system with a heated pilot tube or equivalent means of preventing malfunctions due to either condensation or icing;
- (2) a vertical speed indicator;
- (3) for commercial air transport, a minimum of two sensitive pressure altimeters with counter drum-pointer or equivalent presentation, except that domestic-only, commercial air transport single pilot operations in propeller driven aircraft of less than 5,700 kg (12,500 lbs) maximum takeoff mass shall be equipped with at least one sensitive pressure altimeter;

(Note: Neither 3-pointer nor drum-pointer altimeters satisfy this requirement.)
- (4) for commercial air transport, two independent static pressure systems except propeller driven aircraft of less than 5,700kg max takeoff mass in which case only one static pressure system which includes an alternate static source is required;
- (5) a means of indicating whether the power supply to the gyroscopic instruments is adequate;
- (6) a means of indicating in the flight crew compartment the outside air temperature; and
- (7) an adequate source of electrical energy for all installed electrical and radio equipment that, for commercial air transport shall include -
 - (i) for multi-engine aircraft, at least two generators or alternators each of which is on a separate engine, of which any combination of one-half of the total number are rated sufficiently to supply the electrical loads of all required instruments and equipment necessary for safe emergency operation of the aircraft except that for multi-engine helicopters, the two required generators may be mounted on the main rotor drive train; and
 - (ii) two independent sources of energy (with means of selecting either) of which at least one is an engine-driven pump or generator, each of which is able to drive all required gyroscopic instruments powered by, or to be powered by, that particular source and installed so that failure of one instrument or source, does not interfere with the energy supply to the remaining instruments or the other energy source unless, for single-engine

aircraft in cargo operations only, the rate of turn indicator has a source of energy separate from the bank and pitch and direction indicators.

(Note: For the purpose of this paragraph, for multi-engine aircraft, each engine-driven source of energy must be on a different engine.)

(Note: For the purpose of this paragraph, a continuous inflight electrical load includes one that draws current continuously during flight, such as radio equipment, electrically driven instruments, and lights, but does not include occasional intermittent loads.)

7.043 REQUIREMENTS FOR SINGLE PILOT IFR OR NIGHT OPERATIONS

Aircraft approved to be flown by a single-pilot in IFR or night flight shall be equipped with:

- (1) a serviceable autopilot that has at least altitude hold and heading select modes;
- (2) a headset with boom microphone or equivalent; and
- (3) a means of displaying charts that enables them to be readable in all ambient light conditions.

7.045 INSTRUMENTS FOR OPERATIONS REQUIRING TWO PILOTS

- (a) No person shall operate an aircraft in operations requiring two pilots unless each pilot's station has the following flight instruments –
 - (1) an airspeed indicator;
 - (2) a sensitive press altimeter;
 - (3) a vertical speed indicator;
 - (4) a turn and slip indicator (or turn coordinator);
 - (5) an attitude indicator; and
 - (6) a stabilized direction indicator.
- (b) The SIC's flight instruments shall meet the same requirements for markings, indications and illumination as those required for the PIC.

7.050 STANDBY ATTITUDE INDICATOR - COMMERCIAL AIR TRANSPORT

- (a) No person shall operate the following aircraft in commercial air transport unless they are equipped with a standby attitude indicator -
 - (1) an aircraft having a maximum certificated takeoff mass of more than 5,700 kg; or
 - (2) an aircraft having a maximum approved passenger configuration of more than 9 passengers.
- (b) This standby attitude indicator shall -
 - (1) operate independently of any other attitude indicating system;
 - (2) be powered continuously during normal operation;
 - (3) after a total failure of the normal electrical generating system, be powered for a minimum of 30 minutes from a source independent of the normal electrical system; and
 - (4) have an indication clearly evident to the flight crew when the emergency power source is being used.
- (c) Where this standby attitude indicator is usable through flight attitudes of 360 degrees of pitch and roll, it may be used as basis for not having a rate-of-turn gyroscopic instrument.
- (d) Where the standby attitude indicator has its own dedicated power supply there shall be an associated indication, either on the instrument or on the instrument panel when this supply is in use.

7.055 AUTOPILOT

- (a) No person shall operate an aircraft above FL 290 unless that aircraft is equipped with an autopilot capable of automatically maintaining a selected flight level.
- (b) No person shall operate an aircraft in airspace for which MNPS are prescribed unless that aircraft is equipped with an autopilot capable of receiving and automatically tracking the selected

navigational equipment inputs.

- (c) For commercial air transport, no person shall operate an aeroplane with a single pilot under IFR unless that aeroplane is equipped with an autopilot with at least altitude hold and heading mode.

7.060 IFR HELICOPTER STABILIZATION SYSTEM FOR COMMERCIAL AIR TRANSPORT

No person shall operate a helicopter in IFR commercial air transport operations without a stabilization system, unless that helicopter was certificated by the State of Manufacture as having adequate stability without such a system.

7.065 EQUIPMENT FOR NIGHT FLIGHTS

No person shall operate an aircraft at night unless it is also equipped with properly installed -

- (1) aircraft navigation lights;
- (2) an anti-collision beacon;
- (3) a landing light (for helicopter operations, one landing light shall be trainable in the vertical plane);
- (4) illumination for all instruments and equipment that are essential for the safe operation of the aircraft by the flight crew;
- (5) a flashlight at each crewmember station; and
- (6) for international commercial air transport operations -
 - (i) lights in all passenger compartments; and
 - (ii) two landing lights.

(Note: Aeroplanes which are equipped with a single landing light having two separately energized filaments will be in compliance with the two landing light requirement.)

7.067 EQUIPMENT FOR SPECIAL ALTIMETRY ACCURACY (RVSM)

No person shall operate an aircraft in RVSM airspace unless the aircraft is equipped with -

- (1) two independent altitude reporting systems;
- (2) an altitude alerting system;
- (3) an automatic altitude holding system; and
- (4) a transponder with altitude reporting capability which can be connected to the altitude holding system.

7.070 WINDSHIELD WIPERS

No person shall operate an aircraft with a maximum certificated takeoff mass of more than 5,700 kg (12,500 lbs) unless it is equipped at each pilot station with a windshield wiper or equivalent means to clear a portion of the windshield during precipitation.

7.075 FLIGHT IN ICING CONDITIONS

- (a) No person shall operate an aircraft in icing conditions unless it is equipped with suitable anti-icing or de-icing devices adequate for flight in the conditions that are reported to exist or are expected to be encountered.
- (b) The anti-icing or de-icing equipment shall provide for prevention or removal of ice on windshield, wings, empennage, propellers and other parts of the aeroplane where ice formation will adversely affect the safety of the aircraft.
- (c) No person shall operate an aeroplane in expected or actual icing conditions at night unless it is equipped with a means to illuminate or detect the formation of ice. This illumination must be of a type that will not cause glare or reflections that would handicap crewmembers in the performance of their duties.

7.080 WEATHER RADAR - COMMERCIAL AIR TRANSPORT

- (a) Except as provided in the Tenth Schedule, Subsection 10.718 or unless operating in VMC, no

person shall operate an aeroplane having a maximum approved passenger seating of more than nine seats in commercial air transport unless it has an approved weather radar or thunderstorm detection device installed.

- (b) Unless operating in VMC, no person shall operate an aeroplane having a maximum certificated takeoff mass of more than 5,700 kg (12,500 lbs) in commercial air transport unless it has an approved weather radar installed.
- (c) No person shall begin a commercial air transport passenger flight under IFR or night VFR, when current weather reports indicate that thunderstorms, or other potentially hazardous conditions that could be detected by the installed weather radar or thunderstorm detection device may reasonably be expected along the route, unless that equipment is operating satisfactorily.
- (d) If the weather radar or thunderstorm detection device becomes inoperative on a commercial air transport passenger aircraft en route, the aircraft must be operated under the instructions and procedures specified in the AOC holder's Operations Manual.
- (e) An alternate electrical power supply is not required for the weather radar or thunderstorm detection device.

7.085 SPECIAL SEAPLANE EQUIPMENT

No person shall operate a seaplane unless it is equipped with -

- (1) an anchor;
- (2) a sea anchor (drogue), to assist in manoeuvring;
- (3) two paddles to assist in manoeuvring the aircraft on the water without the aid of the engine;
- (4) a hand operated pump to withdraw water from the inside of the floats;
- (5) an air horn for making the sound signals prescribed in the International Regulations for Preventing Collisions at Sea; and
- (6) individual flotation devices as required by 7.273.

(Note: "Seaplanes" includes amphibians operated as seaplanes.)

SUBPART C: COMMUNICATIONS AND NAVIGATION EQUIPMENT

7.095 RADIO COMMUNICATION EQUIPMENT - GENERAL

- (a) No person shall operate an aircraft that is not equipped with radio communications equipment -
 - (1) in controlled flight;
 - (2) under instrument flight rules; or
 - (3) at night.
- (b) The installed radio communications equipment shall be capable of conducting two-way radio communication -
 - (1) with the appropriate air traffic control service;
 - (2) on the assigned frequencies; and
 - (3) on the aeronautical emergency frequency 121.5 Megahertz.
- (c) Aircraft operated under IFR will have two independent methods of receiving communications from air traffic service.
- (d) Where more than one radio communications unit is required for the flight operation, each unit shall be independent of the other or others to the extent that a failure in any one will not result in failure of any other.
- (e) No person shall operate an aircraft in IFR operations requiring two pilots unless it is equipped with an audio selector panel accessible to both pilots.
- (f) Each person operating an aircraft that does not have the required radio communication equipment shall obtain prior permission before operating in airspace requiring such equipment.

7.100 RADIO COMMUNICATION EQUIPMENT - COMMERCIAL AIR TRANSPORT

- (a) Except as provided in paragraph (c) of this Subsection, no person shall operate an aircraft in commercial air transport unless equipped with two independent radio communications equipment installations which, for the route and airspace flown, are capable of conducting two-way radio communication at any time during flight with –
 - (1) at least one aeronautical station; and
 - (2) any other aeronautical stations and frequencies which may be prescribed by the appropriate authority of the area being navigated.
- (b) No person shall operate an aircraft in commercial air transport unless equipped with radio communications equipment capable of receiving meteorological information at any time during the flight.
- (c) An aircraft operated in domestic commercial air transport, VFR-only operations, shall be equipped with at least one radio communications equipment installation, capable of conducting two-way radio communication at any time during flight with the stations identified in paragraphs (a) (1) and (2) of this subsection.

7.105 BOOM MICROPHONE - COMMERCIAL AIR TRANSPORT

- (a) Except as provided in paragraph (c) of this Subsection, no person shall operate an aircraft in commercial air transport unless there is a boom or throat microphone available at each required flight crewmember duty station.
- (b) No person shall operate an aircraft with a single pilot under IFR or at night in commercial air transport unless that aircraft is equipped with a headset with a boom microphone or equivalent and a transmit button on the control wheel.
- (c) Until March 1, 2006, an aircraft operated in domestic commercial air transport, VFR-only operations may be equipped with a communications handset in lieu of a boom microphone.

7.110 ALTITUDE REPORTING TRANSPONDER

- (a) No person shall operate an aircraft in airspace that requires a pressure altitude reporting transponder unless that equipment is operative.
- (b) No person shall operate an aircraft at altitudes above FL 290 unless it is equipped with a system that automatically reports pressure altitudes.
- (c) For commercial air transport, no person shall operate an aircraft in commercial air transport unless it is equipped with a pressure-altitude reporting transponder that operates in accordance with the requirements of the appropriate air traffic service requirements.

7.115 NAVIGATION EQUIPMENT - GENERAL

- (a) No person shall operate an aircraft unless it is equipped with navigation equipment that will enable it to proceed in accordance with -
 - (1) the flight plan;
 - (2) prescribed RNP (required navigational performance) types; and
 - (3) the requirements of air traffic services.

(Note: Navigation under VFR may be accomplished without navigation equipment, by visual reference to landmarks, if not precluded by the appropriate authority for the route and airspace.)

- (b) No person shall operate an aircraft unless that aircraft is equipped with sufficient navigation equipment to ensure that, in the event of failure of one item of equipment at any stage of the flight, the remaining equipment will enable the aircraft to continue navigating in accordance with the requirements of this Schedule.
- (c) Every radio navigation system shall have an independent antenna installation, except that, where rigidly supported non-wire antenna installations of equivalent reliability are used, only one

antenna is required.

- (d) No person shall operate navigation equipment predicated on a database management system unless approved by the Authority. The procedures required to be followed to ensure the timely distribution and insertion of current and unaltered electronic navigation data to all aircraft that require it shall be published in the operator's Operations Manual and/or Maintenance Control Manual. The operator shall establish, as part of its quality assurance programme, a method of ensuring both process and products for its navigation equipment.
- (e) No person shall use navigation equipment predicated on electronic navigation data unless that data is current and appropriate for the routes flown and aerodromes used.

7.120 SPECIAL NAVIGATION ACCURACY (RNP AND MNPS)

- (a) For flights in defined portions of airspace where MNPS or RNP are prescribed, the navigational equipment shall continuously provide indications to the flight crew of the adherence to or departure from track to the required degree of accuracy at any point along that track.
- (b) No person shall operate an aircraft where MNPS are prescribed, unless it is equipped with -
 - (1) for unrestricted operations, two independent long range navigation systems; or
 - (2) for notified special routes, one long range navigation system.
- (c) The navigation equipment required for operations in MNPS airspace shall be visible and usable by either pilot seated at their duty stations.

7.125 NAVIGATION EQUIPMENT - IFR APPROACH

- (a) No person shall operate an aircraft in situations that would require a landing approach to an airport in IMC unless that aircraft is equipped with the appropriate radio equipment required to accomplish the published instrument approach for the planned destination and alternate airports.
- (b) The navigation equipment installed on the aircraft shall be capable of receiving signals providing guidance to a point from which a visual landing can be made.

SUBPART D: WARNING EQUIPMENT AND INDICATORS

7.130 WARNING SYSTEMS - GENERAL

- (a) No person shall operate a turbojet aircraft unless it is equipped with an installed aural mach overspeed warning.
- (b) Pressurized aeroplanes intended to be operated at flight altitudes at which the atmospheric pressure is less than 376 hPa (25,000 ft) shall be equipped with a device to provide positive warning to the flight crew of any dangerous loss of pressurization.
- (c) No person shall operate an aircraft of more than 5,700 kg (12,500 lbs) certificated takeoff mass in commercial air transport without a means of indicating pitot heater failure.

7.135 LANDING GEAR AURAL WARNING DEVICE

- (a) No person shall operate an aircraft with retractable landing gear unless it is equipped with an aural warning device that functions continuously anytime the landing gear is not fully extended and locked and the wing-flap setting exceeds the position -
 - (1) specified in the AFM for maximum certificated approach climb configuration; or
 - (2) where landing gear extension is normally performed.
- (b) This warning system -
 - (1) shall not have a manual shutoff;
 - (2) must be in addition to any throttle-actuated device; and
 - (3) may utilize any part of the throttle-actuated device.

7.140 ALTITUDE ALERTING SYSTEM

- (a) No person shall operate the following aircraft unless it is equipped with an altitude alerting system-
 - (1) a turbojet powered aeroplane; or
 - (2) a turbine powered aeroplane -
 - (i) having a maximum approved passenger seating of more than nine seats; or
 - (ii) with a certificated takeoff mass of more than 5,700 kg (12,500 lbs).
- (b) The altitude alerting system will be capable of alerting the flight crew -
 - (1) upon approaching a pre-selected altitude in either ascent or descent; and
 - (2) by at least an aural signal, when deviating above or below a pre-selected altitude.
- (c) The threshold for the alert shall not exceed plus or minus 90 m.

7.145 GROUND PROXIMITY WARNING SYSTEM

- (a) No person shall operate turbine powered aircraft unless they are equipped with a ground proximity warning system, if the aircraft has a maximum -
 - (1) approved passenger seating of more than nine seats; or
 - (2) certificated takeoff mass of more than 5,700 kg (12,500 lbs).
- (b) The ground proximity warning system must automatically provide by means of aural signals, which may be supplemented by visual signals, a timely and distinctive warning to the flight crew of -
 - (1) excessive descent rate;
 - (2) excessive terrain closure rate;
 - (3) excessive altitude loss after takeoff or go-around;
 - (4) unsafe terrain clearance while not in landing configuration -
 - (i) gear not locked down; and
 - (ii) flaps not in landing position; and
 - (5) excessive descent below the instrument glide path.
- (c) After April 1, 2005, all turbine-engine powered aeroplanes with a certificated takeoff gross weight of 30,000 kg or a capacity of more than 50 passengers, shall be equipped with a GPWS that has a timely and distinctive predictive terrain hazard warning function.
- (d) After January 1, 2007, all turbine powered aircraft with a certified takeoff gross weight of greater than 5,700 kg (12,500 lbs), or aircraft certified for more than 9 passengers being flown on international flights shall be equipped with GPWS which has a forward looking terrain avoidance function.

7.150 AIRBORNE COLLISION AVOIDANCE SYSTEM (ACAS)

- (a) No person may operate a turbine-engine aeroplane of a maximum certificated take-off mass in excess of 15,000kg (33,070 lbs) or authorized to carry more than 30 passengers that is not equipped with an airborne collision avoidance system (ACAS II).
- (b) After January 1, 2005, no person shall operate a turbine engine aeroplane with a maximum certificated takeoff mass in excess of 5,700 kg (12,500 lbs) or authorized to carry more than 19 passengers, unless it is equipped with an ACAS II.

7.160 RADIATION INDICATOR - COMMERCIAL AIR TRANSPORT

No person shall operate an aeroplane above 15,000 m (49,000 ft) unless that aircraft is equipped with equipment to measure and indicate continuously -

- (1) cumulative dose on each flight.
- (2) the dose rate of total cosmic radiation being received (i.e. the total of ionizing and neutron radiation of galactic and solar origin; and
- (3) the display unit of the radiation equipment shall be readily visible to a flight crewmember.

SUBPART E: RECORDERS

7.165 FLIGHT DATA AND VOICE RECORDERS - GENERAL

- (a) The flight recorders shall be constructed, located and installed so as to provide maximum practical protection for the recorders in order that the recorded information may be preserved, recovered and transcribed.
- (b) The flight recorders shall be checked daily and inspected annually in accordance with ICAO Annex 6, Attachment B (as amended).
- (c) To facilitate location and identification in case of an accident, the cockpit voice recorder shall -
 - (1) be constructed, located and installed so as to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed;
 - (2) be either bright orange or bright yellow;
 - (3) have reflective tape affixed to the external surface to facilitate its location under water; and
 - (4) have an approved underwater locating device on or adjacent to the recorder, which is secured in such a manner that it is not likely to be separated during a crash impact.
- (d) Flight recorders shall meet the prescribed crashworthiness and fire protection specifications.
- (e) Flight recorders shall record in a digital mode.
- (f) An aircraft required to have both CVR and FDR may alternatively be equipped with -
 - (1) a single combination (CVR/FDR) recorder, for aircraft with a maximum certificated takeoff mass of 5,700 kg (12,500 lbs) or less; or
 - (2) two combination (CVR/FDR) recorders, for aircraft with a maximum certificated takeoff mass of more than 5,700 kg (12,500 lbs).

7.170 FLIGHT DECK VOICE RECORDERS

- (a) No person shall operate the following aircraft unless it is equipped with a voice recorder system to record the aural environment of the flight deck during flight time -
 - (1) all aircraft with a maximum certificated takeoff mass of more than 27,000 kg (59,520 lbs);
 - (2) a turbine powered aeroplane operated in commercial air transport -
 - (i) having a maximum approved passenger seating of more than nine seats; or
 - (ii) with a certificated takeoff mass of more than 5,700 kg (12,500 lbs).
 - (3) a helicopter operated in commercial air transport with a certificated takeoff mass of over -
 - (i) 7,000 kg (15,430 lbs); or
 - (ii) for international commercial air transport, 2,700 kg (5,950 lbs).
- (b) A CVR shall be capable of retaining the information recorded during at least the last -
 - (1) 30 minutes; or
 - (2) 2 hours, for aeroplanes of a maximum certificated take-off mass of over 5,700 kg (12,500 lbs) for that receiver type certificated after January 1, 2003.

7.172 RECORDING OF DATA LINK COMMUNICATIONS

- (a) All aeroplanes that utilize data link communications and are required to carry a CVR, shall record on a flight recorder, all data link communications to and from the aeroplane. This requirement is effective -
 - (1) January 1, 2005, for aircraft for which the initial Certificate of Airworthiness is issued after this date; and
 - (2) January 1, 2007, for all applicable aircraft.
- (b) The minimum recording duration shall be equal to the duration of the CVR, and shall be correlated to the recorded cockpit audio.

- (c) The recording shall contain sufficient information to derive the content of the data link communications message and, whenever practical, the time the message was displayed to or generated by the crew shall be recorded.

7.175 FLIGHT DATA RECORDERS

- (a) No person shall operate the following aircraft unless it is equipped with the appropriate FDR system to record the flight parameters for accident and incident analysis unless otherwise prescribed by the Authority -
 - (1) all multi-engine turbojet aeroplanes with a certificated takeoff weight of less than 5,700 kg (12,500 lbs) shall be equipped with a Type IIA FDR;
 - (2) all aeroplanes with a certificated takeoff weight of more than 5,700 kg, up to and including 27,000 kg (59,520 lbs), shall be equipped with a Type II FDR;
 - (3) all turbine-engined aeroplanes of a maximum certificated take-off mass of over 27,000 kg (59,520 lbs) that are of types of which the prototype was certificated by the appropriate national authority after September 30, 1969 shall be equipped with a Type II FDR;
 - (4) all aeroplanes with a maximum certificated takeoff weight of over 27,000 kg (59,520 lbs) shall be equipped with a Type I FDR;
 - (5) all aeroplanes with a gross takeoff weight of more than 5,700 kg (12,500 lbs) that receive original type certification after January 1, 2005 shall be equipped with a Type IA FDR; and
 - (6) all helicopters operated in commercial air transport with a certificated takeoff mass of over 7,000 kg (15,430 lbs) shall have at least a Type IV FDR.
- (b) The Authority has prescribed the minimum parameters that shall be recorded by a FDR.
See Appendix 1 to 7.175 for the parameters that must be monitored by a Type I and Type II FDR.
- (c) FDRs shall be capable of retaining the information recorded during at least the last -
 - (1) Type I and II - 25 hours of operation;
 - (2) Type IIA - 30 minutes of operation; and
 - (3) Type IV and V - 10 hours of operations.
- (d) The FDR mediums not acceptable for use in aircraft registered in Jamaica, or operated by AOC holders of Jamaica are -
 - (1) engraving metal foil;
 - (2) photographic film; or
 - (3) analogue data using frequency modulation.

SUBPART F: CREW PROTECTION EQUIPMENT

7.178 SECURITY OF THE FLIGHT DECK

- (a) No person shall operate an aircraft having a maximum seating capacity of more than 19 passengers unless there is installed a door, lockable from within the flight deck only, to restrict entry to the flight deck.
- (b) No person shall operate an aircraft having a maximum certificated take-off mass in excess of 45,500 kg (100,300 lbs), or having a maximum seating capacity greater than sixty (60) passengers, unless that aircraft is equipped with -
 - (1) an approved flight compartment door that is designed to resist penetration by small arms fire and by grenade shrapnel, and with an installation able to resist forcible intrusion by unauthorized persons. This door shall be capable of being locked and unlocked from either pilot's station.
 - (2) a means of monitoring, from either pilot's station, the entire door area outside the flight crew compartment in order to identify persons requesting entry and to detect suspicious behaviour or potential threat.

7.180 FLIGHT CREW SAFETY HARNESS

- (a) No person shall operate an aircraft unless there is an operational safety harness installed for each required flight crewmember.
- (b) The safety harness shall incorporate a device that will automatically restrain the occupant's torso in the event of a rapid deceleration.

7.181 QUICK DONNING TYPE OXYGEN MASK

No person shall operate a pressurized aircraft at altitudes above 25,000 feet unless there is available at each flight crew duty station a quick donning type of oxygen mask that will readily supply oxygen upon demand.

7.182 CABIN CREW SEATS AND SAFETY HARNESS

- (a) No person shall operate an aircraft for which a cabin attendant(s) is required unless each seat provided is –
 - (1) forward or rearward facing (within 15 degrees of the longitudinal axis of the aircraft);
 - (2) designed to at least meet the inertial load factors established under the original type certification basis of the aeroplane; and
 - (3) fitted with a seat belt and safety harness.
- (b) To facilitate emergency evacuation, each seat shall be located at floor level in the passenger compartment, adjacent to floor level emergency exits or, because of exit type and distribution or the access to the communication system, at some other approved exit.
- (c) Each seat shall provide access to the communication system when the flight attendant is seated unless the original type certification basis of the aeroplane established different communication system and flight attendant seat installation requirements.
- (d) Each seat shall be positioned so that the seat will not interfere with the passageway or exit when the seat is not in use.

7.183 PROTECTIVE BREATHING EQUIPMENT (PBE)

- (a) No person shall operate the following aircraft in commercial air transport, unless it is equipped with a PBE to protect the eyes, nose and mouth of all required crewmembers and provide oxygen or breathing gas for a period not less than 15 minutes -
 - (1) an aircraft with a maximum certified takeoff mass of more than 5,700 kg (12,500 lbs); or
 - (2) an aircraft with a maximum seating capacity of more than 19 seats.
- (b) Protective breathing equipment shall be conveniently located and easily accessible from each required duty station.
- (c) PBE shall be available for use by crewmembers in combatting fires, as follows -
 - (1) one unit for use in each cargo compartment that is accessible to crewmembers in the cabin during flight;
 - (2) one unit for each hand-held fire extinguisher located in each isolated galley;
 - (3) one unit on the flight deck;
 - (4) one unit located within one metre of each hand-held fire extinguisher required in the passenger compartment, except if the Authority has authorized the location of protective breathing equipment more than one metre from each hand-held fire extinguisher where special circumstances exist that make compliance with this subparagraph impractical and that location provides an equivalent level of safety; and
 - (5) the number of units of protective breathing equipment used to satisfy the requirements of this paragraph shall not be less than the minimum number of flight attendants required for the flight.
- (d) The PBE for each cabin attendant shall be portable.

- (e) The PBE, while in use, shall not prevent required communication.
- (f) For cargo aircraft, a PBE shall not be located in the cargo compartment, but immediately prior to entry into that compartment, and near a required fire extinguisher.

SUBPART G: PASSENGER RELATED EQUIPMENT

7.185 PASSENGER SEATS AND SEAT BELTS

No person shall operate an aircraft carrying passengers unless it is equipped with -

- (1) an approved seat or berth for each occupant on board who has reached their second birthday;
- (2) a seat belt for each seat and a restraining belt for each berth; and
- (3) a seat belt referred to in sub-paragraph (2) shall include a latching device of the metal-to-metal type.

7.186 RESTRAINT SYSTEM REQUIREMENTS

No person shall operate an aircraft carrying passengers without being equipped in accordance with Subsection 7.185 by a restraint system that is secured to the primary structure of the aircraft and is provided for each person who is -

- (1) carried on a stretcher or in an incubator or other similar device; or
- (2) carried in a child restraint system that meets the requirements of the Authority.

7.190 PASSENGER INFORMATION

- (a) No person shall operate an aircraft having an approved passenger seating configuration of more than 9 passengers unless it is equipped with at least one passenger information sign notifying when -
 - (1) safety belts should be fastened; and
 - (2) smoking is prohibited.
- (b) These signs shall be so constructed that a crewmember can turn them on and off from a duty station.
- (c) There shall be sufficient signs located in the passenger cabin so that, when illuminated, they will be legible to each passenger under all probable conditions of cabin illumination.

7.195 PUBLIC ADDRESS SYSTEM

- (a) No person shall operate an aircraft with a maximum approved seating configuration of more than 19 passengers unless it is equipped with a public address system.
- (b) This public address system shall be -
 - (1) audible and intelligible at all passenger seats, toilets and cabin crew duty and work stations;
 - (2) capable of operation within 10 seconds by any required crewmember; and
 - (3) accessible by at least one seated crewmember at each separate or pair of floor level emergency exits.

7.200 INTERPHONE SYSTEMS

- (a) No person shall operate an aircraft on which a flight crew of more than one is required unless it is equipped with a flight deck interphone system, including headsets and microphones, which provide audible and intelligible communications between the required crewmembers.
- (b) No person shall operate an aircraft having a maximum approved passenger seating configuration of more than 19 passengers unless it is equipped with a crewmember interphone system which provides for signalling and two-way communications between all required crewmembers.
- (c) This crewmember interphone system required by Subsection 7.200 (b) shall -
 - (1) be capable of operation independently of the public address system;
 - (2) be capable of operation within 10 seconds by any required crewmember, including those at

- remote work stations;
- (3) be accessible by at least one seated crewmember at each separate or pair of floor level emergency exits;
- (4) have a signalling capability which provides for differentiation between normal and emergency calls; and
- (5) provide, on the ground, a means of two-way communication between ground personnel and at least two flight crewmembers.

7.205 MEGAPHONES - COMMERCIAL AIR TRANSPORT

- (a) No person shall operate an aircraft carrying more than 59 passengers in commercial air transport unless it is equipped with the required number of battery-powered megaphones readily accessible to the crewmembers assigned to direct emergency evacuation.
- (b) The required number and location of megaphones are -
 - (1) for an aircraft with a seating capacity of 60 to 99 passengers - one megaphone at the most rearward location readily accessible to a cabin attendant duty station;
 - (2) for an aircraft with more than 99 passengers - an additional megaphone installed at the forward end of the passenger compartment readily accessible to a cabin attendant duty station.

7.210 EMERGENCY EXITS

- (a) No person shall operate an aircraft carrying passengers unless it has adequate emergency exit provisions for emergency evacuations and ditching.
- (b) Each passenger emergency exit (other than over-the-wing) that is more than 6 feet from the ground with the aeroplane on the ground and the landing gear extended, shall have an approved means to assist the occupants in descending to the ground.
- (c) Each passenger emergency exit, its means of access and its means of opening shall be conspicuously marked both inside and outside.
- (d) The location of each passenger emergency exit shall be indicated by a sign visible to occupants approaching along the main passenger aisle.
- (e) Each passenger-carrying aeroplane shall be equipped with a slip-resistant escape route that meets the requirements under which that aeroplane was type-certificated.

(See Appendix 1 to 7.210 for specific requirements regarding these standards.)

7.215 PASSENGER COMPARTMENT AND EXITS

No person shall conduct any passenger-carrying operation unless it has –

- (1) a key for each door that separates a passenger compartment from another compartment that has emergency exit provisions;
 - (Note: The key shall be readily available for each crewmember.)*
- (2) a means for the crew, in an emergency, to unlock each door that leads to a compartment that is normally accessible to passengers and that can be locked by passengers; and
- (3) a placard on each door used to access a required passenger emergency exit, indicating that such door shall be open during takeoff and landing.

7.220 MATERIALS FOR CABIN INTERIORS

- (a) Upon the first major overhaul of an aeroplane cabin or refurbishing of the cabin interior, all materials in each compartment used by the crew or passengers that do not meet the current airworthiness requirements pertaining to materials used in the interior of the cabin for type certification in the transport category as cited by the Authority, shall be replaced with materials that meet the requirements specified by the Authority.
- (b) Seat cushions, except those on flight crewmember seats, in any compartment occupied by crew

or passengers shall meet requirements pertaining to fire protection as specified by the Authority.

7.225 MATERIALS FOR CARGO AND BAGGAGE COMPARTMENTS

Each Class C or D cargo compartment greater than 200 cubic feet in volume in a transport category aeroplane type certified after January 1, 1958 shall have ceiling and sidewall liner panels which are constructed of -

- (1) glass fibre reinforced resin;
- (2) materials which meet the test requirements for flame resistance of cargo compartment liners as prescribed for type certification; or
- (3) In the case of installations approved prior to March 20, 1989, aluminium.

(Note: The term "liner" includes any design feature, such as a joint or fastener, which would affect the capability of the liner to safely contain fire.)

7.230 EMERGENCY LIGHTING SYSTEM

- (a) No person shall operate an aircraft with a maximum approved passenger configuration of more than nineteen passengers unless it is equipped with an emergency lighting system that is independent of the main lighting system.
- (b) The emergency lighting system must -
 - (1) illuminate each passenger exit marking and locating sign;
 - (2) provide enough general lighting in the passenger cabin; and
 - (3) include floor proximity emergency escape path marking.

SUBPART H: EMERGENCY EQUIPMENT

7.235 EMERGENCY EQUIPMENT: ALL AIRCRAFT

Each item of emergency and flotation equipment shall be –

- (1) readily accessible to the crew and with regard to equipment located in the passenger compartment, to passengers without appreciable time for preparatory procedures;
- (2) clearly identified and clearly marked to indicate its method of operation;
- (3) marked as to date of last inspection;
- (4) marked as to contents when carried in a compartment or container; and
- (5) properly secured in its stowage area.

7.240 FIRST AID KIT

- (a) No person shall operate an aircraft unless it is equipped with at least the minimum number of accessible first aid kits and contents specified as follows -

Number of passenger seats installed	Number of first-aid kits required
0 to 99	1
100 to 199	2
200 to 299	3
300 and more	4

- (b) The installed first aid kit shall contain the minimum contents specified by the Authority.

(See Appendix 1 to 7.240 to determine the required contents of the first aid kit.)

7.245 MEDICAL KIT - COMMERCIAL AIR TRANSPORT

- (a) No person shall operate an aircraft authorized to carry more than 250 passengers unless it has a properly installed medical kit for the use of the medical doctors or other qualified persons in treating in-flight medical emergencies.
- (b) The installed medical kit shall contain the minimum contents specified by the Authority.

(See Appendix 1 to 7.245 to determine the required contents of the medical kit.)

7.250 PORTABLE FIRE EXTINGUISHERS

- (a) No person shall operate an aircraft unless it has the minimum number of portable fire extinguishers of a type which, when discharged, will not cause dangerous contamination of the air within the aeroplane. The type and quantity of extinguishing agent shall be suitable for the kinds of fires likely to occur in the compartment where the extinguisher is intended to be used.

(Note: For passenger compartments, the extinguisher shall be designed to minimise the hazard of toxic gas concentrations.)

- (b) The minimum number of portable fire extinguishers and their location shall be -
 - (1) one properly installed in the pilot's compartment;
 - (2) at least one portable fire extinguisher shall be provided and conveniently located for use in each Class E cargo compartment that is accessible to crewmembers during flight, and at least one shall be located in each upper and lower lobe galley; and
 - (3) one properly installed in each passenger compartment that is separate from the pilot's compartment and that is not readily accessible to the flight crew.

(Note: Any portable fire extinguisher so fitted in accordance with the Certificate of Airworthiness of a helicopter may count as one of the required extinguishers.)

- (4) at least one portable fire extinguisher shall be conveniently located in the passenger compartment of aeroplanes having a passenger seating capacity of 30 or less. For each aeroplane having a passenger seating capacity of more than 30, there shall be at least the following number of portable fire extinguishers conveniently located and uniformly distributed throughout the compartment -

Minimum Number of Hand Fire Extinguishers Passenger Seating Capacity	
30 through 60	2
61 through 200	3
201 through 300	4
301 through 400	5
401 through 500	6
501 through 600	7
601 or more	8

- (5) at least two hand-held fire extinguishers shall contain the equivalent to Halon 1211 (bromochlorodifluoromethane).

7.255 LAVATORY FIRE EXTINGUISHER

- (a) No person shall operate a passenger carrying aircraft of more than 5,700 kg (12,500 lbs) maximum certificated takeoff mass unless each lavatory is equipped with a built-in fire extinguisher for the wastepaper disposal.
- (b) This built-in fire extinguisher must be designed to discharge automatically into each disposal receptacle upon the occurrence of a fire in the receptacle.

7.260 LAVATORY SMOKE DETECTOR

No person shall operate a passenger carrying aircraft of more than 5,700 kg (12,500 lbs) maximum certificated takeoff mass unless each lavatory in the aeroplane is equipped with a smoke detector system that provides -

- (1) a warning light in the flight deck; or
- (2) a warning light or audio warning in the passenger cabin, taking into account the position of the cabin attendants during various phases of flight.

7.265 CRASH AXE - COMMERCIAL AIR TRANSPORT

No person shall operate an aircraft with a maximum certificated takeoff mass of more than 5,700 kg (12,500 lbs) unless it is equipped with a crash axe appropriate for effective use in that aircraft and stowed so as not to be accessible to passengers while in flight.

7.268 FLASHLIGHTS

- (a) No person shall operate a passenger carrying aircraft unless the aircraft is equipped with flashlight stowage provisions that are accessible from each required flight attendant seat.
- (b) No person shall operate a passenger carrying aircraft unless each flight attendant required to be on board the aircraft has a flashlight readily available for use.

7.270 OXYGEN STORAGE AND DISPENSING APPARATUS

- (a) All aircraft intended to be operated at altitudes requiring the use of supplemental oxygen shall be equipped with adequate oxygen storage and dispensing apparatus.
- (b) The oxygen apparatus, the minimum rate of oxygen flow and the supply of oxygen shall meet applicable airworthiness standards for type certification in the transport category as specified by the Authority.
- (c) No AOC holder shall operate an aeroplane at altitudes above 10,000 feet unless it is equipped with oxygen masks, located so as to be within the immediate reach of flight crewmembers while at their assigned duty station.
- (d) No person shall operate a pressurized aeroplane at altitudes above 25,000 feet unless -
 - (1) flight crewmember oxygen masks are of a quick donning type;
 - (2) sufficient spare outlets and masks and/or sufficient portable oxygen units with masks are distributed evenly throughout the cabin to ensure immediate availability of oxygen to each required cabin crewmember regardless of his location at the time of cabin pressurisation failure; and
 - (3) an oxygen-dispensing unit connected to oxygen supply terminals is installed so as to be automatically deployed and immediately available to each occupant, wherever seated. The total number of dispensing units and outlets shall exceed the number of seats by at least 10%. The extra units are to be evenly distributed throughout the cabin.
- (e) The amount of supplemental oxygen for sustenance required for a particular operation shall be determined on the basis of flight altitudes and flight duration, consistent with the operating procedures established for each operation in the Operations Manual and with the routes to be flown, and with the emergency procedures specified in the Operations Manual.
- (f) Supplemental oxygen bottles required by passengers for medical reasons shall be supplied by the air operator and must be properly secured in the cabin for all phases of the ground operation and in flight.

(See Appendix 1 and Appendix 2 to 7.270 to determine the amount of supplemental oxygen needed for non-pressurized and pressurized aircraft.)

7.273 INDIVIDUAL FLOTATION DEVICES

- (a) No person shall operate an aircraft on the following flights unless it is equipped with one life jacket or equivalent individual flotation device for each person on board -

- (1) for multi-engine aircraft capable of maintaining flight in the event of a failure of one engine;
 - (2) while operating over water at a distance of more than 50 nm from a shoreline; or
 - (3) for all other aircraft, while operating beyond gliding distance from a shoreline.
- (b) All life jackets or equivalent individual flotation devices shall be stowed in a position easily accessible from the seat or berth of the person for whose use it is provided.
- (c) For all flights in which a life jacket or equivalent individual flotation device is required, such life jacket or equivalent individual flotation device shall be fitted with an approved survivor locator light and a whistle.

7.275 LIFE RAFTS

- (a) Within the airspace of Jamaica, no person shall operate a single engine or restricted-performance multi-engine aircraft carrying passengers in commercial air transport outside of gliding or autorotation distance from land unless it is equipped with life rafts in sufficient number to accommodate all of the persons on board in the event of ditching.
- (b) No person shall operate an aircraft other than designated in paragraph (a) unless it is equipped with life rafts in sufficient number to accommodate all of the persons on board in the event of ditching when the route of flight will be over water for -
- (1) 120 minutes at cruising speed or 400 nautical miles, whichever is lesser, for multi-engine aircraft capable of continuing the flight to an airport with the critical power unit(s) becoming inoperative at any point along the route or planned diversions;
 - (2) 30 minutes at cruising speed or 100 nautical miles, whichever is lesser, for multi-engine aircraft not capable of continuing the flight to an airport with the critical power unit(s) becoming inoperative at any point along the route or planned diversions; or
 - (3) 15 minutes or the time to descend from cruise altitude to sea level in the event of an engine failure, whichever is greater, for all other aircraft.
- (c) *For commercial air transport passenger-carrying operations in aircraft of more than 5,700 kg (12,500 lbs), the buoyancy and seating capacity of the rafts must accommodate all occupants of the aircraft in the event of a loss of one raft of the largest rated capacity.*
- (d) *For commercial air transport passenger-carrying operations in helicopters, 50% of all required rafts (where the quantity is two or more) will have a means of deployment by remote control.*
- (e) The required life rafts and associated equipment must be easily accessible in the event of ditching without appreciable time for preparatory procedures. This equipment must be installed in conspicuously marked, approved locations.
- (f) Life rafts which are not deployable by remote control and which have a mass of more than 40 kg (88 lbs) shall be equipped with some means of mechanically assisted deployment.

7.280 SURVIVAL KIT

- (a) No person shall operate an aircraft over designated land areas where search and rescue would be especially difficult without carrying life saving equipment including means of sustaining life.
- (b) No person shall operate over water at distances that require the carriage of life rafts unless each raft is equipped with life saving equipment including means of sustaining life.
- (c) The survival kit shall contain the minimum contents specified by the Authority.

7.285 DEVICES FOR EMERGENCY SIGNALLING

- (a) No person shall operate an aircraft over designated land areas where search and rescue would be especially difficult without carrying devices to make the necessary ground-to-air emergency signals to facilitate rescue.
- (b) No person shall operate over water at a distance that requires the carriage of life rafts unless each raft contains the equipment for making the necessary pyrotechnical distress signals.
- (c) The devices for emergency signalling shall be acceptable to the Authority.

7.290 EMERGENCY LOCATOR TRANSMITTER (ELT)

- (a) No person shall operate an aircraft over water at distances that require the carriage of life rafts unless that aircraft is equipped with at least two ELTs, one of which shall be an automatically activated ELT.
- (b) No person shall operate an aircraft over designated land areas where search and rescue would be especially difficult unless it is equipped with at least one automatically activated ELT.
- (c) No person shall operate an aircraft over water at distances that require the carriage of life rafts unless it is equipped with a survival type ELT for the life raft. In situations requiring two or more life rafts, only two survival-type ELTs are required to be carried on the aircraft.
- (d) The expiration date for a replacement or recharged ELT battery shall be legibly marked on the outside of the transmitter. Batteries used in ELTs shall be replaced (or recharged if the battery is rechargeable) when -
 - (1) the transmitter has been in use for more than one cumulative hour; or
 - (2) 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired.

(Note: The battery useful life (or useful life of charge) requirements do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.)

7.295 HELICOPTER EMERGENCY FLOTATION MEANS

No person shall operate a helicopter intentionally over water unless it has a properly installed permanent or rapidly deployable means of flotation to ensure a safe ditching of the helicopter when the flight is -

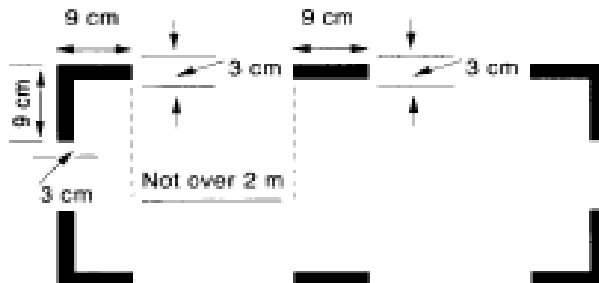
- (1) more than 10 minutes from shore, in the case of helicopters capable of sustained flight with one engine inoperative; or
- (2) beyond autorotational or gliding distance to shore, in the case of single-engine helicopters.

7.300 MARKING OF BREAK-IN POINTS

No person shall operate an aircraft for which areas of the fuselage suitable for break-in for rescue in an emergency are marked unless those markings correspond to the following figure and meet the following requirements -

- (1) the colour of the markings shall be red or yellow, and if necessary, they shall be outlined in white to contrast with the background; and
- (2) if the corner markings are more than 2 m apart, intermediate lines 9 cm x 3 cm shall be inserted so that there is no more than 2 m between adjacent markings.

(Note: This regulation does not require any aircraft to have break-in areas.)



7.305 FIRST AID OXYGEN DISPENSING UNITS

- (a) No AOC holder shall conduct a passenger carrying operation in a pressurized aeroplane unless it is equipped with -
 - (1) undiluted first-aid oxygen for passengers who, for physiological reasons, may require oxygen

- following a cabin depressurization; and
- (2) when a cabin crewmember is carried, a sufficient number of dispensing units, but in no case less than two, with a means for cabin crew to use the supply.
- (b) The amount of first-aid oxygen required in paragraph (a) for a particular operation and route shall be determined on the basis of -
- (1) flight duration after cabin depressurisation at cabin altitudes of more than 8,000 feet;
- (2) an average flow rate of at least 3 litres Standard Temperature Pressure Dry/ minute/person; and
- (3) at least 2% of the passengers carried, but in no case for less than one person.

APPENDICES

APPENDIX 1 TO 7.175: PARAMETERS FOR FLIGHT DECK RECORDERS

The following table summarizes the parameters prescribed by the Authority and shall be recorded in Type I, IA, II, IIA, IV, IVA and V FDR.s -

- (1) the parameters without an asterisk are mandatory parameters that shall be recorded regardless of aircraft complexity.
- (2) those parameters designated by an asterisk (*) are to be recorded if an information source for the parameter is used by the aircraft systems and/or flight crew to operate the aircraft.

TYPE OF FLIGHT DATA RECORDER:	I	IA	II	IIA	IV	V	IVA
Requirements for FLIGHT PATH AND SPEED:							
Pressure altitude	X	X	X	X	X	X	X
Indicated airspeed or calibrated airspeed.	X	X	X	X	X	X	X
Air-ground status and each landing gear air-ground sensor, when practicable	X	X					
Total or outside air temperature	X	X	X	X	X	X	X
Heading (primary flight crew reference)	X	X	X	X	X	X	X
Normal acceleration	X	X	X	X	X	X	X
Lateral acceleration	X	X			X		X
Longitudinal acceleration (body axis)	X	X			X		X
Time or relative time count	X	X	X	X	X	X	X
Navigation data*: drift angle, wind speed, wind direction, latitude/longitude.	X	X			X		X
Groundspeed*	X	X			X		X
Radio altitude*.	X	X			X		X
Requirements for ATTITUDE:							
Pitch attitude	X	X	X	X	X	X	X
Roll attitude	X	X	X	X	X	X	X
Yaw or sideslip angle*		X					X
Yaw rate (acceleration)					X		X
Angle of attack*		X					
Requirements for ENGINE POWER:							
Engine thrust/power: propulsive thrust/power on each engine,	X	X	X	X	X	X	X
Cockpit thrust/power lever position	X	X					
Thrust reverse status*	X	X	X	X	X	X	
Engine thrust command*		X					
Engine thrust target*		X					
Engine bleed valve position*		X					

Additional engine parameters*: EPR, N1, indicated vibration level, N2, EGT, TLA, fuel flow, fuel cut-off lever position, N3		X					
Power on each engine: free power turbine speed (N)1) engine torque, engine gas generator speed (Ng) cockpit power control position.							X
Rotor: main rotor speed, rotor brake					X	X	X
Main gearbox oil pressure*					X		X
Gearbox oil temperature*: main gearbox oil temperature, intermediate gearbox oil temperature; tail rotor gearbox oil temperature					X		X
Engine exhaust gas temperature (T4)*							X
Turbine inlet temperature (TIT)*							X
Requirements for CONFIGURATION:							
Pitch trim surface position	X	X					
Flaps*: trailing edge flap position, cockpit control selection	X	X	X	X			
TYPE OF FLIGHT DATA RECORDER:	I	IA	II	IIA	IV	V	IVA
Slats*: leading edge flap (slat) position, cockpit control selection	X	X	X	X			
Landing gear*: landing gear, gear selector positions	X	X			X		X
Yaw trim surface position*		X					
Roll trim surface position*		X					
Cockpit trim control input position pitch*		X					
Cockpit trim control input position roll*		X					
Cockpit trim control input position yaw*		X					
Ground spoiler and speed brake*: Ground spoiler position, ground spoiler selection, speed brake position, speed brake selection	X	X	X	X			
De-icing and/or anti-icing systems selection*		X					
Ice detector liquid water content*							X
Hydraulic pressure (each system)*	X	X					
Fuel quantity*		X					X
AC electrical bus status*		X					
DC electrical bus status*		X					
APU bleed valve position*		X					
Computed center of gravity*		X					
Requirements for OPERATION:							
Master Warnings	X	X			X		X
Warnings		X					X

Primary flight control surface and primary flight control pilot input: pitch axis, roll axis, yaw axis	X	X					
Primary Flight Controls. Pilot input and/or control output position; collective pitch, longitudinal cyclic pitch, lateral cyclic pitch, tail rotor pedal, controllable stabilator, hydraulic selection.					X	X	X
Marker beacon passage	X	X			X		X
Each navigation receiver frequency selection	X	X			X		X
Hydraulics low pressure					X	X	X
Stability augmentation system engagement*					X	X	X
Indicated sling load force*					X		X
Altitude rate*							X
Ice detector liquid water content*							X
TYPE OF FLIGHT DATA RECORDER:	I	IA	II	IIA	IV	V	IVA
Helicopter health and usage monitor system (HUMS)*: engine data chip detectors, track timing, exceedance discretes, broadband average engine vibration							X
Manual radio transmission keying and CVR/FDR synchronization reference	X	X	X	X	X	X	X
Autopilot/autothrottle/AFCS mode and engagement status*	X	X	X	X	X	X	X
Selected barometric setting*: pilot, first officer		X					
Selected altitude (all pilot selectable modes of operation)*		X					
Selected speed (all pilot selectable modes of operation)*		X					
Selected Mach (all pilot selectable modes of operation)*		X					
Selected vertical speed (all pilot selectable modes of operation)*		X					
Selected heading (all pilot selectable modes of operation)*		X					
Selected flight path (all pilot selectable modes of operation)*: course/DSTRK, path angle		X					
Selected decision height*		X					
EFIS display format*: pilot, first officer		X					
Multi-function/engine/alerts display format*		X					

GPWS/TAWS/GCAS status*: selection of terrain display mode including pop-up display status, terrain alerts, both cautions and warnings, and advisories, on/off switch position	X	X					
Low pressure warning*: hydraulic pressure, pneumatic pressure		X					
Computer failure*		X					
Loss of cabin pressure		X					
TCAS/ACAS (traffic alert and collision avoidance system/airborne collision avoidance system)*		X					
Ice detection*		X					
Engine warning each engine vibration*		X					
Engine warning each engine over temperature*		X					
Engine warning each engine oil pressure low*		X					
Engine warning each engine over speed*		X					
TYPE OF FLIGHT DATA RECORDER:	I	IA	II	IIA	IV	V	IVA
Wind shear warning*		X					
Operational stall protection, stick shaker and pusher activation*		X					
All cockpit flight control input forces*: control wheel, control column, rudder pedal cockpit input forces		X					
Vertical deviation*: ILS glide patch, MLS elevation, GNSS approach path	X	X			X		X
Horizontal deviation*: ILS localizer, MLS azimuth, GNSS approach path	X	X			X		X
DME 1 and 2 distances	X	X			X		X
Primary navigation system reference*: GNSS, INS, VOR/DME, MLS, Loran-C, ILS	X	X					
Brakes*: left and right brake pressure, left and right brake pedal position		X					
Date*		X					
Event Marker*		X					
Head-up display in use*		X					
Para visual display on*		X					

APPENDIX 1 TO 7.210: EMERGENCY EXIT EQUIPMENT

- (a) The assisting means for a floor level emergency exit shall meet the requirements under which the aeroplane was type certified.

- (b) The location of each passenger emergency exit shall be -
 - (1) recognisable from a distance equal to the width of the cabin;
 - (2) indicated by a sign visible to occupants approaching along the main passenger aisle.
- (c) There shall be an emergency exit locating sign -
 - (1) above the aisle near each over-the-wing passenger emergency exit, or at another ceiling location if it is more practical because of low headroom;
 - (2) next to each floor level passenger emergency exit, except that one sign may serve two such exits if they both can be seen readily from that sign; and
 - (3) on each bulkhead or divider that prevents fore and aft vision along the passenger cabin, to indicate emergency exits beyond and obscured by it, except that if this is not possible, the sign may be placed at another appropriate location.
- (d) Each passenger emergency exit marking and each locating sign shall be manufactured to meet the interior emergency exit marking requirements under which the aeroplane was type certified, unless the Authority cites different requirements for compliance with this paragraph.

(Note: No sign shall continue to be used if its luminescence (brightness) decreases to below 250 microlamberts.)

- (e) Sources of general cabin illumination may be common to both the emergency and the main lighting systems if the power supply to the emergency light system is independent of the power supply to the main lighting system.
- (f) The emergency lighting system shall provide enough general lighting in the passenger cabin so that the average illumination, when measured at 40-inch intervals at seat armrest height, on the centerline of the main passenger aisle, is at least 0.05 foot-candles.
- (g) Each emergency light shall –
 - (1) be operable manually both from the flight crew station and from a point in the passenger compartment that is readily accessible to a normal flight attendant seat;
 - (2) have a means to prevent inadvertent operation of the manual controls;
 - (3) when armed or turned on at either station, remain lighted or become lighted upon interruption of the aeroplane's normal electric power;
 - (4) provide the required level of illumination for at least 10 minutes at the critical ambient conditions after emergency landing; and
 - (5) have a cockpit control device that has an "on", "off", and "armed" position.
- (h) The location of each passenger emergency exit operating handle and instructions for opening the exit shall be shown in accordance with the requirements under which the aeroplane was type certified, unless the Authority cites different requirements for compliance with this paragraph.
- (i) No operating handle or operating handle cover shall continue to be used if its luminescence (brightness) decreases to below 100 microlamberts.
- (j) Access to emergency exits shall be provided as follows for each passenger carrying aeroplane -
 - (1) each passageway between individual passenger areas, or leading to a Type I or Type II emergency exit, shall be unobstructed and at least 20 inches wide;
 - (2) there shall be enough space next to each Type I or Type II emergency exit to allow a crewmember to assist in the evacuation of passengers without reducing the unobstructed width of the passageway below that required in paragraph (j)1. of this section;
 - (3) there shall be access from the main aisle to each Type III and Type IV exit. The access from the aisle to these exits shall not be obstructed by seats, berths, or other protrusions in a manner that would reduce the effectiveness of the exit. In addition, the access shall meet the emergency exit access requirements under which the aeroplane was type certificated, unless the Authority cites different requirements for compliance with this paragraph;
 - (4) if it is necessary to pass through a passageway between passenger compartments to reach any required emergency exit from any seat in the passenger cabin, the passageway shall not

be obstructed. However, curtains may be used if they allow free entry through the passageway;

- (5) no door shall be installed in any partition between passenger compartments;
 - (6) if it is necessary to pass through a doorway separating the passenger cabin from other areas to reach any required emergency exit from any passenger seat, the door shall have a means to latch it in the open position, and the door shall be latched open during each takeoff and landing. The latching means shall be able to withstand the loads imposed upon it when the door is subjected to the ultimate inertia forces, relative to the surrounding structure, prescribed in the airworthiness standards for type certification in the transport category as cited by the Authority.
- (k) Each passenger emergency exit and the means of opening that exit from the outside shall be marked on the outside of the aeroplane with a 2-inch coloured band outlining the exit on the side of the fuselage.
- (l) Each passenger emergency exit marking, including the band, shall be readily distinguishable from the surrounding fuselage area by contrast in colour and shall comply with the following -
- (1) if the reflectance of the darker colour is 15 percent or less, the reflectance of the lighter colour shall be at least 45 percent;
 - (2) if the reflectance of the darker colour is greater than 15 percent, at least a 30 percent difference between its reflectance and the reflectance of the lighter colour shall be provided; and
- (Note: "Reflectance" is the ratio of the luminous flux reflected by a body to the luminous flux it receives.)*
- (3) exits that are not in the side of the fuselage shall have external means of opening and applicable instructions marked conspicuously in red or, if red is inconspicuous against the background colour, in bright chrome yellow, and when the means of opening such an exit is located on only one side of the fuselage, a conspicuous marking to that effect shall be provided on the other side.
- (m) Each passenger-carrying aeroplane shall be equipped with exterior lighting that meets the requirements under which that aeroplane was type certificated, unless the Authority cites different requirements for compliance with this paragraph.
- (n) Each passenger-carrying aeroplane shall be equipped with a slip-resistant escape route that meets the requirements under which that aeroplane was type certificated, unless the Authority cites different requirements for compliance with this paragraph.
- (o) Each floor level door or exit in the side of the fuselage (other than those leading into a cargo or baggage compartment that is not accessible from the passenger cabin) that is 44 or more inches high and 20 or more inches wide, but not wider than 46 inches and each passenger ventral exit and each tail cone exit shall meet the requirements of this section for floor level emergency exits.
- (Note: The Authority may grant a deviation from this paragraph if it is deemed that circumstances make full compliance impractical and that an acceptable level of safety has been achieved.)*
- (p) Approved emergency exits in the passenger compartments that are in excess of the minimum number of required emergency exits shall meet all of the applicable provisions of this subsection section and shall be readily accessible.
- (q) On each large passenger-carrying turbojet powered aeroplane each ventral exit and tail cone exit shall be -
- (1) designed and constructed so that it cannot be opened during flight; and
 - (2) marked with a placard readable from a distance of 30 inches and installed at a conspicuous location near the means of opening the exit, stating that the exit has been designed and constructed so that it cannot be opened during flight.

APPENDIX 1 TO 7.240: FIRST AID KIT REQUIRED CONTENTS

The following is the minimum contents that shall be in a first aid kit for carriage on board an aircraft -

- (1) a handbook on first aid;
- (2) ground to air visual signal code for use by survivors as contained in ICAO Annex 12;
- (3) materials for treating injuries;
- (4) ophthalmic ointment;
- (5) a decongestant spray;
- (6) insect repellent;
- (7) emollient eye drops;
- (8) sunburn cream;
- (9) water-miscible antiseptic/skin cleanser;
- (10) materials for treatment of extensive burns;
- (11) oral drugs as follows: analgesic, antispasmodic, central nervous system stimulant, circulatory stimulant, coronary vasodilator, antidiarrhoeic and motion sickness medications; and
- (12) an artificial plastic airway and splints.

APPENDIX 1 TO 7.245: MEDICAL KIT REQUIRED CONTENTS

The following is the minimum contents that shall be in a medical kit for carriage on board an Aircraft -

- (1) Equipment -
 - (i) one pair of sterile surgical gloves;
 - (ii) sphygmomanometer;
 - (iii) stethoscope;
 - (iv) sterile Scissors;
 - (v) haemosatic forceps;
 - (vi) haemosatic bandages or tourniquet;
 - (vii) sterile equipment for suturing wounds;
 - (viii) disposable syringes and needles; and
 - (ix) disposable scalpel handle and blade.
- (2) Drugs -
 - (i) coronary vasodilators;
 - (ii) analgesics;
 - (iii) diuretics;
 - (iv) anti-allergics;
 - (v) steroids;
 - (vi) sedatives;
 - (vii) ergometrine;
 - (viii) injectable broncho dilator; and
 - (ix) where compatible with the regulations of the appropriate Authority, a narcotic drug in injectable form.

(Note: The United Nations Conference for adoption of a Single Convention on narcotic drugs in March 1961 adopted such a convention, Article 32 of which contains special provisions concerning the carriage of drugs in medical kits of aircraft engaged in international flight.)

APPENDIX 1 TO 7.270: SUPPLEMENTAL OXYGEN – NON PRESSURIZED AIRCRAFT

The supplemental oxygen supply requirements for non-pressurized aircraft are as follows -

- (1) Flight Crewmembers. Each member of the flight crew on flight deck duty shall be supplied with supplemental oxygen in accordance with Table 1. If all occupants of flight deck seats are supplied from the flight crew source of oxygen supply then they shall be considered as flight crewmembers on flight deck duty for the purpose of oxygen supply; and
- (2) Cabin Crewmembers, Additional Crewmembers and Passengers. Cabin crewmembers and passengers shall be supplied with oxygen in accordance with Table 1. Cabin crewmembers carried in addition to the minimum number of cabin crewmembers required, and additional crewmembers, shall be considered as passengers for the purpose of oxygen supply.

Table 1 - Requirements for Supplemental Oxygen – Non-Pressurized Aircraft

SUPPLY FOR:	DURATION AND PRESSURE ALTITUDE
1. All occupants of flight deck seats on flight deck duty	Entire flight time at pressure altitudes above 10,000 feet
2. All required cabin crewmembers	Entire flight time at pressure altitudes above 13,000 ft and for any period exceeding 30 minutes at pressure altitudes above 10,000 ft, but not exceeding 13,000 ft
3. 100% of passengers	Entire flight time at pressure altitudes above 13,000 ft
4. 10% of passengers	Entire flight time after 30 minutes at pressure altitudes greater than 10,000 ft, but not exceeding 13,000 ft

APPENDIX 2 TO 7.270: SUPPLEMENTAL OXYGEN – PRESSURIZED AIRCRAFT

The supplemental oxygen supply requirements for pressurized aircraft are as follows -

- (1) the amount of supplemental oxygen required shall be determined on the basis of cabin pressure altitude, flight duration and the assumption that a cabin pressurisation failure will occur at the altitude or point of flight that is most critical from the standpoint of oxygen need, and that after the failure, the aeroplane will descend in accordance with emergency procedures specified in the Aeroplane Flight Manual to a safe altitude for the route to be flown that will allow continued safe flight and landing;
- (2) following a cabin pressurisation failure, the cabin pressure altitude shall be considered the same as the aeroplane altitude, unless it is demonstrated to the Authority that no probable failure of the cabin or pressurisation system will result in a cabin pressure altitude equal to the aeroplane altitude. Under these circumstances, this lower cabin pressure altitude may be used as a basis for determination of oxygen supply;
- (3) Flight Crewmembers. Each member of the flight crew on flight deck duty shall be supplied with supplemental oxygen in accordance with Table 2. If all occupants of flight deck seats are supplied from the flight crew source of oxygen supply then they shall be considered as flight crewmembers on flight deck duty for the purpose of oxygen supply. Flight deck seat occupants, not supplied by the flight crew source, are to be considered as passengers for the purpose of oxygen supply.
- (4) Cabin Crewmembers, Additional Crewmembers and Passengers.
 - (i) cabin crewmembers and passengers shall be supplied with supplemental oxygen in accordance with Table 2. Cabin crewmembers carried in addition to the minimum number of cabin crewmembers required, and additional crewmembers, shall be considered as passengers for the purpose of oxygen supply; and
 - (ii) the oxygen supply requirements, as specified in Table 2, for aeroplanes not certificated to fly at altitudes above 25,000 ft, may be reduced to the entire flight time between 10,000 ft and 14,000 ft cabin pressure altitudes for all required cabin crewmembers and for at least 10% of the passengers if at all points along the route to be flown, the aeroplane is able to descend safely within 4 minutes to a cabin pressure altitude of 14,000 ft.

Table 2 - Requirements for Supplemental Oxygen - Pressurized Aeroplane During and Following Emergency Descent (Note 1)

SUPPLY FOR:	DURATION AND CABIN PRESSURE ALTITUDE
All occupants of flight deck seats on flight deck duty flight	Entire flight time when the cabin pressure altitude exceeds 13,000 and entire time when the cabin pressure altitude exceeds 10,000 ft but does not exceed 13,000 ft after the first 30 minutes at those altitudes, but in no case less than:

	(i) 30 minutes for aeroplanes certificated to fly at altitudes not exceeding 25,000 ft (Note 2) (ii) 2 hours for aeroplanes certificated to fly at altitudes more than 25,000 ft (Note 3).
All required cabin crewmembers	Entire flight time when cabin pressure altitude exceeds 13,000 ft but not less than 30 minutes (Note 2), and entire flight time when cabin pressure altitude is greater than 10,000 ft but does not exceed 13,000 ft after the first 30 minutes at these altitudes.
100% of passengers	10 minutes or the entire flight time when the cabin pressure altitude exceeds 15,000 ft whichever is the greater (Note 4)
30% of passengers	Entire flight time when the cabin pressure altitude exceeds 14,000 ft but does not exceed 15,000 ft
10% of passengers	Entire flight time when the cabin pressure altitude exceeds 10,000 ft but does not exceed 14,000 ft after the first 30 minutes at these altitudes.

(Note 1: *The supply provided shall take account of the cabin pressure altitude and descent profile for the routes concerned.*)

(Note 2: *The required minimum supply is that quantity of oxygen necessary for a constant rate of descent from the aeroplane's maximum certificated operating altitude to 10,000 ft in 10 minutes and followed by 20 minutes at 10,000 ft.*)

(Note 3: *The required minimum supply is that quantity of oxygen necessary for a constant rate of descent from the aeroplane's maximum certificated operating altitude to 10,000 ft in 10 minutes and followed by 110 minutes at 10,000 ft. The oxygen required to meet the Crew Protective Breathing Equipment provisions of this Schedule may be included in determining the supply required.*)

(Note 4: *The required minimum supply is that quantity of oxygen necessary for a constant rate of descent from the aeroplane's maximum certificated operating altitude to 15,000 ft.*)