Subpart D – Instrument, data, equipment

Section 1 – Aeroplanes

GM1 CAT.IDE.A.100(b) Instruments and equipment – general

INSTRUMENTS AND EQUIPMENT THAT DO NOT NEED TO BE APPROVED IN ACCORDANCE WITH REGULATION (EC) NO 748/2012, BUT ARE CARRIED ON A FLIGHT

(a) The provision of this paragraph does not exempt the item of equipment from complying with Regulation (EC) No 748/2012[6] if the instrument or equipment is installed in the aeroplane. In this case, the installation should be approved as required in Regulation (EC) No 748/2012 and should comply with the applicable airworthiness codes as required under the same Regulation.

(b) The functionality of non-installed instruments and equipment required by this Subpart and that do not need an equipment approval should be checked against recognised industry standards appropriate to the intended purpose. The operator is responsible for ensuring the maintenance of these instruments and equipment.

(c) The failure of additional non-installed instruments or equipment not required by this Part or by Regulation (EC) No 748/2012 or any applicable airspace requirements should not adversely affect the airworthiness and/or the safe operation of the aeroplane. Examples are the following:

(1) instruments supplying additional flight information (e.g. stand-alone global positioning system (GPS));

(2) mission dedicated equipment (e.g. radios); and

(3) non-installed passenger entertainment equipment.

GM1 CAT.IDE.A.100(d) Instruments and equipment - general

POSITIONING OF INSTRUMENTS

This requirement implies that whenever a single instrument is required to be installed in an aeroplane operated in a multi-crew environment, the instrument needs to be visible from each flight crew station.

GM1 CAT.IDE.A.110 Spare electrical fuses

FUSES

A 'spare electrical fuse' means a replaceable fuse in the flight crew compartment, not an automatic circuit breaker, or circuit breakers in the electric compartments.

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6 OJ L 243, 27.9.2003, p. 6.

AMC1 CAT.IDE.A.120 Equipment to clear windshield

MEANS TO MAINTAIN A CLEAR PORTION OF THE WINDSHIELD DURING PRECIPITATION

The means used to maintain a clear portion of the windshield during precipitation should be windshield wipers or an equivalent.

AMC1 CAT.IDE.A.125&CAT.IDE.A.130 Operations under VFR by day & Operations under IFR or at night – flight and navigational instruments and associated equipment

INTEGRATED INSTRUMENTS

(a) Individual equipment requirements may be met by combinations of instruments, by integrated flight systems or by a combination of parameters on electronic displays, provided that the information so available to each required pilot is not less than that required in the applicable operational requirements, and the equivalent safety of the installation has been shown during type certification approval of the aeroplane for the intended type of operation.

(b) The means of measuring and indicating turn and slip, aeroplane attitude and stabilised aeroplane heading may be met by combinations of instruments or by integrated flight director systems, provided that the safeguards against total failure, inherent in the three separate instruments, are retained.

AMC2 CAT.IDE.A.125 Operations under VFR by day – flight and navigational instruments and associated equipment

LOCAL FLIGHTS

For flights that do not exceed 60 minutes' duration, that take off and land at the same aerodrome and that remain within 50 NM of that aerodrome, an equivalent means of complying with CAT.IDE.A.125 (a)(1)(vi) may be:

(a) a turn and slip indicator;

(b) a turn coordinator; or

(c) both an attitude indicator and a slip indicator.

AMC1 CAT.IDE.A.125(a)(1)(i)&CAT.IDE.A.130(a)(1) Operations under VFR by day & Operations under IFR or at night – flight and navigational instruments and associated equipment

MEANS OF MEASURING AND DISPLAYING MAGNETIC HEADING

The means of measuring and displaying magnetic direction should be a magnetic compass or equivalent.

AMC1 CAT.IDE.A.125(a)(1)(ii)&CAT.IDE.A.130(a)(2) Operations under VFR by day & Operations under IFR or at night – flight and navigational instruments and associated equipment

MEANS OF MEASURING AND DISPLAYING THE TIME

An acceptable means of compliance is a clock displaying hours, minutes and seconds, with a sweep-second pointer or digital presentation.

AMC1 CAT.IDE.A.125(a)(1)(iii)&CAT.IDE.A.130(b) Operations under VFR by day & Operations under IFR or at night – flight and navigational instruments and associated equipment

CALIBRATION OF THE MEANS OF MEASURING AND DISPLAYING PRESSURE ALTITUDE

The instrument measuring and displaying pressure altitude should be of a sensitive type calibrated in feet (ft), with a sub-scale setting, calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight.

AMC1 CAT.IDE.A.125(a)(1)(iv)&CAT.IDE.A.130(a)(3) Operations under VFR by day & Operations under IFR or at night – flight and navigational instruments and associated equipment

CALIBRATION OF THE INSTRUMENT INDICATING AIRSPEED

The instrument indicating airspeed should be calibrated in knots (kt).

AMC1 CAT.IDE.A.130(a)(5) Operations under IFR or at night – flight and navigational instruments and associated equipment

SLIP INDICATOR

If only slip indication is provided, the means of measuring and displaying standby attitude should be certified according to CS 25.1303 (b)(4) or equivalent.

AMC2 CAT.IDE.A.130(b) Operations under IFR or at night – flight and navigational instruments and associated equipment

ALTIMETERS – IFR OR NIGHT OPERATIONS

Except for unpressurised aeroplanes operating below 10 000 feet, the altimeters of aeroplanes operating under IFR or at night should have counter drum-pointer or equivalent presentation.

AMC1 CAT.IDE.A.125(a)(1)(ix)&CAT.IDE.A.130(a)(8) Operations under VFR by day & operations under IFR or at night – flight and navigational instruments and associated equipment

MEANS OF DISPLAYING OUTSIDE AIR TEMPERATURE

(a) The means of displaying outside air temperature should be calibrated in degrees Celsius.

(b) The means of displaying outside air temperature may be an air temperature indicator that provides indications that are convertible to outside air temperature.

AMC1 CAT.IDE.A.125(b)&CAT.IDE.A.130(h) Operations under VFR by day & Operations under IFR or at night – flight and navigational instruments and associated equipment

MULTI-PILOT OPERATIONS - DUPLICATE INSTRUMENTS

Duplicate instruments should include separate displays for each pilot and separate selectors or other associated equipment where appropriate.

AMC1 CAT.IDE.A.125(c)&CAT.IDE.A.130(d) Operations under VFR by day & Operations under IFR or at night – flight and navigational instruments and associated equipment

MEANS OF PREVENTING MALFUNCTION DUE TO CONDENSATION OR ICING

The means of preventing malfunction due to either condensation or icing of the airspeed indicating system should be a heated pitot tube or equivalent.

AMC1 CAT.IDE.A.130(e) Operations under IFR or at night – flight and navigational instruments and associated equipment

MEANS OF INDICATING FAILURE OF THE AIRSPEED INDICATING SYSTEM'S MEANS OF PREVENTING MALFUNCTION DUE TO EITHER CONDENSATION OR ICING

A combined means of indicating failure of the airspeed indicating system's means of preventing malfunction due to either condensation or icing is acceptable provided that it is visible from each flight crew station and that there is a means to identify the failed heater in systems with two or more sensors.

AMC1 CAT.IDE.A.130(i)(5) Operations under IFR or at night – flight and navigational instruments and associated equipment

ILLUMINATION OF STANDBY MEANS OF MEASURING AND DISPLAYING ATTITUDE

The standby means of measuring and displaying attitude should be illuminated so as to be clearly visible under all conditions of daylight and artificial lighting.

AMC1 CAT.IDE.A.130(j) Operations under IFR or at night – flight and navigational instruments and associated equipment

CHART HOLDER

An acceptable means of compliance with the chart holder requirement is to display a pre-composed chart on an electronic flight bag (EFB).

GM1 CAT.IDE.A.125&CAT.IDE.A.130 Operations under VFR by day & Operations under IFR or at night – flight and navigational instruments and associated equipment

SUMMARY TABLE

Table 1: Flight and navigational instruments and associated equipment

SERIAL		FLIGHTS UNDER VFR		FLIGHTS UNDER IFR OR AT NIGHT	
INSTRUMENT		SINGLE PILOT	TWO PILOTS REQUIRED	SINGLE PILOT	TWO PILOTS REQUIRED
	(a)	(b)	(c)	(d)	(e)
1	Magnetic direction	1	1	1	1
2	Time	1	1	1	1
3	Pressure altitude	1	2	2 Note (5)	2 Note (5)
4	Indicated airspeed	1	2	1	2
5	Vertical speed	1	2	1	2
6	Turn and slip or turn coordinator	1 Note (1)	2 Note (1) & Note (2)	1 Note (4)	2 Note (4)
7	Attitude	1 Note (1)	2 Note (1) & Note (2)	1	2
8	Stabilised direction	1 Note (1)	2 Note (1) & Note (2)	1	2
9	Outside air temperature	1	1	1	1
10	Mach number indicator	See Note (3)			
11	Airspeed icing protection	1 Note (6)	2 Note (6)	1	2
12	Airspeed icing protection failure indicating			1 Note (7)	2 Note (7)
13	Static pressure source			2	2
14	Standby attitude indicator			1 Note (8)	1 Note (8)
15	Chart holder			1 Note (6)	1 Note (6)

Note (1) For local flights (A to A, 50 NM radius, not more than 60 minutes' duration) the instruments at serials (a)(6) and (a)(8) may be replaced by either a turn and slip indicator, or a turn coordinator, or both an attitude indicator and a slip indicator.

Note (2) The substitute instruments permitted by Note (1) above should be provided at each pilot's station.

Note (3) A Mach number indicator is required for each pilot whenever compressibility limitations are not otherwise indicated by airspeed indicators.

Note (4) For IFR or at night, a turn and slip indicator, or a slip indicator and a third (standby) attitude indicator certified according to CS 25.1303 (b)(4) or equivalent, is required.

Note (5) Except for unpressurised aeroplanes operating below 10 000 ft, neither three pointers, nor drum-pointer altimeters satisfy the requirement.

Note (6) Applicable only to aeroplanes with a maximum certified take-off mass (MCTOM) of more than 5 700 kg, or with an MOPSC of more than nine. It also applies to all aeroplanes first issued with an individual certificate of airworthiness (CofA) on or after 1 April 1999.

Note (7) The pitot heater failure annunciation applies to any aeroplane issued with an individual CofA on or after 1 April 1998. It also applies before that date when: the aeroplane has an MCTOM of more than 5 700 kg and an MOPSC greater than nine.

Note (8) Applicable only to aeroplanes with an MCTOM of more than 5 700 kg, or with an MPSCMOPSC of more than nine.

AMC1 CAT.IDE.A.150 Terrain awareness warning system (TAWS)

EXCESSIVE DOWNWARDS GLIDE SLOPE DEVIATION WARNING FOR CLASS A TAWS

The requirement for a Class A TAWS to provide a warning to the flight crew for excessive downwards glide slope deviation should apply to all final approach glide slopes with angular vertical navigation (VNAV) guidance, whether provided by the instrument landing system (ILS), microwave landing system (MLS), satellite based augmentation system approach procedure with vertical guidance (SBAS APV (localiser performance with vertical guidance approach LPV)), ground-based augmentation system (GBAS (GPS landing system, GLS) or any other systems providing similar guidance. The same requirement should not apply to systems providing vertical guidance based on barometric VNAV.

GM1 CAT.IDE.A.150 Terrain awareness warning system (TAWS)

ACCEPTABLE STANDARD FOR TAWS

An acceptable standard for Class A and Class B TAWS may be the applicable European technical standards order (ETSO) issued by the Agency or equivalent.

AMC1 CAT.IDE.A.160 Airborne weather detecting equipment

GENERAL

The airborne weather detecting equipment should be an airborne weather radar, except for propeller-driven pressurised aeroplanes with an MCTOM not more than 5 700 kg and an MOPSC of not more than nine, for which other equipment capable of detecting thunderstorms and other potentially hazardous weather conditions, regarded as detectable with airborne weather radar equipment, are also acceptable.

AMC1 CAT.IDE.A.170 Flight crew interphone system

TYPE OF FLIGHT CREW INTERPHONE

The flight crew interphone system should not be of a handheld type.

AMC1 CAT.IDE.A.175 Crew member interphone system

SPECIFICATIONS

The crew member interphone system should:

(a) operate independently of the public address system except for handsets, headsets, microphones, selector switches and signalling devices;

(b) in the case of aeroplanes where at least one cabin crew member is required, be readily accessible for use at required cabin crew member stations close to each separate or pair of floor level emergency exits;

(c) in the case of aeroplanes where at least one cabin crew member is required, have an alerting system incorporating aural or visual signals for use by flight and cabin crew;

(d) have a means for the recipient of a call to determine whether it is a normal call or an emergency call that uses:

(1) lights of different colours;

(2) codes defined by the operator (e.g. different number of rings for normal and emergency calls); and

(3) any other indicating signal specified in the operations manual;

(e) provide two-way communication between:

(1) the flight crew compartment and each passenger compartment, in the case of aeroplanes where at least one cabin crew member is required;

(2) the flight crew compartment and each galley located other than on a passenger deck level, in the case of aeroplanes where at least one cabin crew member is required;

(3) the flight crew compartment and each remote crew compartment and crew member station that is not on the passenger deck and is not accessible from a passenger compartment; and

(4) ground personnel and at least two flight crew members. This interphone system for use by the ground personnel should be, where practicable, so located that the personnel using the system may avoid detection from within the aeroplane;

and

(f) be readily accessible for use from each required flight crew station in the flight crew compartment.

AMC1 CAT.IDE.A.180 Public address system

SPECIFICATIONS

The public address system should:

(a) operate independently of the interphone systems except for handsets, headsets, microphones, selector switches and signalling devices;

(b) be readily accessible for immediate use from each required flight crew station;

(c) have, for each floor level passenger emergency exit that has an adjacent cabin crew seat, a microphone operable by the seated cabin crew member, except that one microphone may serve more than one exit, provided the proximity of exits allows unassisted verbal communication between seated cabin crew members;

(d) be operable within 10 seconds by a cabin crew member at each of those stations; and

(e) be audible at all passenger seats, lavatories, galleys, cabin crew seats and work stations, and other crew remote areas.

AMC1 CAT.IDE.A.185 Cockpit voice recorder

OPERATIONAL PERFORMANCE REQUIREMENTS

(a) For aeroplanes first issued with an individual CofA on or after 1 April 1998 and before 1 January 2016, the operational performance requirements for cockpit voice recorders (CVRs) should be those laid down in the European Organisation for Civil Aviation Equipment (EUROCAE) Document ED-56A (Minimum Operational Performance Requirements For Cockpit Voice Recorder Systems) dated December 1993, or EUROCAE Document ED-112 (Minimum Operational Performance Specification for Crash Protected Airborne Recorder Systems) dated March 2003, including amendments n°1 and n°2 , or any later equivalent standard produced by EUROCAE.

(b) For aeroplanes first issued with an individual CofA on or after 1 January 2016, the operational performance requirements for CVRs should be those laid down in EUROCAE Document ED-112 (Minimum Operational Performance Specification for Crash Protected Airborne Recorder Systems) dated March 2003, including amendments n°1 and n°2, or any later equivalent standard produced by EUROCAE.

AMC1 CAT.IDE.A.190 Flight data recorder

OPERATIONAL PERFORMANCE REQUIREMENTS FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL CofA ON OR AFTER 1 JANUARY 2016

(a) The operational performance requirements for flight data recorders (FDRs) should be those laid down in EUROCAE Document ED-112 (Minimum Operational Performance Specification for Crash Protected Airborne Recorder Systems) dated March 2003, including amendments n°1 and n°2, or any later equivalent standard produced by EUROCAE.

(b) The FDR should record with reference to a timescale the list of parameters in Table 1 and Table 2, as applicable.

(c) The parameters to be recorded should meet the performance specifications (range, sampling intervals, accuracy limits and resolution in read-out) as defined in the relevant tables of EUROCAE Document ED-112, including amendments n°1 and n°2, or any later equivalent standard produced by EUROCAE.

Table 1: FDR – all aeroplanes

No*	Parameter
1a	Time; or
1b	Relative time count
1c	Global navigation satellite system (GNSS) time synchronisation
2	Pressure altitude
3a	Indicated airspeed; or Calibrated airspeed
4	Heading (primary flight crew reference) - when true or magnetic heading can be selected, the primary heading reference, a discrete indicating selection, should be recorded
5	Normal acceleration
6	Pitch attitude
7	Roll attitude
8	Manual radio transmission keying and CVR/FDR synchronisation reference.
9	Engine thrust/power
9a	Parameters required to determine propulsive thrust/power on each engine
9b	Flight crew compartment thrust/power lever position for aeroplanes with non-mechanically linked flight crew compartment - engine control
14	Total or outside air temperature
16	Longitudinal acceleration (body axis)
17	Lateral acceleration
18	Primary flight control surface and primary flight control pilot input (for multiple or split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately. For aeroplanes that have a flight control break-away capability that allows either pilot to operate the controls independently, record both inputs):
18a	Pitch axis
18b	Roll axis
18c	Yaw axis
19	Pitch trim surface position
23	Marker beacon passage
24	Warnings - in addition to the master warning each 'red' warning (including smoke warnings from other compartments) should be recorded when the warning condition cannot be determined from other parameters or from the CVR
25	Each navigation receiver frequency selection
27	Air - ground status and, if the sensor is installed, each landing gear
75	All flight control input forces (for fly-by-wire flight control systems, where control surface position is a function of the displacement of the control input device only, it is not necessary to record this parameter):
75a	Control wheel
75b	Control column
75c	Rudder pedal

* The number in the left hand column reflects the serial number depicted in EUROCAE ED-112.

Table 2: FDR - Aeroplanes for which the data source for the parameter is either used by aeroplane systems or is available on the instrument panel for use by the flight crew to operate the aeroplane

No*	Parameter
10	Flaps
10a	Trailing edge flap position
10b	Flight crew compartment control selection
11	Slats
11a	Leading edge flap (slat) position
11b	Flight crew compartment control selection
12	Thrust reverse status
13	Ground spoiler and speed brake
13a	Ground spoiler position
13b	Ground spoiler selection
13c	Speed brake position
13d	Speed brake selection
15	Autopilot, autothrottle and AFCS mode and engagement status
20	Radio altitude. For auto-land/Category III operations, each radio altimeter should be recorded.
21	Vertical deviation - the approach aid in use should be recorded. For auto-land/Category III operations, each system should be recorded.
	ILS/GPS/GLS glide path
21a	MLS elevation
21b	GNSS approach path / IRNAV vertical deviation
21c	
22	Horizontal deviation - the approach aid in use should be recorded. For auto land/Category III operations, each system should be recorded. ILS/GPS/GLS localiser
	MLS azimuth
	GNSS approach path/IRNAV lateral deviation
22a	
22b	
22c	
26	Distance measuring equipment (DME) 1 and 2 distances
26a	Distance to runway threshold (GLS)
26b	Distance to missed approach point (IRNAV/IAN)
28	Ground proximity warning system (GPWS) / terrain awareness warning system (TAWS) / ground collision avoidance system (GCAS) status:
28a	Selection of terrain display mode, including pop-up display status
28b	Terrain alerts, including cautions and warnings and advisories
28c	On/off switch position
29	Angle of attack
30	Low pressure warning (each system):
30a	Hydraulic pressure

No*	Parameter
30b	Pneumatic pressure
31	Ground speed
32	Landing gear:
32a	Landing gear
32b	Gear selector position
33	Navigation data:
33a	Drift angle
33b	Wind speed
33c	Wind direction
33d	Latitude
33e	Longitude
33f	GNSS augmentation in use
34	Brakes:
34a	Left and right brake pressure
34b	Left and right brake pedal position
35	Additional engine parameters (if not already recorded in parameter 9 of Table 1 of AMC1 CAT.IDE.190.A and if the aeroplane is equipped with a suitable data source):
35a	Engine pressure ratio (EPR)
35b	N1
35c	Indicated vibration level
35d	N2
35e	Exhaust gas temperature (EGT)
35f	Fuel flow
35g	Fuel cut-off lever position
35h	N3
36	Traffic alert and collision avoidance system (TCAS) / airborne collision avoidance system (ACAS) a suitable combination of discretes should be recorded to determine the status of the system:
36a	Combined control
36b	Vertical control
36c	Up advisory
36d	Down advisory
36e	Sensitivity level
37	Wind shear warning
38	Selected barometric setting
38a	Pilot selected barometric setting
38b	Co-pilot selected barometric setting
39	Selected altitude (all pilot selectable modes of operation) - to be recorded for the aeroplane where the parameter is displayed electronically
40	Selected speed (all pilot selectable modes of operation) - to be recorded for the aeroplane where the parameter is displayed electronically
41	Selected Mach (all pilot selectable modes of operation) - to be recorded for the aeroplane where the parameter is displayed electronically
42	Selected vertical speed (all pilot selectable modes of operation) - to be recorded for the

No*	Parameter
	aeroplane where the parameter is displayed electronically
43	Selected heading (all pilot selectable modes of operation) - to be recorded for the aeroplane where the parameter is displayed electronically
44	Selected flight path (All pilot selectable modes of operation) - to be recorded for the aeroplane where the parameter is displayed electronically
44a	Course/desired track (DSTRK)
44b	Path angle
44c	Coordinates of final approach path (IRNAV/IAN)
45	Selected decision height - to be recorded for the aeroplane where the parameter is displayed electronically
46	Electronic flight instrument system (EFIS) display format:
46a	Pilot
46b	Co-pilot
47	Multi-function/engine/alerts display format
48	Alternating current (AC) electrical bus status - each bus
49	Direct current (DC) electrical bus status - each bus
50	Engine bleed valve position
51	Auxiliary power unit (APU) bleed valve position
52	Computer failure – (all critical flight and engine control system)
53	Engine thrust command
54	Engine thrust target
55	Computed centre of gravity (CG)
56	Fuel quantity or fuel quantity in CG trim tank
57	Head up display in use
58	Para visual display on
59	Operational stall protection, stick shaker and pusher activation
60	Primary navigation system reference:
60a	GNSS
60b	Inertial navigational system (INS)
60c	VHF omnidirectional radio range (VOR) /distance measuring equipment (DME)
60d	MLS
60e	Loran C
60f	ILS
61	Ice detection
62	Engine warning - each engine vibration
63	Engine warning - each engine over temperature
64	Engine warning - each engine oil pressure low
65	Engine warning - each engine over speed
66	Yaw trim surface position
67	Roll trim surface position

No*	Parameter
68	Yaw or sideslip angle
69	De-icing and/or anti-icing systems selection
70	Hydraulic pressure - each system
71	Loss of cabin pressure
72	Flight crew compartment trim control input position pitch - when mechanical means for control inputs are not available, cockpit display trim positions or trim command should be recorded
73	Flight crew compartment trim control input position roll - when mechanical means for control inputs are not available, flight crew compartment display trim positions or trim command should be recorded
74	Flight crew compartment trim control input position yaw - when mechanical means for control inputs are not available, flight crew compartment display trim positions or trim command should be recorded
76	Event marker
77	Date
78	Actual navigation performance (ANP) or estimate of position error (EPE) or estimate of position uncertainty (EPU)

* The number in the left hand column reflects the serial number depicted in EUROCAE Document ED-112.

AMC2 CAT.IDE.A.190 Flight data recorder

OPERATIONAL PERFORMANCE REQUIREMENTS FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL COFA ON OR AFTER 1 APRIL 1998 AND BEFORE 1 JANUARY 2016

(a) The operational performance requirements for FDRs should be those laid down in EUROCAE Document ED-55 (Minimum Operational Performance Requirements For Flight Data Recorder Systems) dated May 1990, or EUROCAE Document ED-112 (Minimum Operational Performance Specification for Crash Protected Airborne Recorder Systems) dated March 2003, including amendments n°1 and n°2, or any later equivalent standard produced by EUROCAE.

(b) The FDR should record, with reference to a timescale:

(1) the parameters listed in Table 1a or Table 1b below, as applicable;

(2) the additional parameters listed in Table 2 below, for those aeroplanes with an MCTOM exceeding 27 000 kg;

(3) any dedicated parameters relating to novel or unique design or operational characteristics of the aeroplane as determined by the competent authority; and

(4) the additional parameters listed in Table 3 below, for those aeroplanes equipped with electronic display systems.

(c) When determined by the Agency, the FDR of aeroplanes first issued with an individual CofA before 20 August 2002 and equipped with an electronic display system does not need to record those parameters listed in Table 3 for which:

(1) the sensor is not available;

(2) the aeroplane system or equipment generating the data needs to be modified; or

(3) the signals are incompatible with the recording system;

(d) The FDR of aeroplanes first issued with an individual CofA on or after 1 April 1998 but not later than 1 April 2001 is not required to comply with (b) above if:

(1) compliance with (a) cannot be achieved without extensive modification to the aeroplane system and equipment other than the flight recording system; and

(2) the FDR of the aeroplane can comply with AMC4 CAT.IDE.A.190(a) except that parameter 15b in Table 1 of AMC4 CAT.IDE.A.190 need not be recorded.

(e) The parameters to be recorded should meet, as far as practicable, the performance specifications (ranges, sampling intervals, accuracy limits, and resolution in read-out) defined in Table 1 of AMC3 CAT.IDE.A.190

(f) For aeroplanes with novel or unique design or operational characteristics, the additional parameters should be those required in accordance with applicable Certification Specifications during type or supplemental certification or validation.

(g) If recording capacity is available, as many as possible of the additional parameters specified in table II-A.1 of EUROCAE Document ED 112 dated March 2003 should be recorded.

Table 1a: FDR – Aeroplanes with an MCTOM of more than 5 700 kg

No	Parameter
1	Time or relative time count
2	Pressure altitude
3	Indicated airspeed or calibrated airspeed
4	Heading
5	Normal acceleration
6	Pitch attitude
7	Roll attitude
8	Manual radio transmission keying
9	Propulsive thrust/power on each engine and flight crew compartment thrust / power lever position if applicable
10	Trailing edge flap or flight crew compartment control selection
11	Leading edge flap or flight crew compartment control selection
12	Thrust reverse status
13	Ground spoiler position and/or speed brake selection
14	Total or outside air temperature
15	Autopilot, autothrottle and AFCS mode and engagement status
16	Longitudinal acceleration (body axis)
17	Lateral acceleration

Table 1b: FDR – Aeroplanes with an MCTOM 5 700 kg or below

No	Parameter
1	Time or relative time count
2	Pressure altitude
3	Indicated airspeed or calibrated airspeed
4	Heading
5	Normal acceleration
6	Pitch attitude
7	Roll attitude
8	Manual radio transmission keying
9	Propulsive thrust/power on each engine and flight crew compartment thrust/power lever position if applicable
10	Trailing edge flap or flight crew compartment control selection
11	Leading edge flap or flight crew compartment control selection
12	Thrust reverse status
13	Ground spoiler position and/or speed brake selection
14	Total or outside air temperature
15	Autopilot/autothrottle engagement status
16	Longitudinal acceleration (body axis)
17	Angle of attack (if a suitable sensor is available)

Table 2: FDR – Additional parameters for aeroplanes with an MCTOM of more than 27 000 kg

No	Parameter
18	Primary flight controls - control surface position and/or pilot input (pitch, roll, yaw)
19	Pitch trim position
20	Radio altitude
21	Vertical beam deviation (ILS glide path or MLS elevation)
22	Horizontal beam deviation (ILS localiser or MLS azimuth)
23	Marker beacon passage
24	Warnings
25	Reserved (navigation receiver frequency selection is recommended)
26	Reserved (DME distance is recommended)
27	Landing gear squat switch status or air/ground status
28	Ground proximity warning system
29	Angle of attack
30	Low pressure warning (hydraulic and pneumatic power)
31	Groundspeed
32	Landing gear or gear selector position

Table 3: FDR – Aeroplanes equipped with electronic display systems

No	Parameter
33	Selected barometric setting (each pilot station)
34	Selected altitude
35	Selected speed
36	Selected Mach
37	Selected vertical speed
38	Selected heading
39	Selected flight path
40	Selected decision height
41	EFIS display format
42	Multi-function / engine / alerts display format

AMC3 CAT.IDE.A.190 Flight data recorder

PERFORMANCE SPECIFICATIONS FOR THE PARAMETERS TO BE RECORDED FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL C OF A ON OR AFTER 1 APRIL 1998 AND BEFORE 1 JANUARY 2016

Table 1: FDR

No	Parameter	Range	Sampling interval in seconds	Accuracy limits (sensor input compared to FDR readout)	Recommended resolution in readout	Remarks
1a or	Time	24 hours	4	± 0.125 % per hour	1 second	(a) UTC time preferred where available.
1b	Relative time count	0 to 4 095	4	± 0.125 % per hour		(b) Counter increments every 4 seconds of system operation.
2	Pressure altitude	-1 000 ft to maximum certificated altitude of aircraft +5 000 ft	1	±100 ft to ±700 ft Refer to Table II-A.3 of EUROCAE Document ED-112	5 ft	Should be obtained from air data computer when installed.
3	Indicated airspeed or calibrated airspeed	50 kt or minimum value installed pitot static system to Max V_{SO} Max V_{SO} to 1•2 V_d	1	±5 % ±3 %	1 kt (0.5 kt recommended)	Should be obtained from air data computer when installed. VSO: stalling speed or minimum steady flight speed in the landing configuration V_D design diving speed
4	Heading	360 degrees	1	±2 degrees	0.5 degrees	
5	Normal acceleration	-3 g to +6 g	0.125	1 % of maximum range excluding a datum error of 5 %	0.004 g	The recording resolution may be rounded from 0.004 g to 0.01 g provided that one sample is recorded at full resolution at least every 4 seconds.
6	Pitch attitude	±75 degrees	0.25	±2 degrees	0.5 degrees	
7	Roll attitude	±180 degrees	0.5	±2 degrees	0.5 degrees	
8	Manual radio transmission keying	Discrete	1	-	-	Preferably each crew member but one discrete acceptable for all transmissions provided that the replay of a recording made by any required recorder can be synchronised in time with any other required recording to within 1 second.
9a	Propulsive thrust / power on each engine	Full range	Each engine each second	±2 %	0.2 % of full range	Sufficient parameters e.g. EPR/N, or Torque/N_P as appropriate to the particular engine must be recorded to determine power in both normal and reverse thrust. A margin for possible overspeed should be provided.

9b	Flight crew compartment thrust / power lever position	Full range	Each lever each second	±2 % or sufficient to determine any gated position	2 % of full range	Parameter 9b must be recorded for aeroplanes with non-mechanically linked cockpit-engine controls, otherwise recommended.
10	Trailing edge flap or flight crew compartment control selection	Full range or each discrete position	2	±3° or as pilot's indicator and sufficient to determine each discrete position	0.5 % of full range	Flap position and cockpit control may be sampled at 4 seconds intervals so as to give a data point each 2 seconds.
11	Leading edge flap or flight crew compartment control selection	Full range or each discrete position	1	±3° or as pilot's indicator and sufficient to determine each discrete position	0.5 % of full range	Left and right sides, or flap position and cockpit control may be sampled at 2 seconds intervals so as to give a data point each second.
12	Thrust reverser status	Turbo-jet: stowed, in transit and reverse Turbo-prop: reverse	Each reverser each second	-	-	Turbo-jet: 2 discretes enable the 3 states to be determined Turbo-prop: 1 discrete
13	Ground spoiler and/or speed brake selection	Full range or each discrete position	0.5	±2º unless higher accuracy uniquely required	0.2 % of full range	Sufficient to determine use of the cockpit selector and the activation and positions of the surfaces
14	Outside air temperatures or total air temperature	-50°C to +90°C or available sensor range	2	±2ºC	0.3ºC	
15	Autopilot / Autothrottle / AFCS mode and engagement status	A suitable combination of discretes	1	-	-	Discretes should show which systems are engaged and which primary modes are controlling the flight path and speed of the aircraft.
16	Longitudinal acceleration (Body axis)	± 1 g	0.25	±1.5 % of maximum range excluding a datum error of ±5 %	0.004 g	The recording resolution may be rounded from 0.004 g to 0.01 g provided that one sample is recorded at full resolution at least every 4 seconds.

17	Lateral acceleration	±1 g	0.25	±1.5 % of maximum range excluding a datum error of ±5 %	0.004 g	The recording resolution may be rounded from 0.004 g to 0.01 g provided that one sample is recorded at full resolution at least every 4 seconds.
18	Primary flight controls, control surface positions and/or* pilot input	Full range	1	±2º unless higher accuracy uniquely required	0.2 % of full range	*For aeroplanes that can demonstrate the capability of deriving either the control input or control movement (one from the other) for all modes of operation and flight regimes, the 'or' applies. For aeroplanes with non-mechanical control systems the 'and' applies. Where the input controls for each pilot can be operated independently, both inputs will need to be recorded. For multiple or split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately.
18a	Pitch axis		0.25			
18b	Roll axis		0.25			
18c	Yaw axis		0.5			
19	Pitch trim position	Full range	1	±3 % unless higher accuracy uniquely required	0.3 % of full range	Where dual surfaces are provided it is permissible to record each surface alternately.
20	Radio altitude	-20 ft to +2 500 ft	1	As installed ±2 ft or ±3 % whichever is greater below 500 ft and ±5 % above 500 ft recommended.	1 ft below 500 ft, 1 ft +0.5 % of full range above 500 ft	For auto-land/category III operations, each radio altimeter should be recorded, but arranged so that at least one is recorded each second.
21	Vertical beam deviation		1	As installed ±3 % recommended	0.3 % of full range	Data from both the ILS and MLS systems need not to be recorded at the same time. The approach aid in use should be recorded. For auto-land/ category III operations, each radio altimeter should be recorded, but arranged so that at least one is recorded each second.
21a	ILS glide path	±0.22 DDM or available sensor range as installed				
21b	MLS elevation	0.9° to 30°				
22	Horizontal beam deviation	Signal range	1	As installed ±3 % recommended	0.3 % of full range	See parameter 21 remarks.
22a	ILS Localiser	±0.22 DDM or available sensor range as installed				
22b	MLS azimuth	±62°				
23	Marker beacon passage	Discrete	1	–	–	A single discrete is acceptable for all markers.

24	Warnings	Discretes	1	–	–	A discrete must be recorded for the master warning. Each 'red' warning (including lavatory smoke) should be recorded when the warning condition cannot be determined from other parameters or from the cockpit voice recorder.
25	Reserved	–	–	–	–	
26	Reserved	–	–	–	–	
27	Landing gear squat switch status	Discrete(s)	1 (0.25 recommended for main gears)	–	–	Discretes should be recorded for the nose and main landing gears.
28	Ground proximity warning system (GPWS)	Discrete	1	–	–	A suitable combination of discretes unless recorder capacity is limited in which case a single discrete for all modes is acceptable.
29	Angle of attack	As installed	0.5	As installed	0.3 % of full range	If left and right sensors are available, each may be recorded at 1 second intervals so as to give a data point each half second.
30	Low pressure warning	Discrete(s) or available sensor range	2	-	0.5 % of full range	Each essential system to be recorded.
30a	Hydraulic power					
30b	Pneumatic power					
31	Groundspeed	As installed	1	Data should be obtained from the most accurate system	1 kt	
32	Landing gear or gear selector position	Discrete(s)	4	-	–	A suitable combination of discretes should be recorded.
33	Selected barometric setting (each pilot station)	As installed	64	As installed	1 mb	Where practicable, a sampling interval of 4 seconds is recommended
33a	Pilot					
33b	Co-pilot					
34	Selected altitude	As installed	1	As installed	100 ft	Where capacity is limited a sampling interval of 64 seconds is permissible

34a	Manual					
34b	Automatic					
35	Selected speed	As installed	1	As installed	1 kt	Where capacity is limited a sampling interval of 64 seconds is permissible
35a	Manual					
35b	Automatic					
36	Selected Mach	As installed	1	As installed	0.01	Where capacity is limited a sampling interval of 64 seconds is permissible
36a	Manual					
36b	Automatic					
37	Selected vertical speed	As installed	1	As installed	100 ft/min	Where capacity is limited a sampling interval of 64 seconds is permissible
37a	Manual					
37b	Automatic					
38	Selected heading	360 degrees	1	As installed	1 degree	Where capacity is limited a sampling interval of 64 seconds is permissible
39	Selected flight path		1	As installed		Where capacity is limited a sampling interval of 64 seconds is permissible
39a	Course/DSTRK	360 degrees				
39b	Path Angle	As installed				
40	Selected decision height	0-500 ft	64	As installed	1 ft	
41	EFIS display format	Discrete(s)	4	–	–	Discretes should show the display system status e.g. off, normal, fail, composite, sector, plan, rose, nav aids, wxr, range, copy.
41a	Pilot					
41b	Co-pilot					
42	Multifunction / Engine / Alerts display format	Discrete(s)	4	–	–	Discretes should show the display system status e.g. off, normal, fail, and the identity of display pages for emergency procedures and checklists. Information in checklists and procedures need not be recorded.

AMC4 CAT.IDE.A.190 Flight data recorder

LIST OF PARAMETERS TO BE RECORDED FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL C OF A ON OR AFTER 1 JUNE 1990 UP TO AND INCLUDING 31 MARCH 1998

(a) The FDR should, with reference to a timescale, record:

(1) the parameters listed in Table 1 below; and

(2) the additional parameters listed in Table 2 below for those aeroplanes with an MCTOM exceeding 27 000 kg.

(b) When determined by the Agency, the FDR of aeroplanes having an MCTOM of 27 000 kg or below does not need to record parameters 14 and 15b of Table 1 below if any of the following conditions are met:

(1) the sensor is not readily available;

(2) sufficient capacity is not available in the flight recorder system; or

(3) a change is required in the equipment that generates the data.

(c) When determined by the Agency, the FDR of aeroplanes having an MCTOM exceeding 27 000 kg does not need to record parameter 15b of Table 1 below, and parameters 23, 24, 25, 26, 27, 28, 29, 30 and 31 of Table 2 below, if any of the following conditions are met:

(1) the sensor is not readily available;

(2) sufficient capacity is not available in the FDR system;

(3) a change is required in the equipment that generates the data; or

(4) for navigational data (NAV frequency selection, DME distance, latitude, longitude, ground speed and drift) the signals are not available in digital form.

(d) When determined by the Agency, the FDR does not need to record individual parameters that can be derived by calculation from the other recorded parameters.

(e) The parameters to be recorded should meet, as far as practicable, the performance specifications (range, sampling intervals, accuracy limits, and resolution in read-out) defined in Table 1 of AMC5 CAT.IDE.A.190.

Table 1: Flight data recorder – Aeroplanes with an MCTOM of more than 5 700 kg

No	Parameter
1	Time or relative time count
2	Pressure altitude
3	Indicated airspeed or calibrated airspeed
4	Heading
5	Normal acceleration
6	Pitch attitude
7	Roll attitude
8	Manual radio transmission keying unless an alternate means to synchronise FDR and CVR recordings is provided

No	Parameter
9	Power on each engine
10	Trailing edge flap or flight crew compartment control selection
11	Leading edge flap or flight crew compartment control selection
12	Thrust reverse position (for turbojet aeroplanes only)
13	Ground spoiler position and/or speed brake selection
14	Outside air temperature or total air temperature
15a	Autopilot engagement status
15b	Autopilot operating modes, autothrottle and AFCS systems engagement status and operating modes.

Table 2: - Flight data recorder - Additional parameters for aeroplanes with an MCTOM of more than 27 000 kg

No	Parameter
16	Longitudinal acceleration
17	Lateral acceleration
18	Primary flight controls - control surface position and/or pilot input (pitch, roll and yaw)
19	Pitch trim position
20	Radio altitude
21	Glide path deviation
22	Localiser deviation
23	Marker beacon passage
24	Master warning
25	NAV 1 and NAV 2 frequency selection
26	DME 1 and DME 2 distance
27	Landing gear squat switch status
28	Ground proximity warning system (GPWS)
29	Angle of attack
30	Hydraulics, each system (low pressure)
31	Navigation data
32	Landing gear or gear selector position

AMC5 CAT.IDE.A.190 Flight data recorder

PERFORMANCE SPECIFICATIONS FOR THE PARAMETERS TO BE RECORDED FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL C OF A UP TO AND INCLUDING 31 MARCH 1998

Table 1: - Flight data recorder

No	Parameter	Range	Sampling interval in seconds	Accuracy limits (sensor input compared to FDR readout)	Recommended resolution in readout	Remarks
1	Time or relative time count	24 hours	4	±0.125 % per hour	1 second	Coordinated universal time (UTC) preferred where available, otherwise elapsed time
2	Pressure altitude	-1 000 ft to maximum certificated altitude of aircraft +5 000 ft	1	±100 ft to ±700 ft	5 ft	For altitude record error see EASA ETSO-C124a
3	Indicated airspeed or calibrated airspeed	50 kt to max V_{SO} Max V_{SO} to 1.2 V_d	1	±5 % ±3 %	1 kt	V_{SO} stalling speed or minimum steady flight speed in the landing configuration V_D design diving speed
4	Heading	360 degrees	1	±2 degrees	0.5 degrees	
5	Normal acceleration	-3 g to +6 g	0.125 ±	±1 % of maximum range excluding a datum error of ±5 %	0.004 g	
6	Pitch attitude	±75 degrees	1	±2 degrees	0.5 degrees	
7	Roll attitude	±180 degrees	1	±2 degrees	0.5 degrees	
8	Manual radio transmission keying	Discrete	1	-	-	On-off (one discrete). An FDR/CVR time synchronisation signal complying with 4.2.1 of EUROCAE ED-55 is considered to be an acceptable alternative means of compliance
9	Power on each engine	Full range	Each engine each second	±2 %	0.2 % of full range	Sufficient parameters e.g. EPR/N, or Torque/N_P as appropriate to the particular engine should be recorded to determine power
10	Trailing edge flap or flight crew compartment control selection	Full range or each discrete position	2	±5 % or as pilot's indicator	0.5 % of full range	

No	Parameter	Range	Sampling interval in seconds	Accuracy limits (sensor input compared to FDR readout)	Recommended resolution in readout	Remarks
11	Leading edge flap or flight crew compartment control selection	Full range or each discrete position	2	-	0.5 % of full range	
12	Thrust reverser position	Stowed, in transit and reverse	Each reverser each second	±2 % unless higher accuracy uniquely required	-	
13	Ground spoiler and/or speed brake selection	Full range or each discrete position	1	±2 degrees	0.2 % of full range	
14	Outside air temperatures or total air temperature	Sensor range	2	-	0.3ºC	
15a 15b	Autopilot engagement status Autopilot operating modes, auto-throttle and AFCS systems engagement status and operating modes	A suitable combination of discretes	1		-	
16	Longitudinal acceleration	± 1 g	0.25	±1.5 % of maximum range excluding a datum error of ±5 %	0.004 g	
17	Lateral acceleration	±1 g	0.25	±1.5 % of maximum range excluding a datum error of ±5 %	0.004 g	
18	Primary flight controls, control surface positions and/or pilot input (pitch, roll, yaw)	Full range	1	±2 degrees unless higher accuracy uniquely required	0.2 % of full range	For aeroplanes with conventional control systems 'or' applies For aeroplanes with non-mechanical control systems 'and' applies For aeroplanes with split surfaces a suitable combination of inputs is acceptable in lieu of recording each surface separately
19	Pitch trim position	Full range	1	±3 % unless higher accuracy uniquely required	0.3 % of full range	
20	Radio altitude	-20 ft to +2 500 ft	1	±2 ft or ±3 % whichever is greater below 500 ft and ±5 % above 500 ft	1 ft below 500 ft, 1 ft +5 % of full range above 500 ft	As installed. Accuracy limits are recommended
21	Glide path deviation	Signal range	1	±3 %	0.3 % of full range	As installed. Accuracy limits are recommended

No	Parameter	Range	Sampling interval in seconds	Accuracy limits (sensor input compared to FDR readout)	Recommended resolution in readout	Remarks
22	Localiser deviation	Signal range	1	±3 %	0.3 % of full range	As installed. Accuracy limits are recommended
23	Marker beacon passage	Discrete	1	–	–	A single discrete is acceptable for all markers
24	Master warning	Discrete	1	–	–	
25	NAV 1 and 2 frequency selection	Full range	4	As installed	–	
26	DME 1 and 2 distance	0-200 NM	4	As installed	–	Recording of latitude and longitude from INS or other navigation system is a preferred alternative
27	Landing gear squat switch status	Discrete	1	–	–	
28	Ground proximity warning system (GPWS)	Discrete	1	–	–	
29	Angle of attack	Full range	0.5	As installed	0.3 % of full range	
30	Hydraulics	Discrete(s)	2	–	–	
31	Navigation data	As installed	1	As installed	–	
32	Landing gear or gear selector position	Discrete	4	As installed	–	

* The number in the left hand column reflects the serial number depicted in EUROCAE Document ED-112.

AMC6 CAT.IDE.A.190 Flight data recorder

LIST OF PARAMETERS TO BE RECORDED FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL C OF A BEFORE 1 JUNE 1990

(a) The FDR should, with reference to a timescale, record:

(1) the parameters listed in Table 1 below;

(2) the additional parameters 6 to 15b of Table 2 below, for aeroplanes with an MCTOM exceeding 5 700 kg but not exceeding 27 000 kg and first issued with an individual CofA on or after 1 January 1989, when the following conditions are met:

(i) sufficient capacity is available on a flight recorder system;

(ii) the sensor is readily available; and

(iii) a change is not required in the equipment that generates the data;

(3) the additional parameters from 6 to 15b of Table 2 below, for aeroplanes with a maximum certificated take-off mass exceeding 27 000 kg that are of a type first type certified after 30 September 1969; and

(4) the additional parameters listed in Table 2 below for aeroplanes with an MCTOM exceeding 27 000 kg and first issued with an individual CofA on or after 1 January 1987, when the following conditions are met:

(i) sufficient capacity is available on a flight recorder system;

(ii) the sensor is readily available; and

(iii) a change is not required in the equipment that generates the data.

(b) When determined by the Agency, the FDR of aeroplanes with an MCTOM exceeding 27 000 kg that are of a type first type certified after 30 September 1969 does not need to record the parameters 13, 14 and 15b in Table 2 below, when any of the following conditions are met:

(1) sufficient capacity is not available on a flight recorder system;

(2) the sensor is not readily available; and

(3) a change is required in the equipment that generates the data.

(c) The parameters to be recorded should meet, as far as practicable, the performance specifications (range, sampling intervals, accuracy limits, and resolution in read-out) defined in Table 1 of AMC5 CAT.IDE.A.190).

(d) When so determined by the Agency, the FDR does not need to record individual parameters that can be derived by calculation from the other recorded parameters.

Table 1: Flight data recorder - aeroplanes with an MCTOM exceeding 5 700 kg

No	Parameter
1	Time or relative time count
2	Pressure altitude
3	Indicated airspeed or calibrated airspeed
4	Heading
5	Normal acceleration

The number in the left hand column reflects the serial number depicted in EUROCAE Document ED-112.

Table 2: Additional parameters for aeroplanes under conditions of AMC6 CAT.IDE.A.190, 1 &2

No	Parameter
6	Pitch attitude
7	Roll attitude
8	Manual radio transmission keying unless an alternate means to synchronise the FDR and CVR recordings is provided
9	Power on each engine
10	Trailing edge flap or flight crew compartment control selection
11	Leading edge flap or flight crew compartment control selection
12	Thrust reverse position (for turbojet aeroplanes only)
13	Ground spoiler position and/or speed brake selection
14	Outside air temperature (OAT) or total air temperature
15a 15b	Autopilot engagement status Autopilot operating modes, autothrottle and AFCS, systems engagement status and operating modes.
16	Longitudinal acceleration
17	Lateral acceleration
18	Primary flight controls – control surface position and/or pilot input (pitch, roll and yaw)
19	Pitch trim position
20	Radio altitude
21	Glide path deviation
22	Localiser deviation
23	Marker beacon passage
24	Master warning
25	NAV 1 and NAV 2 frequency selection
26	DME 1 and DME 2 distance
27	Landing gear squat switch status
28	Ground proximity warning system (GPWS)

No	Parameter
29	Angle of attack
30	Hydraulics, each system (low pressure)
31	Navigation data (latitude, longitude, ground speed and drift angle)
32	Landing gear or gear selector position

* The number in the left hand column reflects the serial number depicted in EUROCAE Document ED-112.

GM1 CAT.IDE.A.190 Flight data recorder

GENERAL

(a) The alleviation of AMC2 CAT.IDE.A.190(d) affects a small number of aeroplanes first issued with an individual C of A on or after 1 April 1998 that were either constructed prior to this date or to a specification in force just prior to this date. These aeroplanes may not comply fully with AMC2 CAT.IDE.A.190(b), but are able to comply with AMC4 CAT.IDE.A.190. In addition, this alleviation applies only if compliance with AMC2 CAT.IDE.A.190(b) would imply significant modifications to the aeroplane with a severe re-certification effort.

(b) Flight data recorder systems installed on board aeroplanes first issued with an individual C of A up to and including 31 March 1998, and for which the recorded parameters do not comply with the performance specifications of Table 1 of AMC5 CAT.IDE.A.190 (i.e. range, sampling intervals, accuracy limits and recommended resolution readout) may be acceptable to the Agency.

(c) The alleviations of AMC4 CAT.IDE.A.190(b) and (c), and AMC6 CAT.IDE.A.190(b), are acceptable only if adding the recording of missing parameters to the existing flight data recorder system would require a major upgrade of the system itself. Account is taken of the following:

(1) The extent of the modification required;

(2) The downtime period; and

(3) Equipment software development.

(d) For the purpose of of AMC4 CAT.IDE.A.190(b) and (c), and AMC6 CAT.IDE.A.190(a) and (b), 'capacity available' refers to the space on both the flight data acquisition unit and the flight data recorder not allocated for recording the required parameters, or the parameters recorded for the purpose of the Flight Data Monitoring programme, as determined by the Agency.

(e) For the purpose of AMC4 CAT.IDE.A.190(b) and (c), and AMC6 CAT.IDE.A.190(a) and (b), a sensor is considered 'readily available' when it is already available or can be easily incorporated.

(f) For aeroplanes first issued with an individual C of A up to and including 31 March 1998, the recording of the following additional parameters may be considered:

(1) Remaining parameters in Table 2 of AMC4 CAT.IDE.A.190 or Table 2 of AMC6 CAT.IDE.A.190 as applicable;

(2) Any dedicated parameter relating to novel or unique design or operational characteristics of the aeroplane;

(3) operational information from electronic display systems, such as EFIS, ECAM or EICAS, with the following order of priority:

(i) parameters selected by the flight crew relating to the desired flight path, e.g. barometric pressure setting, selected altitude, selected airspeed, decision height, and autoflight system engagement and mode indications if not recorded from another source;

(ii) display system selection/status, e.g. SECTOR, PLAN, ROSE, NAV, WXR, COMPOSITE, COPY, etc;

(iii) warning and alerts;

(iv) the identity of displayed pages from emergency procedures and checklists.

(4) retardation information including brake application for use in the investigation of landing overruns or rejected take offs; and

(5) additional engine parameters (EPR, N1, EGT, fuel flow, etc.).

AMC1 CAT.IDE.A.195 Data link recording

GENERAL

(a) As a means of compliance with CAT.IDE.A.195 (a), the recorder on which the data link messages are recorded may be:

(1) the CVR;

(2) the FDR;

(3) a combination recorder when CAT.IDE.A.200 is applicable; or

(4) a dedicated flight recorder. In that case, the operational performance requirements for this recorder should be those laid down in EUROCAE Document ED-112 (Minimum Operational Performance Specification for Crash Protected Airborne Recorder Systems) dated March 2003, including amendments n°1 and n°2, or any later equivalent standard produced by EUROCAE.

(b) As a means of compliance with CAT.IDE.A.195 (a)(2), the operator should enable correlation by providing information that allows an accident investigator to understand what data were provided to the aeroplane and, when the provider identification is contained in the message, by which provider.

(c) The timing information associated with the data link communications messages required to be recorded by CAT.IDE.A.195 (a)(3) should be capable of being determined from the airborne-based recordings. This timing information should include at least the following:

(1) the time each message was generated;

(2) the time any message was available to be displayed by the crew;

(3) the time each message was actually displayed or recalled from a queue; and

(4) the time of each status change.

(d) The message priority should be recorded when it is defined by the protocol of the data link communication message being recorded.

(e) The expression 'taking into account the system architecture', in CAT.IDE.A.195 (a)(3), means that the recording of the specified information may be omitted if the existing source systems involved would require a major upgrade. The following should be considered:

(1) the extent of the modification required;

(2) the down-time period; and

(3) equipment software development.

The intention is that new designs of source systems should include this functionality and support the full recording of the required information.

(f) Data link communications messages that support the applications in Table 1 below should be recorded.

(g) Further details on the recording requirements can be found in the recording requirement matrix in Appendix D.2 of EUROCAE Document ED-93 (Minimum Aviation System Performance Specification for CNS/ATM Recorder Systems, dated November 1998).

Table 1: Applications

Item No	Application Type	Application Description	Required Recording Content
1	Data link initiation	This includes any application used to log on to, or initiate, a data link service. In future air navigation system (FANS)-1/A and air traffic navigation (ATN), these are ATS facilities notification (AFN) and context management (CM), respectively.	C
2	Controller/pilot communication	This includes any application used to exchange requests, clearances, instructions and reports between the flight crew and air traffic controllers. In FANS-1/A and ATN, this includes the controller pilot data link communications (CPDLC) application. It also includes applications used for the exchange of oceanic (OCL) and departure clearances (DCL) as well as data link delivery of taxi clearances.	C
3	Addressed surveillance	This includes any surveillance application in which the ground sets up contracts for delivery of surveillance data. In FANS-1/A and ATN, this includes the automatic dependent surveillance-contract (ADS-C) application.	C, F2

4	Flight information	This includes any application used for delivery of flight information data to specific aeroplanes. This includes for example digital automatic terminal information service (D-ATIS), data link operational terminal information service (D-OTIS), digital weather information services (D-METAR or TWIP), data link flight information service (D-FIS), and Notice to Airmen (electronic NOTAM) delivery.	C
5	Aircraft broadcast surveillance	This includes elementary and enhanced surveillance systems, as well as automatic dependent surveillance-broadcast (ADS-B) output data.	M*, F2
6	Aeronautical operational control (AOC) data	This includes any application transmitting or receiving data used for AOC purposes (in accordance with the ICAO definition of AOC). Such systems may also process AAC messages, but there is no requirement to record AAC messages	M*
7	Graphics	This includes any application receiving graphical data to be used for operational purposes (i.e. excluding applications that are receiving such things as updates to manuals).	M* F1

GM1 CAT.IDE.A.195 Data link recording

DEFINITIONS AND ACRONYMS

(a) The letters and expressions in Table 1 of AMC1 CAT.IDE.A.195 have the following meaning:

C: complete contents recorded

M: information that enables correlation with any associated records stored separately from the aeroplane.

*: Applications that are to be recorded only as far as is practicable, given the architecture of the system.

F1: graphics applications may be considered as AOC messages when they are part of a data link communications application service run on an individual basis by the operator itself in the framework of the operational control.

F2: where parametric data sent by the aeroplane, such as Mode S, is reported within the message, it should be recorded unless data from the same source is recorded on the FDR.

(b) The definitions of the applications type in Table 1 of AMC1 CAT.IDE.A.195 are described in Table 1 below.

Table 1: Definitions of applications type

Item No	Application Type	Messages	Comments
1	CM		CM is an ATN service
2	AFN		AFN is a FANS 1/A service
3	CPDLC		All implemented up and downlink messages to be recorded
4	ADS-C	ADS-C reports	All contract requests and reports recorded
		Position reports	Only used within FANS 1/A. Only used in oceanic and remote areas.
5	ADS-B	Surveillance data	Information that enables correlation with any associated records stored separately from the aeroplane.
6	D-FIS		D-FIS is an ATN service. All implemented up and downlink messages to be recorded
7	TWIP	TWIP messages	Terminal weather information for pilots
8	D-ATIS	ATIS messages	Refer to EUROCAE Document ED-89A dated December 2003. Data Link Application System Document (DLASD) for the 'ATIS' Data Link Service
9	OCL	OCL messages	Refer to EUROCAE Document ED-106A dated March 2004. Data Link Application System Document (DLASD) for 'Oceanic Clearance' Data Link Service
10	DCL	DCL messages	Refer to EUROCAE Document ED-85A dated December 2003. Data Link Application System Document (DLASD) for 'Departure Clearance' Data Link Service
11	Graphics	Weather maps & other graphics	Graphics exchanged in the framework of procedures within the operational control, as specified in Part-ORO. Information that enables correlation with any associated records stored separately from the aeroplane.
12	AOC	Aeronautical operational control messages	Messages exchanged in the framework of procedures within the operational control, as specified in Part-ORO. Information that enables correlation with any associated records stored separately from the aeroplane. Definition in EUROCAE Document ED-112, dated March 2003.
13	Surveillance	Downlinked aircraft parameters (DAP)	As defined in ICAO Annex 10 Volume IV (Surveillance systems and ACAS).

AAC	aeronautical administrative communications
ADS-B	automatic dependent surveillance - broadcast
ADS-C	automatic dependent surveillance – contract
AFN	aircraft flight notification
AOC	aeronautical operational control
ATIS	automatic terminal information service
ATSC	air traffic service communication
CAP	controller access parameters

CPDLC	controller pilot data link communications
CM	configuration/context management
D-ATIS	digital ATIS
D-FIS	data link flight information service
D-METAR	data link meteorological airport report
DCL	departure clearance
FANS	Future Air Navigation System
FLIPCY	flight plan consistency
OCL	oceanic clearance
SAP	system access parameters
TWIP	terminal weather information for pilots

AMC1 CAT.IDE.A.200 Combination recorder

GENERAL

When two flight data and cockpit voice combination recorders are installed, one should be located near the flight crew compartment, in order to minimise the risk of data loss due to a failure of the wiring that gathers data to the recorder. The other should be located at the rear section of the aeroplane, in order to minimise the risk of data loss due to recorder damage in the case of a crash.

GM1 CAT.IDE.A.200 Combination recorder

GENERAL

(a) A flight data and cockpit voice combination recorder is a flight recorder that records:

(1) all voice communications and aural environment required by CAT.IDE.A.185 regarding CVRs; and

(2) all parameters required by CAT.IDE.A.190 regarding FDRs,

with the same specifications required by those paragraphs.

(b) In addition a flight data and cockpit voice combination recorder may record data link communication messages and related information required by CAT.IDE.A.195.

AMC1 CAT.IDE.A.205 Seats, seat safety belts, restraint systems and child restraint devices

CHILD RESTRAINT DEVICES (CRDs)

(a) A CRD is considered to be acceptable if:

(1) it is a 'supplementary loop belt' manufactured with the same techniques and the same materials as the approved safety belts; or

(2) it complies with (b).

(b) Provided the CRD can be installed properly on the respective aircraft seat, the following CRDs are considered acceptable:

(1) CRDs approved for use in aircraft by the competent authority on the basis of a technical standard and marked accordingly;

(2) CRDs approved for use in motor vehicles according to the UN standard ECE R 44, -03 or later series of amendments;

(3) CRDs approved for use in motor vehicles and aircraft according to Canadian CMVSS 213/213.1;

(4) CRDs approved for use in motor vehicles and aircraft according to US FMVSS No 213 and manufactured to these standards on or after February 26, 1985. US approved CRDs manufactured after this date must bear the following labels in red letters:

(i) 'THIS CHILD RESTRAINT SYSTEM CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS'; and

(ii) 'THIS RESTRAINT IS CERTIFIED FOR USE IN MOTOR VEHICLES AND AIRCRAFT';

(5) CRDs qualified for use in aircraft according to the German 'Qualification Procedure for Child Restraint Systems for Use in Aircraft' (TÜV Doc.: TÜV/958-01/2001); and

(6) devices approved for use in cars, manufactured and tested to standards equivalent to those listed above. The device should be marked with an associated qualification sign, which shows the name of the qualification organisation and a specific identification number, related to the associated qualification project. The qualifying organisation should be a competent and independent organisation that is acceptable to the competent authority.

(c) Location

(1) Forward facing CRDs may be installed on both forward and rearward facing passenger seats but only when fitted in the same direction as the passenger seat on which they are positioned. Rearward facing CRDs should only be installed on forward facing passenger seats. A CRD should not be installed within the radius of action of an airbag, unless it is obvious that the airbag is de-activated or it can be demonstrated that there is no negative impact from the airbag.

(2) An infant in a CRD should be located as near to a floor level exit as feasible.

(3) An infant in a CRD should not hinder evacuation for any passenger.

(4) An infant in a CRD should neither be located in the row (where rows are existing) leading to an emergency exit nor located in a row immediately forward or aft of an emergency exit. A window passenger seat is the preferred location. An aisle passenger seat or a cross aisle passenger seat that forms part of the evacuation route to exits is not recommended. Other locations may be acceptable provided the access of neighbour passengers to the nearest aisle is not obstructed by the CRD.

(5) In general, only one CRD per row segment is recommended. More than one CRD per row segment is allowed if the infants are from the same family or

travelling group provided the infants are accompanied by a responsible adult sitting next to them.

(6) A row segment is the fraction of a row separated by two aisles or by one aisle and the aeroplane fuselage.

(d) Installation

(1) CRDs should only be installed on a suitable aeroplane seat with the type of connecting device they are approved or qualified for. E.g., CRDs to be connected by a three point harness only (most rearward facing baby CRDs currently available) should not be attached to an aeroplane seat with a lap belt only; a CRD designed to be attached to a vehicle seat only by means of rigid bar lower anchorages (ISO-FIX or US equivalent), should only be used on aeroplane seats that are equipped with such connecting devices and should not be attached by the aeroplane seat lap belt. The method of connecting should be the one shown in the manufacturer's instructions provided with each CRD.

(2) All safety and installation instructions should be followed carefully by the responsible adult accompanying the infant. Cabin crew should prohibit the use of any inadequately installed CRD or not qualified seat.

(3) If a forward facing CRD with a rigid backrest is to be fastened by a lap belt, the restraint device should be fastened when the backrest of the passenger seat on which it rests is in a reclined position. Thereafter, the backrest is to be positioned upright. This procedure ensures better tightening of the CRD on the aircraft seat if the aircraft seat is reclinable.

(4) The buckle of the adult safety belt must be easily accessible for both opening and closing, and must be in line with the seat belt halves (not canted) after tightening.

(5) Forward facing restraint devices with an integral harness must not be installed such that the adult safety belt is secured over the infant.

(e) Operation

(1) Each CRD should remain secured to a passenger seat during all phases of flight, unless it is properly stowed when not in use.

(2) Where a CRD is adjustable in recline it must be in an upright position for all occasions when passenger restraint devices are required.

AMC2 CAT.IDE.A.205 Seats, seat safety belts, restraint systems and child restraint devices

UPPER TORSO RESTRAINT SYSTEM

An upper torso restraint system having three straps is deemed to be compliant with the requirement for restraint systems with two shoulder straps.

SAFETY BELT

A safety belt with diagonal shoulder strap (three anchorage points) is deemed to be compliant with the requirement for safety belts (two anchorage points).

AMC3 CAT.IDE.A.205 Seats, seat safety belts, restraint systems and child restraint devices

SEATS FOR MINIMUM REQUIRED CABIN CREW

(a) Seats for the minimum required cabin crew members should be located near required floor level emergency exits, except if the emergency evacuation of passengers would be enhanced by seating cabin crew members elsewhere. In this case other locations are acceptable.

(b) Such seats should be forward or rearward facing within 15° of the longitudinal axis of the aeroplane.

AMC1 CAT.IDE.A.220 First-aid kit

CONTENT OF FIRST-AID KITS

(a) First-aid kits should be equipped with appropriate and sufficient medications and instrumentation. However, these kits should be complemented by the operator according to the characteristics of the operation (scope of operation, flight duration, number and demographics of passengers etc.).

(b) The following should be included in the first-aid kit:

(1) Equipment

(i) bandages (assorted sizes);

(ii) burns dressings (unspecified);

(iii) wound dressings (large and small);

(iv) adhesive dressings (assorted sizes);

(v) adhesive tape;

(vi) adhesive wound closures;

(vii) safety pins;

(viii) safety scissors;

(ix) antiseptic wound cleaner;

(x) disposable resuscitation aid;

(xi) disposable gloves;

(xii) tweezers: splinter; and

(xiii) thermometers (non-mercury).

(2) Medications

(i) simple analgesic (may include liquid form);

(ii) antiemetic;

(iii) nasal decongestant;

(iv) gastrointestinal antacid, in the case of aeroplanes carrying more than nine passengers;

(v) anti-diarrhoeal medication, in the case of aeroplanes carrying more than nine passengers; and

(vi) antihistamine.

(3) Other

(i) a list of contents in at least two languages (English and one other). This should include information on the effects and side effects of medications carried;

(ii) first-aid handbook, current edition;

(iii) medical incident report form;

(iv) biohazard disposal bags.

(4) An eye irrigator, whilst not required to be carried in the first-aid kit, should, where possible, be available for use on the ground.

AMC2 CAT.IDE.A.220 First-aid kit

MAINTENANCE OF FIRST-AID KITS

To be kept up to date, first-aid kits should be:

(a) inspected periodically to confirm, to the extent possible, that contents are maintained in the condition necessary for their intended use;

(b) replenished at regular intervals, in accordance with instructions contained on their labels, or as circumstances warrant; and

(c) replenished after use in-flight at the first opportunity where replacement items are available.

AMC1 CAT.IDE.A.225 Emergency medical kit

CONTENT OF EMERGENCY MEDICAL KIT

(a) Emergency medical kits should be equipped with appropriate and sufficient medications and instrumentation. However, these kits should be complemented by the operator according to the characteristics of the operation (scope of operation, flight duration, number and demographics of passengers etc.).

(b) The following should be included in the emergency medical kit:

(1) Equipment

(i) sphygmomanometer – non mercury;

(ii) stethoscope;

(iii) syringes and needles;

(iv) intravenous cannulae (if intravenous fluids are carried in the first-aid kit a sufficient supply of intravenous cannulae should be stored there as well);

(v) oropharyngeal airways (three sizes);

(vi) tourniquet;

(vii) disposable gloves;

(viii) needle disposal box;

(ix) one or more urinary catheter(s), appropriate for either sex, and anaesthetic gel.;

(x) basic delivery kit;

(xi) bag-valve masks (masks two sizes: one for adults, one for children);

(xii) intubation set;

(xiii) aspirator;

(xiv) blood glucose testing equipment; and

(xv) scalpel.

(2) Instructions: the instructions should contain a list of contents (medications in trade names and generic names) in at least two languages (English and one other).This should include information on the effects and side effects of medications carried. There should also be basic instructions for use of the medications in the kit and ACLS cards (summarising and depicting the current algorithm for advanced cardiac life support).

(3) Medications

(i) coronary vasodilator e.g. glyceriltrinitrate-oral;

(ii) antispasmodic

(iii) epinephrine/adrenaline 1:1 000 (if a cardiac monitor is carried);

(iv) adrenocorticoid - injectable;

(v) major analgesic;

(vi) diuretic - injectable;

(vii) antihistamine - oral and injectable;

(viii) sedative/anticonvulsant – injectable, rectal and oral sedative;

(ix) medication for hypoglycaemia (e.g. hypertonic glucose);

(x) antiemetic;

(xi) atropine - injectable;

(xii) bronchial dilator – injectable or inhaled;

(xiii) IV fluids in appropriate quantity e.g. sodiumchloride 0.9 % (minimum 250 ml);

(xiv) acetylsalicylic acid 300 mg - oral and / or injectable;

(xv) antiarrhythmic - if a cardiac monitor is carried;

(xvi) antihypertensive medication;

(xvii) beta-blocker – oral.

* Epinephrine/Adrenaline 1:10 000 can be a dilution of epinephrine 1:1 000

(4) The carriage of an automated external defibrillator should be determined by the operator on the basis of a risk assessment taking into account the particular needs of the operation.

(5) The automated external defibrillator should be carried on the aircraft, though not necessarily in the emergency medical kit.

AMC2 CAT.IDE.A.225 Emergency medical kit

CARRIAGE UNDER SECURITY CONDITIONS

The emergency medical kit should be kept in under secure conditions, either in the flight crew compartment or in another locked compartment.

AMC3 CAT.IDE.A.225 Emergency medical kit

ACCESS TO EMERGENCY MEDICAL KIT

(a) When the actual situation on board so requires, the commander should limit access to the emergency medical kit.

(b) Drugs should be administered by medical doctors, qualified nurses, paramedics or emergency medical technicians.

(c) Medical students, student paramedics, student emergency medical technicians or nurses aids should only administer drugs if no person mentioned in (b) is on board the flight and appropriate advice has been received.

(d) Oral drugs should not be denied in medical emergency situations where no medically qualified persons are on board the flight.

AMC4 CAT.IDE.A.225 Emergency medical kit

MAINTENANCE OF EMERGENCY MEDICAL KIT

To be kept up to date the emergency medical kit should be:

(a) inspected periodically to confirm, to the extent possible, that the contents are maintained in the condition necessary for their intended use;

(b) replenished at regular intervals, in accordance with instructions contained on their labels, or as circumstances warrant; and

(c) replenished after use-in-flight at the first opportunity where replacement items are available.

GM1 CAT.IDE.A.230 First-aid oxygen

GENERAL

(a) First-aid oxygen is intended for those passengers who still need to breath oxygen when the amount of supplemental oxygen required under CAT.IDE.A.235 or CAT.IDE.A.240 has been exhausted.

(b) When calculating the amount of first-aid oxygen, the operator should take into account the fact that, following a cabin depressurisation, supplemental oxygen as

calculated in accordance with Table 1 of CAT.IDE.A.235 and Table 1 of CAT.IDE.A.240 should be sufficient to cope with potential effects of hypoxia for:

(1) all passengers when the cabin altitude is above 15 000 ft;

(2) at least 30 % of the passengers, for any period when, in the event of loss of pressurisation and taking into account the circumstances of the flight, the pressure altitude in the passenger compartment will be between 14 000 ft and 15 000 ft; and

(3) at least 10 % of the passengers for any period in excess of 30 minutes when the pressure altitude in the passenger compartment will be between 10 000 ft and 14 000 ft.

(c) For the above reasons, the amount of first-aid oxygen should be calculated for the part of the flight after cabin depressurisation during which the cabin altitude is between 8 000 ft and 15 000 ft, when supplemental oxygen may no longer be available.

(d) Moreover, following cabin depressurisation an emergency descent should be carried out to the lowest altitude compatible with the safety of the flight. In addition, in these circumstances, the aeroplane should land at the first available aerodrome at the earliest opportunity.

(e) The conditions above may reduce the period of time during which the first-aid oxygen may be required and consequently may limit the amount of first-aid oxygen to be carried on board.

(f) Means may be provided to decrease the flow to not less than 2 litres per minute, STPD, at any altitude.

AMC1 CAT.IDE.A.235 Supplemental oxygen – pressurised aeroplanes

DETERMINATION OF OXYGEN

(a) In the determination of the amount of supplemental oxygen required for the routes to be flown, it is assumed that the aeroplane will descend in accordance with the emergency procedures specified in the operations manual, without exceeding its operating limitations, to a flight altitude that will allow the flight to be completed safely (i.e. flight altitudes ensuring adequate terrain clearance, navigational accuracy, hazardous weather avoidance etc.).

(b) The amount of supplemental oxygen should be determined on the basis of cabin pressure altitude, flight duration and on the assumption that a cabin pressurisation failure will occur at the pressure altitude or point of flight that is most critical from the standpoint of oxygen need.

(c) Following a cabin pressurisation failure, the cabin pressure altitude should be considered to be the same as the aeroplane pressure altitude, unless it can be demonstrated to the competent authority that no probable failure of the cabin or pressurisation system will result in a cabin pressure altitude equal to the aeroplane pressure altitude. Under these circumstances, the demonstrated maximum cabin pressure altitude may be used as a basis for determination of oxygen supply.

AMC2 CAT.IDE.A.235 Supplemental oxygen – pressurised aeroplanes

OXYGEN REQUIREMENTS FOR FLIGHT CREW COMPARTMENT SEAT OCCUPANTS AND CABIN CREW IN ADDITION TO THE REQUIRED MINIMUM NUMBER OF CABIN CREW

(a) For the purpose of supplemental oxygen supply, flight crew compartment seat occupants who are:

(1) supplied with oxygen from the flight crew source of oxygen should be considered as flight crew members; and

(2) not supplied with oxygen by the flight crew source of oxygen should be considered as passengers.

(b) Cabin crew members in addition to the minimum number of cabin crew and additional crew members should be considered as passengers for the purpose of supplemental oxygen supply.

AMC1 CAT.IDE.A.235(e) Supplemental oxygen – pressurised aeroplanes

AEROPLANES NOT CERTIFIED TO FLY ABOVE 25 000 FT

(a) With respect to CAT.IDE.A.235 (e) the maximum altitude up to which an aeroplane can operate without a passenger oxygen system being installed and capable of providing oxygen to each cabin occupant, should be established using an emergency descent profile that takes into account the following conditions:

(1) 17 seconds' time delay for pilot's recognition and reaction, including mask donning, for trouble shooting and configuring the aeroplane for the emergency descent (emergency descent data/charts established by the aeroplane manufacturer and published in the aircraft flight manual (AFM), and/or the AFM should be used to ensure uniform application of the option); and

(2) maximum operational speed (V_{MO}) or the airspeed approved in the AFM for emergency descent, (emergency descent data/charts established by the aeroplane manufacturer and published in the AFM, and/or AFM should be used to ensure uniform application of the option), whichever is the less;

(b) On routes where oxygen is necessary to be carried for 10 % of the passengers for the flight time between 10 000 ft and 13 000 ft, the oxygen should be provided either by:

(1) a plug-in or drop-out oxygen system with sufficient outlets and dispensing units uniformly distributed throughout the cabin so as to provide oxygen to each passenger at his/her own discretion when seated on his/her assigned seat; or

(2) portable bottles, when a cabin crew member is required on board such flight.

GM1 CAT.IDE.A.235(b)(1) Supplemental oxygen – pressurised aeroplanes

QUICK DONNING MASKS

A quick donning mask is a type of mask that:

(a) can be placed on the face from its ready position, properly secured, sealed and supplying oxygen upon demand, with one hand and within 5 seconds and will thereafter remain in position, both hands being free;

(b) can be donned without disturbing eye glasses and without delaying the flight crew member from proceeding with assigned emergency duties;

(c) once donned, does not prevent immediate communication between the flight crew members and other crew members over the aircraft intercommunication system; and

(d) does not inhibit radio communications.

AMC1 CAT.IDE.A.240 Supplemental oxygen - non-pressurised aeroplanes

AMOUNT OF SUPPLEMENTAL OXYGEN

The amount of supplemental oxygen for sustenance for a particular operation should be determined on the basis of flight altitudes and flight duration, consistent with the operating procedures, including emergency procedures, established for each operation and the routes to be flown, as specified in the operations manual.

AMC1 CAT.IDE.A.245 Crew protective breathing equipment

PROTECTIVE BREATHING EQUIPMENT (PBE)

The supply for PBE for the flight crew members may be provided by the supplemental oxygen required in CAT.IDE.A.235 or CAT.IDE.A.240.

AMC1 CAT.IDE.A.250 Hand fire extinguishers

NUMBER, LOCATION AND TYPE

(a) The number and location of hand fire extinguishers should be such as to provide adequate availability for use, account being taken of the number and size of the passenger compartments, the need to minimise the hazard of toxic gas concentrations and the location of lavatories, galleys, etc. These considerations may result in a number of fire extinguishers greater than the minimum required.

(b) There should be at least one hand fire extinguisher installed in the flight crew compartment and this should be suitable for fighting both flammable fluid and electrical equipment fires. Additional hand fire extinguishers may be required for the protection of other compartments accessible to the crew in flight. Dry chemical fire extinguishers should not be used in the flight crew compartment, or in any compartment not separated by a partition from the flight crew compartment, because of the adverse effect on vision during discharge and, if conductive, interference with electrical contacts by the chemical residues.

(c) Where only one hand fire extinguisher is required in the passenger compartments it should be located near the cabin crew member’s station, where provided.

(d) Where two or more hand fire extinguishers are required in the passenger compartments and their location is not otherwise dictated by consideration of CAT.IDE.A.250 (b), an extinguisher should be located near each end of the cabin with the remainder distributed throughout the cabin as evenly as is practicable.

(e) Unless an extinguisher is clearly visible, its location should be indicated by a placard or sign. Appropriate symbols may also be used to supplement such a placard or sign.

AMC1 CAT.IDE.A.255 Crash axe and crowbar

STORAGE OF CRASH AXES AND CROWBARS

Crash axes and crowbars located in the passenger compartment should be stored in a position not visible to passengers.

AMC1 CAT.IDE.A.260 Marking of break-in points

MARKINGS – COLOUR AND CORNERS

(a) The colour of the markings should be red or yellow and, if necessary, should be outlined in white to contrast with the background.

(b) If the corner markings are more than 2 m apart, intermediate lines 9 cm x 3 cm should be inserted so that there is no more than 2 m between adjacent markings.

AMC1 CAT.IDE.A.270 Megaphones

LOCATION OF MEGAPHONES

(a) Where one megaphone is required, it should be readily accessible at the assigned seat of a cabin crew member or crew members other than flight crew.

(b) Where two or more megaphones are required, they should be suitably distributed in the passenger compartment(s) and readily accessible to crew members assigned to direct emergency evacuations.

(c) This does not necessarily require megaphones to be positioned such that they can be physically reached by a crew member when strapped in a cabin crew member's seat.

AMC1 CAT.IDE.A.280 Emergency locator transmitter (ELT)

ELT BATTERIES

Batteries used in the ELTs should be replaced (or recharged, if the battery is rechargeable) when the equipment has been in use for more than 1 cumulative hour, and also when 50 % of their useful life (or for rechargeable, 50 % of their useful life of charge), as established by the equipment manufacturer has expired. The new expiry date for the replacement (or recharged) battery should be legibly marked on the outside of the equipment. The battery useful life (or useful life of charge) requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.

AMC2 CAT.IDE.A.280 Emergency locator transmitter (ELT)

TYPES OF ELT AND GENERAL TECHNICAL SPECIFICATIONS

(a) The ELT required by this provision should be one of the following:

(1) Automatic fixed (ELT(AF)). An automatically activated ELT that is permanently attached to an aeroplane and is designed to aid search and rescue (SAR) teams in locating the crash site.

(2) Automatic portable (ELT(AP)). An automatically activated ELT, that is rigidly attached to an aeroplane before a crash, but is readily removable from the aeroplane after a crash. It functions as an ELT during the crash sequence. If the ELT(AP) does not employ an integral antenna, the aeroplane-mounted antenna may be disconnected and an auxiliary antenna (stored on the ELT case) attached to the ELT. The ELT can be tethered to a survivor or a life-raft. This type of ELT is intended to aid SAR teams in locating the crash site or survivor(s).

(3) Automatic deployable (ELT(AD))an ELT that is rigidly attached to the aeroplane before the crash and that is automatically ejected, deployed and activated by an impact, and, in some cases, also by hydrostatic sensors. Manual deployment is also provided. This type of ELT should float in water and is intended to aid SAR teams in locating the crash site.

(4) Survival ELT (ELT(S)). An ELT that is removable from an aeroplane, stowed so as to facilitate its ready use in an emergency, and manually activated by a survivor. An ELT(S) may be activated manually or automatically (e.g. by water activation). It should be designed either to be tethered to a life-raft or a survivor.

(b) To minimise the possibility of damage in the event of crash impact, the automatic ELT should be rigidly fixed to the aeroplane structure, as far aft as is practicable, with its antenna and connections arranged so as to maximise the probability of the signal being transmitted after a crash.

(c) Any ELT carried should operate in accordance with the relevant provisions of ICAO Annex 10, Volume III communications systems and should be registered with the national agency responsible for initiating search and rescue or other nominated agency.

AMC1 CAT.IDE.A.285 Flight over water

LIFE–RAFTS AND EQUIPMENT FOR MAKING DISTRESS SIGNALS

(a) The following should be readily available with each life-raft:

(1) means for maintaining buoyancy;

(2) a sea anchor:

(3) life-lines and means of attaching one life-raft to another;

(4) paddles for life-rafts with a capacity of six or less;

(5) means of protecting the occupants from the elements;

(6) a water-resistant torch;

(7) signalling equipment to make the pyrotechnic distress signals described in ICAO Annex 2, Rules of the Air;

(8) 100 g of glucose tablets for each four, or fraction of four, persons that the life-raft is designed to carry:

(9) at least 2 litres of drinkable water provided in durable containers or means of making sea water drinkable or a combination of both; and

(10) first-aid equipment.

(b) As far as practicable, items listed in (a) should be contained in a pack.

AMC1 CAT.IDE.A.285(e)(4)&CAT.IDE.A.305(a)(2) Flight over water & Survival equipment

SURVIVAL ELT

An ELT(AP) may be used to replace one required ELT(S) provided that it meets the ELT(S) requirements. A water-activated ELT(S) is not an ELT(AP).

AMC1 CAT.IDE.A.285(a) Flight over water

ACCESSIBILITY OF LIFE-JACKETS

The life-jacket should be accessible from the seat or berth of the person for whose use it is provided, with a safety belt or restraint system fastened.

AMC2 CAT.IDE.A.285(a) Flight over water

ELECTRIC ILLUMINATION OF LIFE-JACKETS

The means of electric illumination should be a survivor locator light as defined in the applicable ETSO issued by the Agency or equivalent.

GM1 CAT.IDE.A.285(a) Flight over water

SEAT CUSHIONS

Seat cushions are not considered to be flotation devices.

AMC1 CAT.IDE.A.305 Survival equipment

ADDITIONAL SURVIVAL EQUIPMENT

(a) The following additional survival equipment should be carried when required:

(1) 2 litres of drinkable water for each 50, or fraction of 50, persons on board provided in durable containers;

(2) one knife;

(3) first-aid equipment; and

(4) one set of air/ground codes;

(b) In addition, when polar conditions are expected, the following should be carried:

(1) a means for melting snow;

(2) one snow shovel and one ice saw;

(3) sleeping bags for use by 1/3 of all persons on board and space blankets for the remainder or space blankets for all passengers on board; and

(4) one arctic/polar suit for each crew member.

(c) If any item of equipment contained in the above list is already carried on board the aeroplane in accordance with another requirement, there is no need for this to be duplicated.

AMC1 CAT.IDE.A.305(b)(2) Survival equipment

APPLICABLE AIRWORTHINESS STANDARD

The applicable airworthiness standard should be CS-25 or equivalent.

GM1 CAT.IDE.A.305 Survival equipment

SIGNALLING EQUIPMENT

The signalling equipment for making distress signals is described in ICAO Annex 2, Rules of the Air.

GM2 CAT.IDE.A.305 Survival equipment

AREAS IN WHICH SEARCH AND RESCUE WOULD BE ESPECIALLY DIFFICULT

The expression 'areas in which search and rescue would be especially difficult' should be interpreted, in this context, as meaning:

(a) areas so designated by the authority responsible for managing search and rescue; or

(b) areas that are largely uninhabited and where:

(1) the authority referred to in (a) has not published any information to confirm whether search and rescue would be or would not be especially difficult; and

(2) the authority referred to in (a) does not, as a matter of policy, designate areas as being especially difficult for search and rescue.

AMC1 CAT.IDE.A.325 Headset

GENERAL

(a) A headset consists of a communication device that includes two earphones to receive and a microphone to transmit audio signals to the aeroplane's communication system. To comply with the minimum performance requirements, the earphones and microphone should match the communication system's characteristics and the flight crew compartment environment. The headset should be sufficiently adjustable to fit the pilot's head. Headset boom microphones should be of the noise cancelling type.

(b) If the intention is to utilise noise cancelling earphones, the operator should ensure that the earphones do not attenuate any aural warnings or sounds necessary for alerting the flight crew on matters related to the safe operation of the aeroplane.

GM1 CAT.IDE.A.325 Headset

GENERAL

The term 'headset' includes any aviation helmet incorporating headphones and microphone worn by a flight crew member.

AMC1 CAT.IDE.A.345 Communication and navigation equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks

TWO INDEPENDENT MEANS OF COMMUNICATION

Whenever two independent means of communication are required, each system should have an independent antenna installation, except where rigidly supported non-wire antennae or other antenna installations of equivalent reliability are used.

AMC2 CAT.IDE.A.345 Communication and navigation equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks

ACCEPTABLE NUMBER AND TYPE OF COMMUNICATION AND NAVIGATION EQUIPMENT

(a) An acceptable number and type of communication and navigation equipment is:

(1) one VHF omnidirectional radio range (VOR) receiving system, one automatic direction finder (ADF) system, one distance measuring equipment (DME), except that an ADF system need not be installed provided that the use of ADF is not required in any phase of the planned flight;

(2) one instrument landing system (ILS) or microwave landing system (MLS) where ILS or MLS is required for approach navigation purposes;

(3) one marker beacon receiving system where a marker beacon is required for approach navigation purposes;

(4) area navigation equipment when area navigation is required for the route being flown (e.g. equipment required by Part-SPA);

(5) an additional DME system on any route, or part thereof, where navigation is based only on DME signals;

(6) an additional VOR receiving system on any route, or part thereof, where navigation is based only on VOR signals; and

(7) an additional ADF system on any route, or part thereof, where navigation is based only on non directional beacon (NDB) signals.

(b) Aeroplanes may be operated without the navigation equipment specified in (6) and (7) provided they are equipped with alternative equipment. The reliability and the accuracy of alternative equipment should allow safe navigation for the intended route.

(c) The operator conducting extended range operations with two-engined aeroplanes (ETOPS) should ensure that the aeroplanes have a communication means capable of communicating with an appropriate ground station at normal and planned contingency altitudes. For ETOPS routes where voice communication facilities are

available, voice communications should be provided. For all ETOPS operations beyond 180 minutes, reliable communication technology, either voice-based or data link, should be installed. Where voice communication facilities are not available and where voice communication is not possible or is of poor quality, communications using alternative systems should be ensured.

(d) To perform IFR operations without an ADF system installed, the operator should consider the following guidelines on equipment carriage, operational procedures and training criteria.

(1) ADF equipment may only be removed from or not installed in an aeroplane intended to be used for IFR operations when it is not essential for navigation, and provided that alternative equipment giving equivalent or enhanced navigation capability is carried. This may be accomplished by the carriage of an additional VOR receiver or a GNSS receiver approved for IFR operations.

(2) For IFR operations without ADF, the operator should ensure that:

(i) route segments that rely solely on ADF for navigation are not flown;

(ii) ADF/NDB procedures are not flown;

(iii) the minimum equipment list (MEL) has been amended to take account of the non-carriage of ADF;

(iv) the operations manual does not refer to any procedures based on NDB signals for the aeroplanes concerned; and

(v) flight planning and dispatch procedures are consistent with the above mentioned criteria.

(3) The removal of ADF should be taken into account by the operator in the initial and recurrent training of flight crew.

(e) VHF communication equipment, ILS localiser and VOR receivers installed on aeroplanes to be operated in IFR should comply with the following FM immunity performance standards:

(1) ICAO Annex 10, Volume I - Radio Navigation Aids, and Volume III, Part II - Voice Communications Systems; and

(2) acceptable equipment standards contained in EUROCAE Minimum Operational Performance Specifications, documents ED-22B for VOR receivers, ED-23B for VHF communication receivers and ED-46B for LOC receivers and the corresponding Radio Technical Commission for Aeronautics (RTCA) documents DO-186, DO-195 and DO-196.

AMC3 CAT.IDE.A.345 Communication and navigation equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks

FAILURE OF A SINGLE UNIT

Required communication and navigation equipment should be installed such that the failure of any single unit required for either communication or navigation purposes, or both, will not result in the failure of another unit required for communications or navigation purposes.

AMC4 CAT.IDE.A.345 Communication and navigation equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks

LONG RANGE COMMUNICATION SYSTEMS

(a) AThe long range communication system should be either a high frequency/HF-system or another two-way communication system if allowed by the relevant airspace procedures.

(b) When using one communication system only, the competent authority may restrict the minimum navigation performance specifications (MNPS) approval to the use of the specific routes.

GM1 CAT.IDE.A.345(c) Communication and navigation equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks

SHORT HAUL OPERATIONS

The term 'short haul operations' is considered operations not crossing the North Atlantic.

GM1 CAT.IDE.A.345 Communication and navigation equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks

APPLICABLE AIRSPACE REQUIREMENTS

For aeroplanes being operated under European air traffic control, the applicable airspace requirements include the Single European Sky legislation.

AMC1 CAT.IDE.A.350 Transponder

SSR TRANSPONDER

(a) The secondary surveillance radar (SSR) transponders of aeroplanes being operated under European air traffic control should comply with any applicable Single European Sky legislation.

(b) If the Single European Sky legislation is not applicable, the SSR transponders should operate in accordance with the relevant provisions of Volume IV of ICAO Annex 10.

AMC1 CAT.IDE.A.355 Electronic navigation data management

ELECTRONIC NAVIGATION DATA PRODUCTS

(a) When the operator of a complex motor-powered aeroplane uses a navigation database that supports an airborne navigation application as a primary means of navigation, the navigation database supplier should hold a Type 2 letter of acceptance (LoA), or equivalent.

(b) If this airborne navigation application is needed for an operation requiring a specific approval in accordance with Annex V (Part-SPA), the operator's procedures should be based upon the Type 2 LoA acceptance process.

GM1 CAT.IDE.A.355 Electronic navigation data management

LETTERS OF ACCEPTANCE AND STANDARDS FOR ELECTRONIC NAVIGATION DATA PRODUCTS

(a) A Type 2 LoA is issued by the Agency in accordance with the Agency's Opinion No 01/2005 on The Acceptance of Navigation Database Suppliers. The definitions of navigation database, navigation database supplier, data application integrator, Type 1 LoA and Type 2 LoA can be found in Opinion No 01/2005.

(b) Equivalent to a Type 2 LoA is the FAA Type 2 LoA, issued in accordance with the Federal Aviation Administration (FAA) Advisory Circular AC 20-153 or AC 20-153A, and the Transport Canada Civil Aviation (TCCA) 'Acknowledgement Letter of an Aeronautical Data Process', which uses the same basis.

(c) EUROCAE ED-76/Radio Technical Commission for Aeronautics (RTCA) DO-200A Standards for Processing Aeronautical Data contains guidance relating to the processes that the supplier may follow.