



Australian Government

Civil Aviation Safety Authority

Part 21 Manual of Standards Instrument 2016 (as amended)

made under regulation 21.010D of the *Civil Aviation Safety Regulations 1998*.

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Part 1 — Preliminary

1.1 Name of instrument

- (1) This instrument is the *Part 21 Manual of Standards Instrument 2016*.
- (2) This instrument may be cited as the *Part 21 Manual of Standards*.

1.10 Definitions

In this instrument:

Australian Sport Rotorcraft Association Gyroplane Specifications (Australia)

means the specifications for gyroplanes published by the Australian Sport Rotorcraft Association and as in force from time to time.

BCAR Part 31 – balloons (Britain) means Part 31 of the British Civil Airworthiness Requirements published by the Civil Aviation Authority of the United Kingdom and as in force from time to time.

BCAR Q – airships (Britain) means Section Q of the British Civil Airworthiness Requirements published by the Civil Aviation Authority of the United Kingdom and as in force from time to time.

BCAR Section S (Britain) means Section S of the British Civil Airworthiness Requirements published by the Civil Aviation Authority of the United Kingdom and as in force from time to time.

BCAR Section T (Britain) means Section T of the British Civil Airworthiness Requirements published by the Civil Aviation Authority of the United Kingdom and as in force from time to time.

BFU-95 (Germany) means the standard for ultralight aircraft published by German Aero Club e. V. as in force from time to time.

CAO 101.54 – balloons (Australia) means Civil Aviation Order 101.54 as in force from time to time.

CS-LSA (EASA) means the Certification Specifications for Light Sport Aeroplanes published by EASA and as in force from time to time.

CS-VLA (EASA) means the Certification Specifications for Very Light Aeroplanes published by EASA and as in force from time to time.

DS 1014E (Canada) means the Design Standards for Advanced Ultra-light Aeroplanes published by the Light Aircraft Manufacturers Association of Canada and as in force from time to time.

EUROCAE means the European Organisation for Civil Aviation Equipment.

FAA AC 21.17-1A – airships (USA) means the advisory circular AC 21.17-1A – Type Certification – Airships published by the Federal Aviation Authority of the United States of America on 25 September 1992 and as in force from time to time.

FAR Part 31 – balloons (USA) means Part 31 of the FARs as in force from time to time.

JAR VLA (Joint Aviation Authorities) means the Joint Aviation Requirements for Very Light Airplanes published by the Joint Aviation Authorities of Europe and as in force from time to time.

LFT-UL (Germany) means the German standard LTF-UL for microlight aircraft issued by Luftfahrt-Bundesamt and as in force from time to time.

PICA 26 (Australia) means the PICA 26 design criteria published by CASA and as in force from time to time.

RTCA means RTCA, Inc.

UL/2 PT2 (Czech Republic) means the design standards for aerodynamically controlled microlight aircraft published by Light Aircraft Association of the Czech Republic and as in force from time to time.

Part 2 — Type certificates and type acceptance certificates

Note This Part and Part heading are reserved for future use.

Part 3 — Provisional type certificates

Note This Part and Part heading are reserved for future use.

Part 4 — Changes to type certificates

Note This Part and Part heading are reserved for future use.

Part 5 — Supplemental type certificates

Note This Part and Part heading are reserved for future use.

Part 6 — Production under type certificates

Note This Part and Part heading are reserved for future use.

Part 7 — Production certificates

Note This Part and Part heading are reserved for future use.

Part 8 — Certificates of airworthiness (except provisional certificates of airworthiness) and special flight permits

8.1 Light sport aircraft — standards for design, performance or continuing airworthiness

- (1) For the definition of *LSA standards* in paragraph 21.172 (b) of CASR, a standard for the design, performance or continuing airworthiness of a class of light sport aircraft mentioned in column 2 of an item of the table to subsection (2) is prescribed for the class of light sport aircraft mentioned in column 3 of the item.
- (2) A standard for the design, performance or continuing airworthiness of a class of light sport aircraft mentioned in column 2 of item 2 of the table is prescribed for the class of light sport aircraft mentioned in column 3 of the item, only if the standard is used for the modification or repair of a light sport aircraft constructed to the standard.

Item	Standard	Class of aircraft
1	BCAR Section S (Britain) CS-VLA (EASA) CS-LSA (EASA) LFT-UL (Germany) UL/2 PT2 (Czech Republic) DS 10141E (Canada)	Fixed wing
2	BFU-95 (Germany) PICA26 (Australia) JAR VLA (Joint Aviation Authorities)	Fixed wing
3	Nil	Gliders
4	BCAR Section T (Britain) Australian Sport Rotorcraft Association Gyroplane Specifications (Australia)	Gyroplanes
5	BCAR Part 31 – balloons (Britain) FAR Part 31 – balloons (USA) CAO 101.54 – balloons (Australia) BCAR Q – airships (Britain) FAA AC 21.17-1A – airships (USA)	Lighter-Than-Air
6	BCAR Section S (Britain) DS 10141E (Canada)	Powered parachutes
7	BCAR Section S (Britain) DS 1014E (Canada)	Weight shift control

Part 9 — Provisional certificates of airworthiness

Note This Part and Part heading are reserved for future use.

Part 10 — Approved design organisations

10.1 Purpose

For subregulation 21.263 (2) of CASR, this Part prescribes requirements that:

- (a) must be contained in the exposition for an approved design organisation; and
- (b) are for the qualifications, knowledge and experience for each position mentioned in paragraph 21.263 (1) (d) of CASR.

Note The positions mentioned in paragraph 21.263 (1) (d) are the accountable manager, head of design, each other managerial position, and each position held by a person who carries out a design activity for an approved design organisation.

10.2 Accountable manager — knowledge requirements

The exposition for the approved design organisation must include the requirement that a person appointed by the organisation as the accountable manager for the organisation understands:

- (a) the responsibilities of the accountable manager for the organisation; and
- (b) the scope of the organisation's approval, including its obligations under its approval certificate; and
- (c) the organisation's structure and high level operational arrangements.

10.3 Head of design — knowledge, qualifications and experience requirements

- (1) The exposition for the approved design organisation must include the requirement that a person appointed by the organisation as the head of design for the organisation:
 - (a) has comprehensive knowledge of the following:
 - (i) the responsibilities of the position of head of design for the organisation;
 - (ii) the civil aviation legislation applicable to the organisation;
 - (iii) the exposition and design assurance system manual for the organisation; and
 - (b) has good working knowledge of the civil aviation legislation applicable to the design activities carried out by the organisation under its approval certificate; and
 - (c) has tertiary qualifications in an engineering discipline at least equivalent to a 4 year bachelor degree in engineering under an Australian accredited or recognised program and relevant to the design activities carried out under the organisation's approval certificate; and
 - (d) has appropriate experience to enable the head of design to ensure that the organisation complies with its exposition and design assurance system manual and CASR in carrying out design activities, including a broad range of management experience working in 1 or more technical disciplines relevant to the design activities carried out by the organisation under its approval certificate;
 - (e) has at least 8 years' experience in an engineering discipline working on increasingly complex engineering projects relevant to the design activities carried out by the organisation under its approval certificate and including either:
 - (i) at least 2 years' experience carrying out design activities the same as, or similar to, the design activities carried out by the organisation, either for an organisation under Subpart 21.J of CASR or as an authorised person; or

- (ii) at least 5 years' experience working in CASA or for the national aviation authority of another Contracting State carrying out activities the same as, or similar to, the design activities carried out by the organisation.
- (2) A person who has held the position of head of design (however described) in a design organisation approved under regulation 30 of CAR 1988 is taken to meet the requirements mentioned in paragraphs (c), (d) and (e).

10.4 Person carrying out design activity — knowledge requirements

The exposition for the approved design organisation must include the following requirements for a person carrying out a design activity for the organisation in accordance with the organisation's approval certificate:

- (a) the person must have comprehensive knowledge of:
 - (i) the responsibilities required of the position; and
 - (ii) the technical subject matter applicable to carrying out the design activity; and
 - (iii) the organisation's exposition and design assurance system manual applying to the design activity; and
- (b) the person must have a good working knowledge of the organisation's exposition and design assurance system manual.

10.5 Person carrying out design activity — qualifications and experience requirements

- (1) The section applies if a person carries out a design activity for an approved design organisation in accordance with the organisation's approval certificate and the design activity is not:
 - (a) approving a defect in an Australian aircraft as permissible unserviceability for the aircraft under regulation 21.007 of CASR; or
 - (b) approving technical data under regulation 21.009 of CASR; or
 - (c) approving a major change in a type design under regulation 21.098 of CASR.
- (2) The exposition for the organisation must require that the person has:
 - (a) tertiary qualifications in an engineering discipline that are:
 - (i) at least equivalent to a 4 year Bachelor of Engineering degree under an Australian accredited or recognised program; and
 - (ii) relevant to the authorisation issued to the person by the organisation as mentioned in paragraph 21.237 (3) (c) of CASR; and
 - (b) at least 6 years' experience in an engineering discipline working on increasingly complex projects relevant to the authorisation issued to the person by the organisation as mentioned in paragraph 21.237 (3) (c) of CASR; and
 - (c) at least 12 months' experience in a civil aviation environment in an engineering discipline relevant to the design activity and to the authorisation issued to the person by the organisation as mentioned in paragraph 21.237 (3) (c) of CASR; and
 - (d) experience carrying out certification processes relevant to the design activity; and
 - (e) experience working with other persons working in other engineering disciplines; and

- (f) a good working knowledge of the civil aviation legislation and standards applicable to the design activity and approved design organisations.
- (3) A person authorised by the organisation as mentioned in paragraph 21.237 (3) (c) of CASR to carry out a design activity under Part 21 of CASR is taken to meet the requirements mentioned in subsection (2), if the person has been authorised to carry out an equivalent design activity, either for an organisation under Subpart 21.J of CASR or as an authorised person.

10.6 Person approving defect that is permissible unserviceability — experience requirements

- (1) This section applies if a person approves a defect in an Australian aircraft that is a permissible unserviceability under regulation 21.007 of CASR for the approved design organisation.
- (2) The exposition for the approved design organisation must require that the person has:
 - (a) at least 8 years' experience in an engineering discipline working on increasingly complex projects and that is relevant to:
 - (i) the person's capacity to approve a defect in an aircraft that is a permissible unserviceability; and
 - (ii) the authorisation issued to the person by the organisation as mentioned in paragraph 21.237 (3) (c) of CASR; and
 - (b) at least 2 years' experience carrying out design activities the same as, or similar to, the design activity mentioned in regulation 21.007 either under Subpart 21.J of CASR or as an authorised person; and
 - (c) experience in carrying out certification processes relevant to issuing approvals under regulation 21.007 of CASR.
- (3) A person authorised by the organisation as mentioned in paragraph 21.237 (3) (c) of CASR to carry out a design activity under regulation 21.007 of CASR is taken to meet the requirements mentioned in subsection (2), if the person has been authorised to carry out an equivalent design activity, either for an organisation under Subpart 21.J of CASR or as an authorised person.

10.7 Person authorised to approve technical data — experience requirements

- (1) The exposition for the approved design organisation must require that a person who approves technical data under regulation 21.009 of CASR for the approved design organisation has:
 - (a) at least 4 years' experience in an engineering discipline that is relevant to approving the technical data and to the authorisation issued to the person by the organisation as mentioned in paragraph 21.237 (3) (c) of CASR; and
 - (b) at least 12 months' experience in a civil aviation environment in an engineering discipline that is relevant to approving technical data and to the authorisation issued to the person by the organisation as mentioned in paragraph 21.237 (3) (a) of CASR; and
 - (c) experience carrying out certification processes relevant to issuing approvals under regulation 21.009 of CASR.
- (2) A person authorised by the organisation as mentioned in paragraph 21.237 (3) (c) of CASR to carry out a design activity under regulation 21.009 of CASR is taken to meet the requirements mentioned in subsection (1), if the person has been authorised

to carry out an equivalent design activity, either for an organisation under Subpart 21.J of CASR or as an authorised person.

10.8 Person approving major change in type design — experience requirements

- (1) The exposition for the approved design organisation must require that a person who approves a major change in a type design under regulation 21.098 of CASR for the organisation has:
 - (a) at least 8 years' experience in an engineering discipline relevant to the person's capacity to approve a major change in type design of an aircraft, aircraft engine or propeller and to the authorisation issued to the person by the organisation as mentioned in paragraph 21.237 (3) (c) of CASR; and
 - (b) at least 2 years' current or previous experience as a person carrying out design activities under Subpart 21.J of CASR and to the authorisation issued to the person by the organisation as mentioned in paragraph 21.237 (3) (c) of CASR; and
 - (c) experience in certification processes relevant to approving a major change in a type design of an aircraft, aircraft engine or propeller.
- (2) A person, who is authorised by the organisation as mentioned in paragraph 21.237 (3) (c) of CASR to carry out a design activity under regulation 21.098 of CASR, is taken to meet the requirements mentioned in subsection (1) if the person has been authorised to carry out an equivalent design activity, either for an organisation under Subpart 21.J of CASR or as an authorised person.

Part 11 — Approval of materials, parts, processes and appliances

Note This Part and Part heading are reserved for future use.

Part 12 — Approval of engines, propellers, materials, parts and appliances

Note This Part and Part heading are reserved for future use.

Part 13 — Australian Technical Standard Order Authorisations

13.1 What this Part is about

- (1) The term ATSO is short for Australian Technical Standard Order.
- (2) Subpart 21.O of CASR sets out requirements that must be met for CASA to issue an ATSO authorisation or a letter of ATSO design approval.
- (3) Paragraph 21.601 (2) (a) of CASR defines an *ATSO* to be a minimum performance standard prescribed by the Part 21 Manual of Standards for specified articles used on civil aircraft. This Part prescribes those minimum performance standards.

13.2 Minimum performance standards

- (1) For the definition of *ATSO* in paragraph 21.601 (2) (a) of CASR, the minimum performance standard mentioned in column 2 of an item of the following table is prescribed for the article used on civil aircraft mentioned in column 1 of the item.

Note 1 The Schedules mentioned in column 2 of the table are Schedules to this Manual of Standards.

Note 2 Transitional provisions apply to an ATSO authorisation or letter of ATSO design approval that was in force at the end of 29 November 2017. See Division 14.13.

Minimum performance standards for specified articles used on civil aircraft

Item	Column 1 Specified article used on civil aircraft	Column 2 Minimum performance standard
1	Life preservers	Schedule 21 ATSO-1C13a — Life preservers
2	Airborne ATC transponder equipment	Schedule 22 ATSO-1C74c — Airborne ATC transponder equipment
3	Air traffic control radar beacon system/mode select (ATCRBS/MODE S) airborne equipment	Schedule 23 ATSO-1C112 — Air traffic control radar beacon system/mode select (ATCRBS/MODE S) airborne equipment
4	Dispatcher's restraint strap	Schedule 24 ATSO-C1001 — Dispatcher's restraint strap
5	Refrigerated cargo unit load container	Schedule 25 ATSO-C1002 — Refrigerated cargo unit load container
6	Helicopter external personnel lifting devices	Schedule 26 ATSO-C1003 — Helicopter external personnel lifting devices

Minimum performance standards for specified articles used on civil aircraft

	Column 1	Column 2
Item	Specified article used on civil aircraft	Minimum performance standard
7	Restraint system automated release device	Schedule 27 ATSO-C1006 — Restraint system automated release device
8	Flight data recorder interface unit	Schedule 28 ATSO-C1007b — Flight data recorder interface unit

- (2) A Schedule mentioned in an item of the table in subsection (1) may be cited as the ATSO number mentioned in the item.

Example Schedule 21 of this Manual of Standards may be cited as ATSO-1C13a.

Part 14 — Transitional

Divisions 14.1 to 14.12 — Transitional provisions for Parts 1 to 12

Note These Divisions are reserved for future use.

Division 14.13 — Transitional provisions for Part 13 (Australian Technical Standard Order Authorisations)

14.130 Amendments and repeals made by the *Civil Aviation Legislation Amendment and Repeal (Australian Technical Standard Orders) Instrument 2017*

- (1) This section applies to an ATSO authorisation or letter of ATSO design approval that was in force at the end of 29 November 2017.
- (2) The ATSO authorisation or letter of ATSO design approval is continued in force according to its terms as if Part 13, as in force on 29 November 2017, had not been amended.

Schedules 1 to 20

Note These Schedules are reserved for future use.

Schedule 21 ATSO-1C13a — Life preservers

(subsection 13.2 (1), table, item 1)

1 Application

This Schedule applies to a life preserver for use on an aircraft that is manufactured by an article manufacturer.

2 Definitions

In this Schedule:

ATSO application means an application under subregulation 21.605 (1) of CASR or a submission under paragraph 21.617 (1) (b) of CASR.

FAA TSO-C13f means TSO-C13f — Life Preservers, as in force from time to time.

FAA TSO-C13g means TSO-C13g — Life Preservers, as in force from time to time.

3 Minimum performance standards

- (1) The life preserver must:
 - (a) be of an inflatable type; and
 - (b) be fitted with a whistle in suitable stowage, unless the life preserver is for an infant; and
 - (c) if an ATSO application for the life preserver is received by CASA after 3 August 2018 — meet the performance standards mentioned in FAA TSO-C13g; and
 - (d) if an ATSO application for the life preserver is received by CASA before 4 August 2018 — meet the performance standards mentioned in subclause (2).
- (2) For paragraph (1) (d), the performance standards are either:
 - (a) the performance standards mentioned in FAA TSO-C13g; or
 - (b) the performance standards mentioned in subclause (3) and FAA TSO-C13f, other than the following:
 - (i) the requirement to furnish the note mentioned in subsection c.(2) of FAA TSO-C13f;
 - (ii) the standard mentioned in section d. (Previously Approved Equipment) of FAA TSO-C13f.
- (3) For paragraph (2) (b), the article manufacturer of a life preserver must give to each person receiving a life preserver for use on an aircraft a note that states the following:

This article meets the minimum performance and quality control standards required by an Australian Technical Standard Order (ATSO). Installation of this article requires separate approval.
- (4) For subclauses (1) and (2), a reference in FAA TSO-C13g to a term mentioned in column 1 of an item of the following table is taken to be a reference to the term mentioned in column 2 of the item.

Reference to terms in FAA TSO-C13g		
Item	Column 1 Reference in FAA TSO-C13g	Column 2 Deemed reference
1	pursuant to Title 14 of the Code of Federal Regulations (14 CFR) § 21.618	under regulation 21.609 of CASR
2	14 CFR § 45.15(b)	paragraph 21.607 (1) (c)
3	TSO number	ATSO number
4	the FAA aircraft certification office (ACO) manager responsible for your facility	CASA
5	14 CFR § 21.603(a)(1)	paragraph 21.605 (2) (a)
6	required by a technical standard order (TSO)	required by an Australian Technical Standard Order (ATSO)
7	TSO approved design	ATSO approved design
8	14 CFR § 21.608	paragraph 21.605 (2) (c)
9	the responsible ACO	CASA
10	the manager of the FAA aircraft certification office (ACO) to which this TSO data is to be submitted	CASA

- (5) For subclause (2), a reference in FAA TSO-C13f to a term mentioned in column 1 of an item of the following table is taken to be a reference to the term mentioned in column 2 of the item.

Reference to terms in FAA TSO-C13f		
Item	Column 1 Reference in FAA TSO-C13f	Column 2 Deemed reference
1	FAR section 21.607(d)	paragraph 21.607 (1) (c) of CASR
2	FAR section 21.605	regulation 21.605 of CASR
3	furnish the Manager, Aircraft Certification Office (ACO), Federal Aviation Administration (FAA), having geographical purview of the manufacturer's facilities,	give CASA
4	the manager of the FAA ACO to which this TSO data is to be submitted, as required by paragraph c., Data Requirements	CASA

Schedule 22 ATSO-1C74c — Airborne ATC transponder equipment

(subsection 13.2 (1), table, item 2)

1 Application

This Schedule applies to airborne ATC transponder equipment manufactured by an article manufacturer.

2 Definitions

In this Schedule:

FAA TSO-C74c means TSO-C74c — Airborne ATC transponder equipment, as in force on 20 February 1973.

3 Minimum performance standards — FAA TSO-C74c

- (1) The airborne ATC transponder equipment must meet the requirements mentioned in the FAA TSO-C74c, other than the requirements mentioned in paragraph (e) (*Previously approved equipment*) of FAA TSO-C74c.
- (2) For subclause (1), a reference in FAA TSO-C74c to a term mentioned in column 1 of an item of the following table is taken to be a reference to the term mentioned in column 2 of the item.

Reference to terms in FAA TSO-C74c		
Item	Column 1 Reference in FAA TSO-C74c	Column 2 Deemed reference
1	RTCA Document No. DO-138 entitled <i>Environmental Conditions and Test Procedures for Airborne Electronic/Electrical Equipment and Instruments</i> , dated June 27, 1968, must be used	RTCA Document No. DO-160D called <i>Environmental Conditions and Test Procedures for Airborne Equipment</i> , or a later version of RTCA Document No. DO-160, as existing from time to time, must be used
2	paragraphs 4.0, 5.0, 6.0, 7.0, and 9.0 of DO-138	sections 4, 6, 7, 8 and 16 of RTCA Document No. DO-160D called <i>Environmental Conditions and Test Procedures for Airborne Equipment</i> , or a later version of RTCA Document No. DO-160, as existing from time to time
3	§37.7	paragraph 21.607 (1) (c) of CASR
4	Appendix B of RTCA Document No. DO-138	Appendix A of RTCA Document No. DO-160D called <i>Environmental Conditions and Test Procedures for Airborne Equipment</i> , or a later version of RTCA Document No. DO-160, as existing from time to time
5	TSO number	ATSO number
6	§37.5	regulation 21.605 of CASR

Reference to terms in FAA TSO-C74c		
Item	Column 1 Reference in FAA TSO-C74c	Column 2 Deemed reference
7	furnish to the Chief, Engineering and Manufacturing Branch, Flight Standards Division (or in case of the Western Region, the Chief, Aircraft Engineering Division), Federal Aviation Administration, in the region in which the manufacturer is located,	give CASA
8	Appendix A of RTCA Document No. DO-138 entitled <i>Environmental Conditions and Test Procedures for Airborne Electric/Electrical Equipment and Instruments</i> , dated June 27, 1968	section 21 of RTCA Document No. DO-160D called <i>Environmental Conditions and Test Procedures for Airborne Equipment</i> , or a later version of RTCA Document No. DO-160, as existing from time to time
9	set forth in RTCA Document No. DO-138 entitled <i>Environmental Conditions and Test Procedures for Airborne Electronic/Electrical Equipment and Instruments</i> , dated June 27, 1968	mentioned in RTCA Document No. DO-160D called <i>Environmental Conditions and Test Procedures for Airborne Equipment</i> , or a later version of RTCA Document No. DO-160, as existing from time to time

Schedule 23 ATSO-1C112 — Air traffic control radar beacon system/mode select (ATCRBS/MODE S) airborne equipment

(subsection 13.2 (1), table, item 3)

1 Application

This Schedule applies to air traffic control radar beacon system/mode select (ATSRBS/MODE S) airborne equipment manufactured by an article manufacturer.

2 Definitions

In this Schedule:

ED-12 means the document called *Software considerations in Airborne Systems and Equipment Certification*, published by EUROCAE, as existing from time to time.

ED-14 means the document called *Environmental Conditions and Test Procedures for Airborne Equipment*, published by EUROCAE, as existing from time to time.

ED-73 means the document called *Minimum Operational Performance Specification for Secondary Surveillance Radar MODE S Transponders*, published by EUROCAE, as existing from time to time.

RTCA/DO-160D means the RTCA Document RTCA/DO-160D called *Environmental Conditions and Test Procedures for Airborne Equipment*, or a later version of RTCA Document No. DO-160, as existing from time to time.

RTCA/DO-160F means the RTCA Document RTCA/DO-160F called *Environmental Conditions and Test Procedures for Airborne Equipment*, or a later version of RTCA Document No. DO-160, as existing from time to time.

RTCA/DO-178C means the RTCA Document RTCA/DO-178C called *Software Considerations in Airborne Systems and Equipment Certification*, as existing from time to time.

RTCA/DO-181 means the RTCA Document RTCA/DO-181 called *Minimum Operational Performance Standards for Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/Mode S) Airborne Equipment*, as existing from time to time.

3 Minimum performance standard — general

- (1) The equipment must meet the requirements mentioned in:
 - (a) section 2 of RTCA/DO-181; or
 - (b) ED-73.
- (2) The equipment must have a design assurance level commensurate with its failure condition classification as “major”.

Note The concept of failure condition classification is described in the appropriate certification specification guidance material. For example, EASA AMC 25.1309.

4 Minimum performance standard — environmental test

The equipment must be tested in accordance with the test conditions mentioned in RTCA/DO-160D or ED-14.

5 Minimum performance standard — fire protection

The material used in the equipment, other than small parts (such as knobs, fasteners, seals, grommets and small electrical parts) that would not contribute significantly to the propagation of a fire, must be self-extinguishing in the event of fire.

6 Minimum performance standard — marking

- (1) The equipment must be permanently and legibly marked with the following:
 - (a) either:
 - (i) the class of the equipment in accordance with RTCA/DO-181 or ED-73; or
 - (ii) if the equipment meets more than 1 class — the class with the more stringent requirements;
 - (b) if the equipment is of a level within the meaning of ED-73 — either:
 - (i) the level of the equipment in accordance with ED-73; or
 - (ii) if the equipment meets more than 1 level — the level with the more stringent requirements;
 - (c) the environmental categories over which the equipment has been designed to operate mentioned in Appendix A of RTCA/DO-160F;
 - (d) if an environmental test procedure is not applicable and the test is not conducted — an “X” in the space in which the category would otherwise be marked.
- (2) Subject to subclause (3), each component of the equipment, including the antenna and receiver-transmitter, must be permanently and legibly marked with:
 - (a) the name of the manufacturer; and
 - (b) “ATSO-1C112”; and
 - (c) the environmental categories over which it is designed to operate.
- (3) Subclause (2) does not apply to a component, other than the antenna and receiver-transmitter, to the extent the shape, size or nature of the component makes it impracticable to mark on the component the information required by subclause (2).

7 Minimum performance standard — technical data

The technical data mentioned in paragraph 21.605 (2) (b) of CASR for an application by an article manufacturer for an authorisation in relation to the equipment must include the following:

- (a) a description of the manufacturer’s operating instructions and equipment limitations in sufficient detail to explain the operational capability of the equipment;
- (b) the installation procedures and limitations for the equipment, including:
 - (i) an explanation of how the limitations will be sufficient to ensure that the transponder will meet the requirements set out in this Schedule; and
 - (ii) a description of any unique aspects of the installation procedures;
- (c) schematic drawings for the installation procedures;
- (d) wiring diagrams for the installation procedures;
- (e) a list of the components of the equipment, including the part number of each component and vendor part number cross-references, if any;
- (f) a component maintenance manual for the equipment that includes:
 - (i) information about the periodic maintenance, calibration and repair of the installed equipment for its continued airworthiness; and
 - (ii) recommended inspection intervals and service life of the installed equipment;
- (g) a material and process specifications list;
- (h) the manufacturer’s ATSO qualification test reports;

- (i) nameplate drawing showing the information to be marked on the equipment in accordance with clause 6 of this Schedule;
- (j) a list of the drawings and processes, including revision level, necessary to define the equipment's design;
- (k) an environmental qualification form for each component of the equipment as mentioned in RTCA/DO-160D or ED-14;
- (l) if the equipment includes a digital computer — a Plan for Software Aspects of Certification mentioned in RTCA/DO-178C.

8 Minimum performance standard — supply of equipment

If the manufacturer of the equipment supplies a unit of the equipment to a person, the manufacturer must give the person the following:

- (a) a copy of the technical data and information mentioned in paragraphs 7 (a) to (e), (i) and (k) of this Schedule;
- (b) a copy of any other data or information necessary for the proper installation, certification, use and continued airworthiness of the equipment;
- (c) for each item of equipment — a document containing the following statement:

The conditions and tests required for ATSO approval of this article are minimum performance standards. It is the responsibility of the person installing this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the ATSO standards. ATSO articles must have separate approval for installation in an aircraft.

Schedule 24 ATSO-C1001 — Dispatcher's restraint strap

(subsection 13.2 (1), table, item 4)

1 Application

This Schedule applies to a dispatcher's restraint strap manufactured by an article manufacturer.

2 Definitions

In this Schedule:

AS/NZS 1891.1:1995 means AS/NZS 1891.1:1995, *Industrial fall-arrest systems and devices, Part 1: Safety belts and harnesses*, as published on 5 March 1995.

dispatcher's restraint strap means an adjustable restraint line that is:

- (a) for use when a door or hatch of an aircraft is open; and
- (b) attached to the aircraft and an occupant of the aircraft when the occupant is not seated with a seat belt or harness fastened; and
- (c) intended to prevent the wearer from falling from the aircraft when carrying out duties at, or near, the door or hatch.

restraint line means a line used to restrict the horizontal movement of the wearer and not designed for either free or restrained fall.

3 Minimum performance standard — general

- (1) Subject to subclauses (2) to (6), the dispatcher's restraint strap must meet the requirements mentioned in AS/NZS 1891.1:1995 relating to restraint lines.
- (2) Despite clause 3.2.4 of AS/NZS 1891.1:1995, the dispatcher's restraint strap may have 1 eyelet for a parachute-type 3 ring quick-release if:
 - (a) the design of the eyelet results in the free edges of the webbing being restrained in the eyelet; and
 - (b) the strap meets the strength requirements mentioned in clause 4.4.2 of AS/NZS 1891.1:1995, tested in accordance with Appendix D of AS/NZS 1891.1:1995, as if it were a separately supplied lanyard.
- (3) The dispatcher's restraint strap does not need to meet the requirements mentioned in clause 4.2.3 of AS/NZS 1891.1:1995 if the strap meets 1 of the following requirements for demonstrating its resistance to degradation by light:
 - (a) a substantiated life limitation;
 - (b) the use of webbing previously qualified to a similar performance standard.
- (4) The instructions mentioned in clause 5.1 of AS/NZS 1891.1:1995 do not need to include the matters mentioned in paragraphs 5.1 (a) to (f) of AS/NZS 1891.1:1995.
- (5) The marking or labelling mentioned in clause 5.2 of AS/NZS 1891.1:1995 does not need to include the information about the maximum allowable free fall mentioned in paragraph 5.2 (d) of AS/NZS 1891.1:1995.
- (6) For the test mentioned in Appendix D of AS/NZS 1891.1:1995:
 - (a) a manually operated hydraulic pump may be used to apply the load; and
 - (b) the specimen may be loaded at a speed other than 150 mm/min.

4 Minimum performance standard — quick-release device

The dispatcher's restraint strap must incorporate a quick-release device that:

- (a) is at the harness end of the strap; and

- (b) is simple and obvious to action; and
- (c) can be easily released under load with 1 hand; and
- (d) is protected against inadvertent release.

5 Minimum performance standard — marking

Instructions for the adjustment of the dispatcher's restraint strap to restrict the occupant from moving any further than the door threshold of the aircraft must be permanently and legibly marked on the webbing of the strap.

6 Minimum performance standard — technical data

The technical data mentioned in paragraph 21.605 (2) (b) of CASR must include the following:

- (a) a complete technical description of the dispatcher's restraint strap, including detail drawings, manufacturing procedures, material identification and specifications;
- (b) a summary of how the design and manufacture of the strap will comply with the requirements of this Schedule;
- (c) conformity inspection reports for the tested components;
- (d) operating instructions and limitations in accordance with AS/NZS 1891.1:1995;
- (e) maintenance instructions in accordance with AS/NZS 1891.1:1995;
- (f) installation instructions and limitations;
- (g) qualification and approval test reports.

7 Minimum performance standard — supply of dispatcher's restraint strap

If the article manufacturer supplies a dispatcher's restraint strap to a person, the manufacturer must give the person the following:

- (a) information requiring the user of the strap to refer to approved data for approved harness types and hard points;
- (b) a document containing the following statement for each strap supplied:

The conditions and tests required for ATSO approval of this article are minimum performance standards. It is the responsibility of those desiring to install the article either on or within a specific type or class of aircraft to determine that the aircraft's installation conditions are within ATSO standards. The article may be installed only if further evaluation by the applicant (user/installer) substantiates an acceptable installation and the installation is approved by CASA.

Schedule 25 ATSO-C1002 — Refrigerated cargo unit load container

(subsection 13.2 (1), table, item 5)

1 Application

This Schedule applies to a refrigerated cargo unit load container that:

- (a) is for carriage as main cabin (upper deck) cargo in transport category aeroplanes; and
- (b) will be connected to the aeroplane's electrical system; and
- (c) is manufactured by an article manufacturer.

2 Definitions

In this Schedule:

NAS 3610 means the document called the National Aerospace Standard (NAS) 3610, *Cargo Unit Load Devices – Specification for*, published by the Aerospace Industries Association of America, Inc., as existing from time to time.

RTCA/DO-160D means the RTCA Document RTCA/DO-160D, *Environmental Conditions and Test Procedures for Airborne Equipment*, as existing from time to time, or a later version of RTCA Document RTCA/DO-160, as existing from time to time.

RTCA/DO-178B means the RTCA Document RTCA/DO-178B, *Software Considerations in Airborne Systems and Equipment Certification*, as existing from time to time.

RTCA/DO-178C means the RTCA Document RTCA/DO-178C, *Software Considerations in Airborne Systems and Equipment Certification*, as existing from time to time.

RTCA/DO-254 means RTCA Document RTCA/DO-254, *Design Assurance Guidance for Airborne Electronic Hardware*, as existing from time to time.

Technical Instructions has the meaning as defined in regulation 92.010 of CASR.

ULD Technical Manual 13th means the *ULD Technical Manual 13th*, published by the International Air Transport Association, as existing from time to time.

3 Minimum performance standard — general

- (1) The refrigerated cargo unit load container must meet the requirements mentioned in the following:
 - (a) NAS 3610;
 - (b) AS/NZS 1677.2:1998, *Refrigerating systems, Part 2: Safety requirements for fixed applications* (Category 2 Occupancy Classification), as existing from time to time;
 - (c) SAE ARP 1308, *Preferred Electrical Connectors for Aerospace Vehicles and Associated Equipment*, as existing from time to time;
 - (d) SAE ARP 1199, *Selection, Application, and Inspection of Electric Overcurrent Protective Devices*, as existing from time to time;
 - (e) SAE ARP 1870, *Aerospace Systems Electrical Bonding and Grounding For Electromagnetic Compatibility and Safety*, as existing from time to time.
- (2) The container must meet the requirements mentioned in the following sections of the *ULD Technical Manual 13th*:
 - (a) Standard Specification 50/4 – Certified Aircraft Container;

- (b) Standard Specification 80/1 – Requirements for Thermal Containers:
 - (i) 4.7 Spillage; and
 - (ii) 4.8 Pressurization; and
 - (iii) 8 Markings;
- (c) Standard Specification 80/2 – Pressure Equalization Requirements for Aircraft and Shipping Containers.

4 Minimum performance standard — environmental test

The refrigerated cargo unit load container must meet be tested in accordance with the test conditions mentioned in RTCA/DO-160D.

5 Minimum performance standard — software

If the refrigerated cargo unit load container includes a digital computer, the software for the computer must be developed in accordance with RTCA/DO-178B, RTCA/DO-178C or RTCA/DO-254.

6 Minimum performance standard — refrigeration unit

- (1) The refrigerant for the refrigerated cargo unit load container must:
 - (a) meet the requirements for refrigerants mentioned in clause 5.9 of Standard Specification 80/1 – Requirements for Thermal Containers of the *ULD Technical Manual 13th*, which requires refrigerants to meet the ICAO Dangerous Goods Regulations; and
 - (b) be of a type acceptable to CASA.
- (2) The refrigeration unit of the refrigerated cargo unit load container must be shown not to create a hazard when subjected to the combined loads mentioned in NAS 3610 and the following self-inertia loads:
 - (a) up 3.0g;
 - (b) forward 9.0g;
 - (c) side 3.0g;
 - (d) down 6.0g.

7 Minimum performance standard — fire protection

- (1) All materials used, except small parts (such as knobs, fasteners, seals, grommets and small electrical parts) that would not contribute significantly to the propagation of a fire, must comply with the applicable requirements of § 25.853 and Part 25, Appendix F of the FARs, as in force from time to time.
- (2) The design of the refrigerated cargo unit load container must include provisions for the following:
 - (a) an overheat protection system for the refrigerator compressor unit;
 - (b) overheat protection for all electric motors;
 - (c) a method of ensuring that the discharge air from the refrigeration unit, during its normal operation, will not activate any fire detection system installed in the aeroplane cabin.

8 Minimum performance standard — dangerous goods

- (1) The refrigeration unit for the refrigerated cargo unit load container must not be excluded from being subject to the Technical Instructions because of Special Provision A26 in Part 3, Chapter 3 of the Technical Instructions.
- (2) Lubricating oils used in the container must not be a flammable liquid within the meaning of Part 2, Chapter 3 of the Technical Instructions.

9 Minimum performance standard — marking

- (1) The refrigerated cargo unit load container must be permanently and legibly marked in accordance with section 8 of the *ULD Technical Manual 13th*.
- (2) The container must be permanently and legibly marked with:
 - (a) the environmental categories over which the equipment has been designated to operate in accordance with RTCA/DO-160D; and
 - (b) if an environment category is not applicable and a test is not conducted — an “X” in the space in which that category would otherwise be marked.

10 Minimum performance standard — technical data

The technical data mentioned in paragraph 21.605 (2) (b) of CASR for a refrigerated cargo unit load container must include the following:

- (a) a complete technical description of the container, including detail drawings, manufacturing procedures, material identification and specifications;
- (b) the manufacturer’s analysis or test results and the results of the environmental qualification tests conducted in accordance with RTCA/DO-160D;
- (c) the conformity inspection reports for the tested components;
- (d) the manufacturer’s operating instructions and limitations;
- (e) the manufacturer’s instructions for maintenance and repair of the container;
- (f) the manufacturer’s instructions for installation and servicing of the container together with any limitations;
- (g) the appropriate documentation in relation to the container mentioned in RTCA/DO-178B, RTCA/DO-178C or RTCA/DO-254;
- (h) if the container includes a digital computer — a Plan for Software Aspects of Certification or a Plan for Hardware Aspects of Certification mentioned in RTCA/DO-178B, RTCA/DO-178C or RTCA/DO-254.

11 Minimum performance standard — supply of container

If the article manufacturer for the refrigerated cargo unit load container supplies a container to a person, the manufacturer must give the person the following:

- (a) the manufacturer’s operating instructions and limitations;
- (b) the manufacturer’s instructions for maintenance and repair of the container;
- (c) the manufacturer’s instructions for installation and servicing the container and any limitations;
- (d) for each container — a copy of a document containing the following statement:
The conditions and tests required for ATSO approval of this article are minimum performance standards. It is the responsibility of those proposing to install the container on or within a specific type or class of aeroplane to determine that the aeroplane’s installation conditions are within ATSO standards. The container

may be installed only if further evaluation by the applicant (user/installer) substantiates an acceptable installation and is approved by CASA.

Schedule 26 ATSO-C1003 – Helicopter external personnel lifting devices

(subsection 13.2 (1), table, item 6)

1 Application

This Schedule applies to a helicopter external personnel lifting device manufactured by an article manufacturer that is 1 of the following kinds of helicopter external personnel lifting device:

- (a) a winchman's or rescue harness;
- (b) a rescue or retrieval strop combination.

2 Definitions

In this Schedule:

AS/NZS 1891.1:1995 Amdt 4 means AS/NZS 1891.1:1995, *Industrial fall-arrest systems and devices, Part 1: Safety belts and harnesses*, incorporating amendments to Amendment No. 4, published on 5 August 1999.

dispatcher's restraint strap has the meaning as defined in Schedule 24.

rescue or retrieval strop combination means an item of equipment that:

- (a) is used in either a single or double lift; and
- (b) is fitted around a person under the person's arms, across the person's back and securing in front of the person's chest.

winchman's or rescue harness means either:

- (a) a full harness that:
 - (i) is worn by a person when suspended outside a helicopter from a winch hook; and
 - (ii) may be used in conjunction with a dispatcher's restraint strap to prevent the wearer from inadvertently exiting the aircraft; or
- (b) a rappel harness.

3 Minimum performance standards — device

- (1) Subject to subclauses (3) to (6), if the helicopter external personnel lifting device is a winchman's or rescue harness, it must meet the requirements mentioned in AS/NZS 1891.1:1995 Amdt 4 for a fall-arrest harness.
- (2) Subject to subclauses (3) to (6), if the helicopter external personnel lifting device is a rescue or retrieval strop combination, it must meet the requirements mentioned in AS/NZS 1891.1:1995 Amdt 4 for a retrieval strap.
- (3) The helicopter external personnel lifting device does not need to meet the requirements mentioned in clause 4.2.3 of AS/NZS 1891.1:1995 Amdt 4 if the device meets 1 of the following requirements for demonstrating its resistance to degradation by light:
 - (a) a substantiated life limitation;
 - (b) the use of webbing previously qualified to a similar performance standard.
- (4) The instructions mentioned in clause 5.1 of AS/NZS 1891.1:1995 Amdt 4 do not need to include the matters mentioned in paragraphs 5.1 (a) to (f) of AS/NZS 1891.1:1995 Amdt 4.

- (5) The marking or labelling mentioned in clause 5.2 of AS/NZS 1891.1:1995 Amdt 4 does not need to include the information about the maximum allowable free fall mentioned in paragraph 5.2 (d) of AS/NZS 1891.1:1995 Amdt 4.
- (6) For the test mentioned in paragraph D5(b) of Appendix D of AS/NZS 1891.1:1995 Amdt 4:
 - (a) a manually operated hydraulic pump may be used to apply the load; and
 - (b) the testing machine may be set at an unladen crosshead speed other than 150 ±20 mm/min.
- (7) If the helicopter external personnel lifting device incorporates a quick-release device when attached to the winch hook, the quick-release device must:
 - (a) be simple and obvious to action; and
 - (b) be able to easily release under load with 1 hand; and
 - (c) be protected against inadvertent release; and
 - (d) only be able to be released by using 2 distinct and separate physical actions to initiate release of the load from the winch hook.
- (8) The helicopter external personnel lifting device must comply with the requirements mentioned in § 29.865 of the FARs, headed *External loads*.
- (9) The helicopter external personnel lifting device must be designed to minimise the possibility of unintentional disengagement during all modes of operation.

4 Minimum performance standard — technical data

The technical data mentioned in paragraph 21.605 (2) (b) of CASR must include the following:

- (a) a complete technical description of the helicopter external personnel lifting device, including detail drawings, manufacturing procedures, material identification and specifications;
- (b) an explanation of how the device meets the minimum performance standards for the device mentioned in clause 3 of this Schedule;
- (c) conformity inspection reports for the tested components of the device;
- (d) the operating instructions and limitations for the device, including any quick-release device;
- (e) maintenance instructions for the device, including the following:
 - (i) procedures to address issues, including cleaning off contaminants that are unique to the operating environment for the device (such as salt water, hydraulic and engine oil);
 - (ii) retirement criteria for the device based on the component condition;
 - (iii) a schedule of periodic inspections to ensure the continued safety of the device throughout its operational life;
- (f) the installation instructions and limitations for the device;
- (g) qualification and approval test reports in relation to the compliance of the device with the applicable functional performance standards mentioned in this Schedule;
- (h) the functional test specifications to be used to test each device to ensure its compliance with this Schedule.

5 Minimum performance standard — supply of device

If the article manufacturer supplies 1 or more helicopter external personnel lifting devices to a person, the manufacturer must give the person the following documents and information:

- (a) the installation instructions and limitations for the device;
- (b) the operating instructions and limitations for the device, including any quick-release device;
- (c) maintenance instructions for the device, including the following:
 - (i) procedures to address issues, including cleaning off contaminants that are unique to the operating environment for the device (such as salt water, hydraulic and engine oil);
 - (ii) retirement criteria for the device based on the component condition;
 - (iii) a schedule of periodic inspections to ensure the continued safety of the device throughout its operational life;
- (d) for each device — a document containing the following statement:

The conditions and tests required for ATSO approval of this article are minimum performance standards. It is the responsibility of those desiring to install the article either on or within a specific type or class of aircraft to determine that the aircraft's installation conditions are within ATSO standards. The article may be installed only if further evaluation by the applicant (user/installer) substantiates an acceptable installation and the installation is approved by CASA.

Schedule 27 ATSO-C1006 — Restraint system automated release device

(subsection 13.2 (1), table, item 7)

1 Application

This Schedule applies to an article manufacturer in relation to a restraint system automated release device.

2 Definitions

In this Schedule:

restraint means a tether, strop, cargo tie-down, seat belt or similar device, which includes its own manual release system.

restraint system automated release device or **RSARD** means a device that:

- (a) is an add-on dual-purpose restraint-release device used in conjunction with a restraint and an anchor point in an aircraft; and
- (b) keeps a person or an item restrained inside the aircraft during flight; and
- (c) automatically activates to release the person or restrained item from the anchor point if the aircraft ditches or crashes into water; and
- (d) is not aircraft type specific.

RTCA/DO-160G means the RTCA Document RTCA/DO-160G called *Environmental Conditions and Test Procedures for Airborne Equipment*, or a later version of RTCA Document No. DO-160, as existing from time to time.

3 Minimum performance standard — compliance with RTCA/DO-160G

The RSARD must comply with the standards in the provision of RTCA/DO-160G mentioned in column 2 of an item of the following table in relation to the environmental conditions mentioned in column 1 of the item.

Compliance with RTCA/DO-160G		
Item	Column 1 Environmental conditions	Column 2 Provision of RTCA/DO-160G
1	Temperature and altitude	Section 4, Category A2
2	Temperature variation	Section 5, Category B
3	Humidity	Section 6, Category B
4	Operational shocks and crash safety	Section 7, Category A
5	Vibration	Section 8, Category U, fuselage zone, unknown helicopter frequency
6	Waterproofness	Section 10, Category W
7	Sand and dust	Section 12, Category S
8	Salt fog	Section 14, Category T
9	Radio frequency susceptibility	Section 20, Category R modified with an upper frequency limit of 12 GHz
10	Fire, flammability	Section 26, Category C

4 Minimum performance standard — RSARD in restraint mode

- (1) The RSARD must, in restraint mode:
 - (a) be statically tested to its ultimate rated strength; and
 - (b) for the load rating test — be attached to an anchor point and restraint, using a method that replicates that likely to be found in service; and
 - (c) if the RSARD is designed to attach to occupant restraints:
 - (i) have a load rating of at least 15 kN; and
 - (ii) be designed to interface with the restraint without modification of the restraint or RSARD; and
 - (d) not interfere with, or modify, the attaching restraint system's normal attaching method or restraint function; and
 - (e) be designed so as to protect against unintentional disengagement; and
 - (f) not restrict the attaching restraint system's range of movement.
- (2) If the RSARD can be easily removed from an anchor point with 1 hand, the release mechanism of the RSARD must be designed to release with 2 independent actions.
- (3) If the RSARD will be attached to a restraint, the RSARD must be designed to avoid dynamic rollout.

5 Minimum performance standard — RSARD in release mode

- (1) The RSARD must, in release mode:
 - (a) release independently and without any further operator action required; and
 - (b) not interfere with, or modify, the attaching restraint system's normal manual release method; and
 - (c) if the RSARD is designed to release only in salt water — be demonstrated to trigger the release in potassium chloride/water solutions down to a minimum water salinity of 31.0 parts per thousand; and
 - (d) have defences against inadvertent activation by salt spray, rain or fluid spillage; and
 - (e) release between 1.5 seconds and 5.5 seconds after it is immersed in water; and
 - (f) be demonstrated to:
 - (i) activate in water temperatures from 1° to 30° Celsius; and
 - (ii) not have its activation time delayed by contact with water at low temperatures; and
 - (iii) not be otherwise affected by contact with water at low temperatures.
- (2) On release, any component of the RSARD that may remain attached to the restraint it is releasing must be of a profile that is not prone to snagging.
- (3) Once released, the RSARD must not be capable of being refitted and made ready for immediate reuse.

6 Minimum performance standard — electrical circuitry

Any electrical circuitry for the RSARD must be capable of self-diagnosing internal faults and clearly indicating to the end user the presence of the faults.

7 Minimum performance standard — marking

The RSARD must:

- (a) be marked with its rated strength; and

(b) if it is designed only to release in salt water — be marked accordingly.

8 Minimum performance standard — technical data

The technical data mentioned in paragraph 21.605 (2) (b) of CASR must include the following:

- (a) a complete technical description of the RSARD, including detail drawings, manufacturing procedures, material identification and specifications;
- (b) operating instructions and limitations for the RSARD;
- (c) a completed compliance summary in relation to the applicable performance standards mentioned in this Schedule;
- (d) conformity inspection reports for the tested components;
- (e) a component maintenance manual containing information about the periodic maintenance, calibration and repair for the continued airworthiness of the RSARD, including recommended inspection intervals and service life for the RSARD;
- (f) qualification and approval test reports in relation to the compliance of the RSARD with the applicable functional performance standards mentioned in this Schedule.

9 Minimum performance standard — supply of RSARD

If the manufacturer for the RSARD supplies 1 or more RSARDs to a person, the manufacturer must give the person the operating instructions and limitations and the component maintenance manual for the RSARD.

Schedule 28 ATSO-C1007b — flight data recorder interface unit

(subsection 13.2 (1), table, item 8)

1 Application

This Schedule applies to an article manufacturer in relation to a flight data recorder interface unit that will be mounted on an airframe of an aircraft and function as the interface between analogue aircraft systems and digital flight recorders.

2 Definitions

In this Schedule:

ARINC 717-15 means the Aeronautical Radio Inc. ARINC Characteristic 717-15 *Flight Data Acquisition and Recording System*, as existing from time to time.

FDRIU means flight data recorder interface unit.

RTCA/DO-160F means RTCA Document RTCA/DO-160F called *Environmental Conditions and Test Procedures for Airborne Equipment*, or a later version of RTCA Document DO-160, as existing from time to time.

RTCA/DO-178C means RTCA Document RTCA/DO-178C called *Software Considerations in Airborne Systems and Equipment Certification*, as existing from time to time.

RTCA/DO-254 means RTCA Document RTCA/DO-254 called *Design Assurance Guidance for Airborne Electronic Hardware*, as existing from time to time.

3 Minimum performance standard — system requirements

- (1) An FDRIU must process the parameters mentioned in column 1 of items 1 to 6 of the following table.
- (2) An FDRIU may also process the parameters mentioned in column 1 of items 7 to 20 of the table.
- (3) Each parameter that is processed by the FDRIU must meet the following requirements:
 - (a) the range over which the parameter is to be recorded mentioned in column 2 of the table;
 - (b) the accuracy of recording for the parameter mentioned in column 3 of the table;
 - (c) the maximum interval in seconds between recorded readings of the parameter mentioned in column 4 of the table.

FDRIU — parameters, ranges, accuracy and recording intervals

Item	Column 1 Parameter	Column 2 Range	Column 3 Accuracy (minimum recorder and readout)	Column 4 Maximum recording intervals (seconds)
1	Time	See Note	±0.125% per hour	60
2	Altitude	-1 000 ft to maximum certificated altitude of aircraft	± 100 to ± 700 ft	1
3	Airspeed	100 kn IAS to the greater of: (a) 450 kn IAS; or (b) 1.0V _D	±10 kn at room temperature ±12 kn at low temperature	1
4	Vertical acceleration	-3g to +6g	±0.2g stabilised ±10% transient	0.125
5	Heading	360°	±2°	1
6	Press to transmit for each transceiver	On/Off	—	1
7	Pitch attitude	±75°	±2°	1
8	Roll attitude	±180°	±2°	1
9	Thrust of each engine	Full range	±2%	4
10	Flap position	Full range	±3°	2
11	Longitudinal acceleration	±1.0g	+0.02g	0.5
12	Undercarriage squat or tilt switch	On/Off	—	0.5
13	Thrust reverser stowed/deployed (each engine)	On/Off	—	4
14	Leading edge devices stowed/deployed	On/Off	—	2
15	Angle of attack (if sensor fitted)	-20° to +40°	±1°	0.5
16	Lateral acceleration	±1.0g	±0.05g stabilised ±10% transient	0.25
17	Pitch trim	Full range	The greater of ±1° or ±5%	2

FDRIU — parameters, ranges, accuracy and recording intervals

Item	Column 1 Parameter	Column 2 Range	Column 3 Accuracy (minimum recorder and readout)	Column 4 Maximum recording intervals (seconds)
18	Control column or pitch control surface position	Full range	$\pm 2^\circ$	1
19	Control wheel or roll control surface position	Full range	$\pm 2^\circ$	1
20	Rudder pedal or yaw control surface position	Full range	$\pm 2^\circ$	0.5

Note Sufficient time data is required to permit determination of the relationship between recorded information and Universal Coordinated Time.

4 Minimum performance standard — signal characteristic

All parameters of the FDRIU must be sampled, conditioned, and digitised or reformatted in such a manner as to meet ARINC 717-15 standard signal characteristic.

5 Minimum performance standard — failure condition classification minor

The FDRIU must have a design assurance level commensurate with the failure condition classification of “minor”.

Note The concept of failure condition classification is described in the appropriate certification specification guidance material. For example, EASA AMC 25.1309.

6 Minimum performance standard — environmental test

The FDRIU must be tested in accordance with the test conditions mentioned in RTCA/DO-160F.

7 Minimum performance standard — software

Software for the FDRIU must be developed in accordance with RTCA/DO-178C to Level D as defined in section 2.3.3 of RTCA/DO-178C.

8 Minimum performance standard — electronic hardware qualification

The electronic hardware for the FDRIU that is complex as described in section 1.6 of RTCA/DO-254 must be developed in accordance with RTCA/DO-254 to Level D as defined in Table 2-1 of RTCA/DO-254.

9 Minimum performance standard — fire protection

The materials used in the manufacture of the FDRIU, other than small parts that would not contribute significantly to the propagation of fire, must be self-extinguishing in the event of fire and meet the requirements of Category C of section 26 of RTCA/DO-160F.

10 Minimum performance standard — marking

- (1) Subject to subclause (2), each component of the FDRIU must be permanently and legibly marked with the name of the manufacturer and the number “ATSO-C1007b”.
- (2) Subclause (1) does not apply to a component to the extent that the shape, size or nature of the component makes it impracticable to mark on the component the information required by subclause (1).

11 Minimum performance standard — supply of unit

If the article manufacturer of the FDRIU supplies 1 or more FDRIUs to a person, the manufacturer must give the person:

- (a) at least 1 copy of the technical data mentioned in paragraphs 12 (a) to (f); and
- (b) any other data or information necessary for the proper installation, use and continued airworthiness of the FDRIU.

12 Minimum performance standard — technical data

The technical data mentioned in paragraph 21.605 (2) (b) of CASR must include the following:

- (a) the operating instructions and equipment limitations for the FDRIU, including full descriptions of the following:
 - (i) the operational capability of the equipment;
 - (ii) if the applicant requests approval of a deviation from any performance standard mentioned in this Schedule — the operational or installation limitations that would result from that deviation;
- (b) the installation procedures for the FDRIU and limitations, including the following:
 - (i) descriptions of the extent to which the FDRIU, when installed according to the installation procedures, will continue to meet the requirements of this Schedule;
 - (ii) descriptions of any unique aspects of the installation;
 - (iii) as an integral part of the procedures — the following manufacturer’s statement:

The conditions and tests required for ATSO authorisation of this article are minimum performance standards. It is the responsibility of the person installing this article on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the standards set out in ATSO-C1007b. ATSO articles must have separate authorisation for installation on or within an aircraft.
- (c) schematic drawings for the installation procedures;
- (d) wiring diagrams for the installation procedures;
- (e) equipment specifications;
- (f) a list of the components that make up the FDRIU, including:
 - (i) part numbers referenced to the relevant part; and
 - (ii) if applicable — vendor part number cross-references;

- (g) an installation manual (*IM*), a component maintenance manual (*CMM*) or both an IM and a CMM for the FDRIU that include the following:
 - (i) information about the periodic maintenance, calibration and repair of the installed equipment for its continued airworthiness;
 - (ii) recommended inspection intervals and service life of the installed FDRIU;
 - (iii) details of any CASA approval to deviate from any performance standard in this Schedule;
- (h) technical data for material identification and specifications;
- (i) the functional test specifications to be used to test each FDRIU to ensure its compliance with this Schedule;
- (j) analysis and test results in relation to the FDRIU to substantiate compliance with this Schedule;
- (k) nameplate drawings showing how the FDRIU will be marked in accordance with the requirements mentioned in paragraph 21.607 (1) (c) of CASR and clause 10;
- (l) a list of the drawings and processes, including revision level, necessary to define the design of the FDRIU and its components;
- (m) an Environmental Qualification Form, as mentioned in RTCA/DO-160F, for each component of the FDRIU;
- (n) details of the computer software used in the FDRIU, including the following:
 - (i) if the FDRIU includes a digital computer — a statement of assurance and accompanying evidence that the software has been developed in accordance with RTCA/DO-178C;
 - (ii) a Plan for Software Aspects of Certification mentioned in RTCA/DO-178C;
 - (iii) a Software Configuration Index mentioned in RTCA/DO-178C;
 - (iv) a Software Accomplishment Summary mentioned in RTCA/DO-178C;
- (o) if the FDRIU includes a complex custom micro-coded component:
 - (i) a Plan for Hardware Aspects of Certification mentioned in RTCA/DO-254; and
 - (ii) a hardware verification plan mentioned in RTCA/DO-254; and
 - (iii) a top-level drawing and Hardware Accomplishment Summary mentioned in RTCA/DO-254.

Note to Part 21 Manual of Standards

The *Part 21 Manual of Standards (MOS)* (in force under the *Civil Aviation Safety Regulations 1998*) as shown in this compilation comprises *Part 21 Manual of Standards Instrument 2016* amended as indicated in the Tables below.

Table of Manual of Standards and Amendments

Year and number	Date of registration on FRL	Date of commencement	Application, saving or transitional provisions
Part 21 MOS 2017	31 May 2016 (see F2016L00915)	1 June 2016 (s. 1.5)	—
Part 21 MOS 2017 Amendment No. 1	31 May 2017 (see F2017L00619)	31 May 2017 (s. 2)	—
Civil Aviation Legislation Amdt & Repeal (ATSOs) Instrument 2017	30 November 2017 (see (F2017L01553))	30 November 2017 (s. 2)	—

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
s. 1.5	am. F2017L00619 rep. F2017L01553
s. 1.10	am. F2017L00619; F2017L01553
Part 13	am. F2017L01553
Part 14	ad. F2017L01553
Schedule 21	ad. F2017L01553
Schedule 22	ad. F2017L01553
Schedule 23	ad. F2017L01553
Schedule 24	ad. F2017L01553
Schedule 25	ad. F2017L01553
Schedule 26	ad. F2017L01553
Schedule 27	ad. F2017L01553
Schedule 28	ad. F2017L01553