

## ETSO-2C176a

*ED Decision 2020/011/R (applicable from 25.7.2020)*

### AIRCRAFT COCKPIT IMAGE RECORDER SYSTEMS

#### 1 Applicability

This ETSO provides the requirements that aircraft cockpit image recorder (CIR) systems that are designed and manufactured on or after the date of this ETSO must meet in order to be identified with the applicable ETSO marking.

#### 2 Procedures

##### 2.1 General

The applicable procedures are detailed in CS-ETSO, [Subpart A](#).

##### 2.2 Specific

All the information specified in EUROCAE ED-112A, Section 2-1, 2-1.3.4, excluding item 6, shall be documented in a manual and be made available to the accident investigation authorities on request. In addition, if special tools or recovery techniques are used to retrieve recorded information from any memory device used within the crash-protected memory module removed from a crash-damaged recorder, these tools/recovery techniques shall be also made available to the accident investigation authorities on request.

Note: Requests from accident investigation authorities can be independent of any ongoing investigation.

#### 3 Technical Conditions

##### 3.1 Basic

##### 3.1.1 Minimum Performance Standard

The applicable standards are those provided in the applicable sections of EUROCAE ED-112A, MOPS for Crash Protected Airborne Recorder Systems, dated September 2013 that pertain to the Cockpit Image Recorder (CIR) type, except chapters III-1 and III-6, and Sections 2-1.1, 2-1.5, 2-1.6, 2-1.11, 2-1.12, 2-3.1, 2-5, 3, Annex III-A, Annex III-B, and other ED-112A requirements related to aircraft-level equipment installation, flight testing, and aircraft maintenance as amended by Appendix 1 to this ETSO.

The table below lists the types of recorder and the ED-112A section or part that contains the MPS for each of them:

**Table 1 — CIR MPS Requirements**

CIR Type	ED-112 Reference
Single CIR in a non-deployable recorder	Section 2 and Part III.
CIR function in a deployable recorder	Section 2 (except for tests covered by ETSO-2C517) and Part III. The recorder shall also comply with ETSO-2C517.
CIR function in a combined non-deployable recorder	Section 2, Section 4 and Part III.

CIR Type	ED-112 Reference
CIR function in a <u>combined deployable</u> recorder	Section 2 (except for the tests covered by ETSO-2C517), Section 4 and Part I.  The recorder shall also comply with ETSO-2C517.

Note: A CIR article may cover multiple types. A CIR may be a combined CIR and may also be deployable, in which case the applicable MOPS are in Sections 2, 4, Part I and the MOPS of ETSO-2C517, following the table above.

### 3.1.2 Environmental Standard

See CS-ETSO, [Subpart A](#), paragraph 2.1

### 3.1.3 Software

See CS-ETSO, [Subpart A](#), paragraph 2.2

### 3.1.4 Airborne Electronic Hardware

See CS-ETSO, [Subpart A](#), paragraph 2.3

## 3.2 Specific

### 3.2.1 Failure Condition Classification

See CS-ETSO, [Subpart A](#), paragraph 2.4.

A failure of the function defined in paragraph 3.1.1 of this ETSO is a minor failure condition.

A loss of the function defined in paragraph 3.1.1 of this ETSO is a minor failure condition.

Note: The failure classification requirement is driven by the use of recorders in accident investigations.

## 4 Marking

### 4.1 General

See CS-ETSO, [Subpart A](#), paragraph 1.2

### 4.2 Specific

#### 4.2.1 Lettering Identification

The equipment shall comply with the identification requirement in EUROCAE ED-112A, Section 2-1, paragraph 2-1.16.3, if it is fixed, and those of ETSO-2C517, if it is deployable.

## 5 Availability of Referenced Documents

See CS-ETSO, [Subpart A](#), paragraph 3

[Amdt ETSO/6]

[Amdt ETSO/13]

[Amdt ETSO/16]

## Appendix 1 to ETSO-C176a – MPS for Crash-Protected Airborne Recorder Systems

ED Decision 2020/011/R

The standard EUROCAE ED-112A, MOPS for Crash Protected Airborne Recorder Systems, dated September 2013, shall be modified as per Table 1 below.

**Table 1 — Modification of EUROCAE ED-112A**

Location	Initial ED-112A text	Amending text
2-1.16.2 a. iii.	Impact shock, shear and tensile test, penetration resistance, static crush, deep sea pressure and sea water immersion.	Impact shock, shear and tensile test, penetration resistance, static crush, deep sea pressure and sea water immersion. Deep sea pressure and sea water immersion may be performed on two different units provided that both units undergo the rest of the sequence and that the period of the deep sea pressure test is 90 days.
2-4.2.7 a.	Unless it can be shown that the recording medium can withstand the conditions associated with deep sea immersion and that it is unlikely to be damaged as a consequence of collapse of any protective armour, immerse the recorder in sea water at a pressure of 60 MPa (equivalent to a depth of 6 000 m (20 000 feet) for a period of 30 days. This period may be reduced to 24 hours provided that the methods and materials used to protect the recording medium have been shown to be unaffected by sea water. To avoid damage to the test equipment, this test may be performed using any suitable liquid in the pressure chamber itself together with a means to separate this liquid from the sea water in which the recorder is immersed.	Unless it can be shown that the recording medium can withstand the conditions associated with deep-sea immersion and that it is unlikely to be damaged as a consequence of collapse of any protective armour or except if the recorder is deployed during or following impact with water, immerse the recorder in seawater at a pressure of 60 MPa (equivalent to a depth of 6 000 m, i.e. 20 000 feet) for a period of 90 days. This period may be reduced to 24 hours provided that the test is performed once after the sea water immersion test in 2-4.2.7 b. To avoid damage to the test equipment, this test may be performed using any suitable liquid in the pressure chamber itself, together with a means to separate this liquid from the seawater in which the recorder is immersed.
2-4.2.7 b.	Unless it can be shown that the recording medium and the identification required by paragraph 2-1.16.3 are resistant to the corrosive effects of sea water, immerse the recorder in sea water at a depth of 3 m and nominal	Unless it can be shown that the recording medium and the identification required by paragraph 2-1.16.3 are resistant to the corrosive effects of seawater, immerse the recorder in seawater at a depth of 3 m and a temperature of at least + 25.0 °C for a period of 90 days.

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<b>Location</b>	<b>Initial ED-112A text</b>	<b>Amending text</b>
	temperature of +25°C for a period of 30 days.	

[Amdt ETSO/16]