

ETSO-C119e

ED Decision 2022/018/R

AIRBORNE COLLISION AVOIDANCE SYSTEM II (ACAS II) VERSION 7.1 WITH HYBRID SURVEILLANCE**1 Applicability**

This ETSO provides the requirements that Airborne Collision Avoidance System II (ACAS II) Version 7.1 equipment that is 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

None.

3 Technical Conditions**3.1 Basic****3.1.1 Minimum Performance Standard**

The applicable standards are those provided in EUROCAE Document ED-143, 'Minimum Operational Performance Standards for Traffic Alert and Collision Avoidance System II (TCAS II)', dated September 2008, Section 2 as modified by Change 1 dated April 2009, Change 2 (Version 7.1) dated April 2013, and by [Appendix 1](#) to this ETSO and EUROCAE Document ED-221A, 'Minimum Operational Performance Standards (MOPS) for Traffic Alert and Collision Avoidance System II (TCAS II) Hybrid Surveillance', dated December 2015, Section 2, as modified by [Appendix 2](#) to this ETSO.

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.

Failure of the function defined in paragraph 3.1.1 of this ETSO resulting in misleading information is a hazardous failure condition.

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

4 Marking

4.1 General

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

4.2 Specific

None.

5 Availability of Referenced Documents

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

[Amdt ETSO/11]

[Amdt ETSO/17]

APPENDIX 1 TO ETSO-C119e – TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM II (TCAS II) VERSION 7.1 AMENDMENT TO THE EUROCAE ED-143 CHANGE 2 REQUIREMENTS

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This Appendix lists the EASA modifications to the MPS for Traffic Alert and Collision Avoidance System (TCAS) Airborne Equipment, TCAS II Change 2, dated April 2013.

When the own ship is on the ground, clarification is required to allow the system to limit the output of TCAS intruders to the display to those within 3 000 feet of the own altitude. In lieu of section '2.2.2 System Performance' of EUROCAE ED-143 Change 2, substitute the following:

2.2.2 System Performance

Note: *When operating within the maximum aircraft transponder population and electromagnetic interference levels defined in subparagraph 2.2.1.2, TCAS II will provide a level of performance for active surveillance of targets-of-interest that will support the requirements for generation of collision advisory information.*

Specifically, TCAS II will generate a surveillance track in range and altitude on a target-of-interest at the range and with the track probability and range accuracy specified below. This is to ensure that a correct resolution advisory can be issued in time for the pilot to maintain adequate vertical separation at closest-point-of-approach.

TCAS II will also generate, whenever possible, a surveillance track in range and altitude on a target-of-interest at the range and with the track probability and range accuracy specified below such that a correct traffic advisory can be issued as a precursor to the resolution advisory.

In addition to the surveillance requirements to support the generation of resolution and traffic advisories, TCAS II will display the range and, if available, the altitude and bearing position information on targets that generate advisories. The bearing position information will be generated according to the accuracy requirement specified below.

TCAS II will also generate for display, whenever possible, surveillance range, altitude and bearing position information on Mode C and Mode S aircraft that are within the range specified below and within $\pm 10\,000$ ft altitude relative to TCAS II when airborne, and within $\pm 3\,000$ ft altitude relative to TCAS II when on the ground.

It is acceptable to limit the output of TCAS intruders to the display to those within 3 000 ft of the own altitude when the own aircraft is on the ground. This is permitted (but not required) so that the altitude surveillance volume for TCAS Mode C intruders can be consistent with the Mode S surveillance altitude limits modified in EUROCAE ED-143 Change 2 (section 2.2.4.6.2.2.1). This allowance to limit the display to $\pm 3\,000$ feet does not modify the surveillance altitude volumes which are defined in EUROCAE ED-143, section 2.2.4.6.

The system shall use the definition of on-ground as defined in EUROCAE ED-143, Volume II, Section 2.1.14. Alternatively, the system may use the definition of 'operating on surface' in EUROCAE ED-221A, Section 2.2.8, for on-ground.'

[Amdt ETSO/11]

[Amdt ETSO/17]

APPENDIX 2 TO ETSO-C119e – TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM II (TCAS II) VERSION 7.1 HYBRID SURVEILLANCE AMENDMENT TO THE EUROCAE ED-221A REQUIREMENTS

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This Appendix lists the EASA modifications to EUROCAE ED-221A for Traffic Alert and Collision Avoidance System II (TCAS II) Hybrid Surveillance, dated December 2015.

To facilitate the monitoring by maintenance personnel of the hybrid surveillance functionality, add the following requirement as the fifth paragraph (including the Note) in Section 2.2.10, Monitoring Requirements:

‘TCAS II units shall provide a means for presenting logged hybrid surveillance faults to maintenance personnel to enable on-wing monitoring of hybrid surveillance functionality at periodic intervals.

Note: This requirement enables the implementation of a scheduled maintenance task to ensure that hybrid surveillance is functional on aircraft without a centralised warning system and/or an on-board maintenance computer.’

[Amdt ETSO/11]

[Amdt ETSO/17]