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Minimum Operational Performance Standards for Traffic Alert and Collision Avoidance System II (TCAS II)

Version 7.1

Change 1

RTCA DO-185B, Change 1
RTCA DO-185B, Supersedes RTCA DO-185A
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Executive Summary

This Change 1 document specifies a change to the TCAS II requirements contained in RTCA document DO-185B. The rationale for the change is described in change proposal CP123, which was approved by the SC-147 Requirements Working Group.

The first part of the change concerns an aspect of the TCAS multi-aircraft logic. It affects the "middle" aircraft of a multi-threat situation, and removes the feature that would have required a green arc to accompany that aircraft's RA.

The second part of the change clarifies the coding of certain bits reporting Hybrid Surveillance capability within the Data Link Capability Report, to be consistent with a change made to DO-300.

Section 1 provides the text changes to Volume I.

Section 2 provides changes to the Pseudocode in Volume II, Attachment A.

Section 3 provides changes to the state charts in Volume II.

Section 4 provides changes to the TSIM data set that is specified for the verification of the TCAS implementation. This material is not part of DO-185B, but is accompanying material distributed by FAA, not by RTCA.

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1 Changes to Volume I

The following correction is needed in order to more accurately describe the behavior of the multi-aircraft logic when own aircraft is “projected in the middle”.

2.2.5.3.3 Multi-Aircraft Logic

Note: *Special rules are invoked when a TCAS-equipped aircraft is involved in a multiple-aircraft encounter. The pilot of the aircraft with "projected clear airspace above" is told to CLIMB, and the pilot of the aircraft with "projected clear airspace below" is told to DESCEND. Aircraft "projected in the middle" are told to limit their climb and their descent until the aircraft above or below are no longer in conflict.*

The selection of a positive DESCEND advisory in a multi-aircraft situation is also subject to the performance limitations of the TCAS aircraft when it is near the Descend Inhibit altitude threshold. In this case, a negative DON'T CLIMB will be selected instead of DESCEND.

The multi-aircraft logic has been designed to prevent premature level-off RAs when own is to pass between two threats vertically. This requires retention of a positive RA until certain criteria have been met so that vertical separation is maximized. The multi-aircraft logic also includes the ability to model and select Increase Rate RAs and sense reversals to better resolve situations that are deteriorating due to adverse maneuvers by own aircraft or one of the threats. (The ability to generate an Increase Rate RA is subject to the INCREASE CLIMB and INCREASE DESCENT inhibit indications and thresholds.) The logic also performs an unbiased evaluation of all new threats to select the optimum RA against all rather than constraining the RA to be selected against the second or third threat by the initial choice against the first.