

Traffic alert and Collision Avoidance System (TCAS)

Introduction of change 7.1 software

Introduction

The Traffic alert and Collision Avoidance System (TCAS) has been introduced in order to reduce the risk of mid-air collisions or near mid-air collisions between aircraft. When TCAS II version 7.1 is implemented the probability of mid-air collisions will be reduced significantly. *

The introduction of TCAS change 7.1 software is available for Fokker 50, Fokker 70 and Fokker 100 aircraft as well as for other types of aircraft like Boeing 727 and 737 series, Bombardier Dash 8 and CRJ.

(* source: www.eurocontrol.int)



Your needs

The Traffic alert and Collision Avoidance System (TCAS) has been introduced in order to reduce the risk of mid-air collisions or near mid-air collisions between aircraft. Studies conducted for Eurocontrol, using recently recorded operational data, indicate that currently the probability of a mid-air collision in European airspace equates to one in every 3 years. When TCAS II version 7.1 is implemented that probability will reduce by a factor of 4. *

EASA recently issued Safety Information Bulletin EASA SIB No: 2009-16, in which they indicated that there have been a number of instances of incorrect pilot response to TCAS Resolution Advisories (RA) due to misinterpretation of the RA aural annunciations and RA displays, which have resulted in serious incidents.

The "Adjust Vertical Speed, Adjust" resolution advisory requires the reduction of vertical speed to 2000, 1000, 500, or 0 feet/min. In the cases of incorrect responses, the pilots increased their vertical speed instead of reducing it, consequently, causing the situation to deteriorate.

Enhancements in training alone can improve the behavior of flight crews when an "Adjust Vertical Speed, Adjust" resolution advisory is issued, but is not sufficient to avoid all the opposite reactions.

A second reason to update the current TCAS software is a series of mid-air encounters in which safety margins have been lost (including 2 accidents), due to the failure of the TCAS system to reverse some Resolution Advisories (RA) when a reversal is more efficient to resolve the threat of a collision.

It is expected that EASA will mandate this change 7.1 software update as an Airspace Usage Requirement per December 01/2015.

(* source: www.eurocontrol.int)

Your benefits

TCAS software change 7.1 improves safety by implementing the following improvements:

- The "Adjust Vertical Speed, Adjust" (AVSA) RA of TCAS software change 7.0. Several AVSA RA versions have been replaced by a single "Level-off" RA. The associated aural message is straightforward and the associated man oeuvre corresponds to the standard manoeuvre already performed in critical Situations (refer to figure 1).
- The reversal logic of TCAS software change 7.0 by detecting geometries by easing the triggering thresholds of reversal RAs in encounters in which the aircraft remain within 100 feet vertical separation to each other. Furthermore the change adds detection of RA compliance by the own aircraft and prediction of vertical separation at the closed point of approach to detect the need of reversal RA (refer to figure 2).

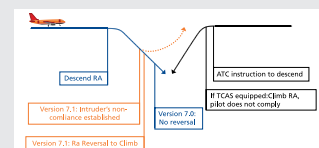


Figure 1 (source: www.eurocontrol.int)

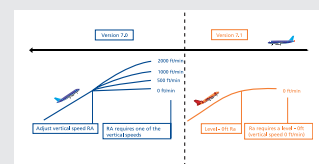


Figure 2 (source: www.eurocontrol.int)

Product description

TCAS software change 7.1 will be incorporated by means of a software or a hardware update of the unit (depending on the specific vendor). Upgrade of the unit will be performed either on wing or in the shop. Hardware changes to the aircraft are not necessary.

	TCAS Change 7.0	TCAS Software version Change 7.1
Vendor model	Part Number	Part Number
Honeywell TPU 67	066-01146-1111 066-01146-1211	To Be Determined
Honeywell TPA-81A	066-50000-2120 066-50000-2121 066-50000-2220 066-50000-2221	No software change is planned by Honeywell yet, unit to be replaced by pn TPA-100B
ACSS RT-951	7517900-55003	7517900-55010
ACSS RT-910	4066010-910 4066010-912	4066010-911
ACSS RT-950	7517900-10003 7517900-10004 7517900-10007 7517900-10011	7517900-10010
Collins TTR-920	622-8971-022	No software change is planned by Collins yet, unit to be replaced by pn TTR-921
Collins TTR-921	822-1293-002	822-1293-003

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