

SAFETY FOCUS

2013/01



AIRBORNE COLLISION AVOIDANCE SYSTEM (ACAS) COMPLYING WITH RESOLUTION ADVISORIES (RAs)

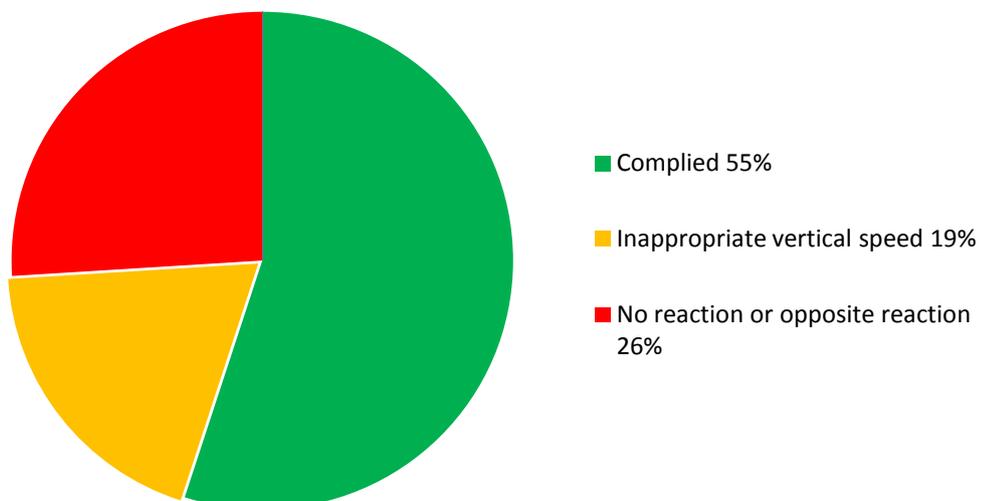
INTRODUCTION

The purpose of this BASP Safety Focus is to raise awareness of the importance of complying with Resolution Advisories and to summarise the changes introduced by Traffic Alert and Collision Avoidance System (TCAS) II Version 7.1.

ACAS is often referred to as TCAS and the terms used interchangeably. However, in its strictest sense, ACAS refers to the concept of collision avoidance, whereas TCAS is associated with commercially available technology that satisfies International Civil Aviation Organization (ICAO) standards. For example, TCAS II (Version 7.0/7.1) is the only approved commercially available implementation of ACAS II.

Research by Eurocontrol has found that climb/descend RAs are correctly complied with in only 55% of cases in Terminal Manoeuvring Areas (TMAs) and 65% of cases in en-route airspace. In 19% of the cases in TMAs climb/descend RAs are followed but with an inappropriate vertical speed, either too high or too low. In 26% of the cases there is either no reaction from the crew or an opposite response.

Reaction to RAs in TMAs



ACTION TO BE TAKEN

Focusing on the following practices will improve safety:

Follow RAs – Correct and prompt responses to RAs are vital

RAs provide successful mitigation of the risk of mid-air collision.

Avoid excessive responses to RAs

Required vertical rates are indicated on flight deck instruments.

Reduce rates of climb/descent near level off

1,000 ft before level off vertical speed should not exceed 1,500 ft/min.

TCAS traffic display must not be used to determine degree of collision risk

The bearing displayed by ACAS is not sufficiently accurate to support the initiation of horizontal manoeuvres based solely on the traffic display.

Tell Air Traffic Control (ATC) as soon as possible! 'TCAS RA'

RAs must be reported to ATC if they require a departure from current ATC clearance or instruction – TAs are not required to be reported – for correct phraseology consult CAP 413.

Level when RA weakens and return promptly to cleared level when 'Clear of Conflict' annunciated

Deviation from clearance can be minimised by following Advisory quickly.

'Increase descent' or 'Increase climb' (strengthening RAs) must be followed as a matter of priority

An initial RA will strengthen if insufficient response to the initial RA or if either aircraft accelerates toward the other aircraft.

ACAS Training

Operators and providers of simulated training should ensure that any device used to conduct ACAS training, at any stage, meets the requirements and objectives of that training and has the characteristics outlined in CAA IN-2012/008.

TCAS II Version 7.1 has been developed following the discovery of two safety issues with Version 7.0. With Version 7.0 'Adjust Vertical Speed' RA required reduction of vertical speed as indicated on flight instruments leading to incorrect responses, with pilots increasing vertical speed instead of reducing it, and vice versa. Version 7.0 also failed to reverse an RA when converging aircraft remained within 100 ft, which can occur when one aircraft is not following the RA. New aircraft must be equipped with Version 7.1 as from 1 March 2012 and all existing installations must be upgraded by 1 December 2015.

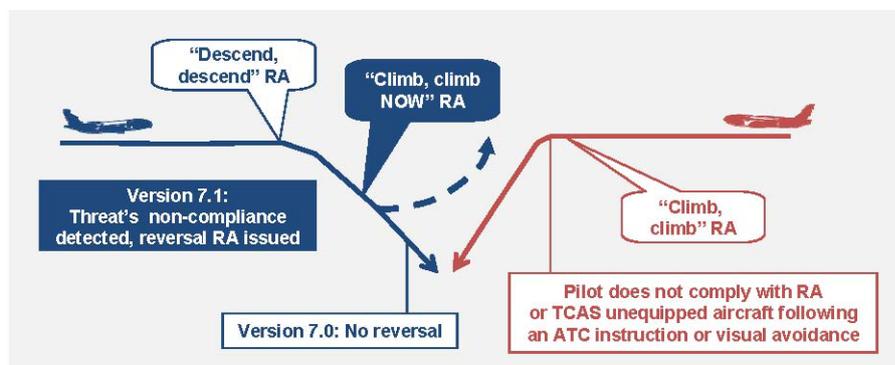
New 'Level Off' RA

Version 7.1 requires reduction of vertical rate to 0 ft/min.

Level off must be achieved promptly - not at the next Flight Level.

Improved Reversal Logic

A feature has been added to Version 7.1 logic which monitors RA compliance in coordinated encounters (i.e. when both aircraft are TCAS II equipped). When it is detected that an aircraft is not responding correctly to an RA, a reversal RA will be issued to the aircraft which manoeuvres in accordance with the RA. In single equipage encounters (i.e. when only one aircraft is TCAS II equipped), version 7.1 will recognise the situation and will issue a reversal if the unequipped threat aircraft moves in the same vertical direction as TCAS II equipped aircraft. Although the reversal logic change is transparent to flight crews, it will, nevertheless, bring significant safety improvements.



What TCAS will not tell you!

ACAS will not track or display non-transponder equipped aircraft, nor aircraft with an inoperable or Mode A transponder.

ACAS may not display all proximate transponder equipped aircraft in areas of high density traffic but will still issue RAs as necessary.

ACAS will neither display nor give alerts against intruders with vertical speed in excess of 10,000 ft/min.

FURTHER INFORMATION

UK CAA:

[Information Notice IN-2012/008](#) 'Airborne Collision Avoidance System II (ACAS II) Guidance for Pilots on the Use of Training Devices'

[CAP 789](#) 'Requirements and Guidance Material for Operators'

[CAP 413](#) 'Radiotelephony Manual'

[NATS](#):

AIC P 106/2011 'Airborne Collision Avoidance System II (ACAS II) – Pilot Training'

AIC P 079/2011 'Airborne Collision Avoidance System (ACAS) and non-ACAS Traffic Proximity Alerting Systems (TPAS) – Pilot and Air Traffic Service Provider Responsibilities'

Eurocontrol:

www.eurocontrol.int/dossiers/acas-ii

www.eurocontrol.int/documents/acas-2-bulletin-issue-16

[ICAO](#):

Doc 8168 'OPS - Aircraft Operations'

Doc 9863 'Airborne Collision Avoidance System (ACAS) Manual'

Miscellaneous:

www.skybrary.aero/index.php/Airborne_Collision_Avoidance_System (ACAS)

www.nbaa.org/ops/cns/tcas

<http://adsb.tc.faa.gov/TCAS.htm>

QUERIES

Any queries or further guidance required as a result of this communication should be addressed to CAA Flight Operations Policy at the following e-mail address: FOP.Admin@caa.co.uk.

CANCELLATION

This Safety Focus shall remain in force until 30 September 2013.