

Honeywell Solutions for TCAS II Change 7.1

Honeywell is a pioneer in Traffic Collision Avoidance Systems (TCAS) development with over 300 million logged departures.

With air traffic expected to double in the next 20 years to over 1 billion flights, the need for enhanced situational awareness of the increasingly congested airspace is greater than ever. Honeywell's traffic surveillance systems combine industry leading technology, enhanced capability, and superior performance to mitigate the risk of a potential mid-air collision by addressing key safety hazards and providing a clear course of action when a danger is presented.

TCAS Change 7.1

The aviation community has released an important new standard for TCAS operation. A revised TCAS II Minimum Operational Performance Standards (MOPS) document, RTCA/DO-185B, was jointly developed between RTCA and EUROCAE. The FAA has released a new Technical Standard Order (TSO), TSOC119c, corresponding to the new MOPS, and EASA has released the associated European TSO, ETSO-C119c.

The new standard, Change 7.1, addresses two safety issues:

- Change Proposal 115. Changes the current TCAS II aural warning from "Adjust Vertical Speed, Adjust" to "Level Off, Level Off."
- Change Proposal 112E Corrects missed and late TCAS reversals.

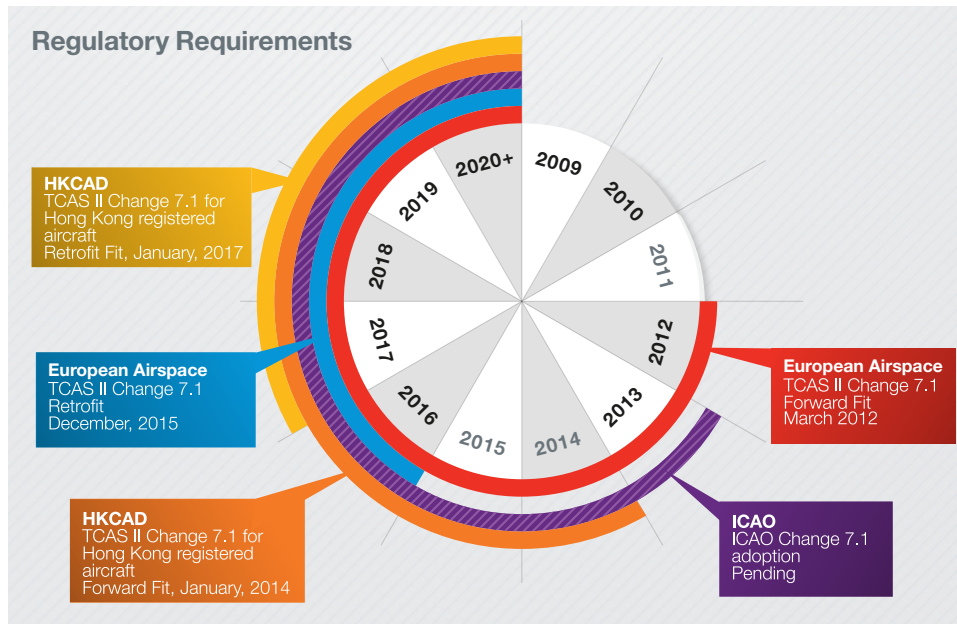
Regulatory Requirements

- **TCAS II Change 7.1** is mandatory in European Airspace for aircraft delivered from March 2012 while aircraft delivered prior to March 2012 must be compliant by December 2015.

Regulatory agencies across the globe, in conjunction with the air traffic modernisation efforts, are considering Hybrid Surveillance requirements and possible mandates as one of many means for improving air traffic navigation. Honeywell's TCAS Change 7.1 solution includes Hybrid Surveillance as standard - thereby ensuring compliance with any future mandates*.

Additional information on European TCAS II Change 7.1 Program is available on the Eurocontrol website:

www.eurocontrol.int/acas



*Subject to future requirement changes.

TCAS Change 7.1 Updates

The TCAS Change 7.1 Updates are designed to reduce the risk of possible mid-air collisions in the increasingly congested skies. These changes are:

“Adjust Vertical Speed, Adjust” (AVSA)

The AVSA Resolution Advisory (RA) has been determined to be confusing, and there are documented examples of pilots failing to respond as intended. The solution in Change 7.1 replaces four AVSA Resolution Advisories with a single “Level Off, Level Off” Resolution Advisory. See Figure 1.1.

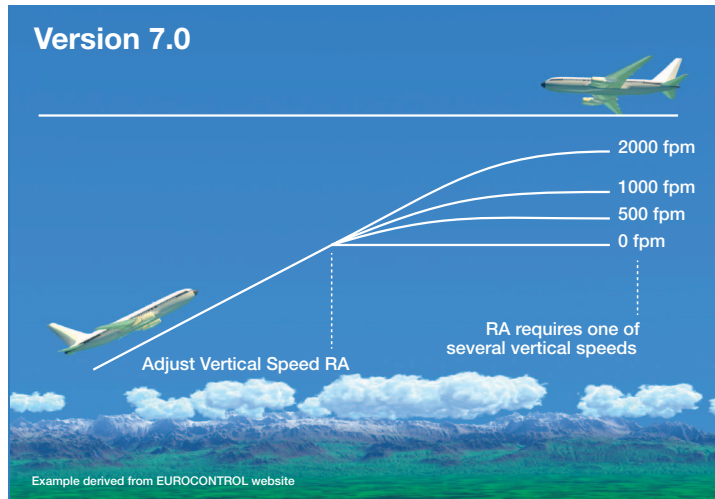


Figure 1.1: New Resolution Advisory “Level Off, Level Off”, replacing the “Adjust Vertical Speed, Adjust” Resolution Advisory

Hybrid Surveillance

By selecting Honeywell’s TCAS Change 7.1 upgrade solution you will automatically achieve Hybrid Surveillance functionality and compliance with future anticipated mandates*. Hybrid Surveillance is an important part of the SmartTraffic™ family of ADS-B In enabled technologies hosted within Honeywell TCAS Traffic Computers.

Whereas the Honeywell TPA-100A Traffic Computer had an enhanced traffic detection range of up to 100nm, ADS-B Out technology now enables an even longer range of transmission and therefore detection. As a result aircraft equipped with the new Honeywell TPA-100B Traffic Computer (and ATSAW capable display) can benefit from an improved detection range of up to 150 nm.

Hybrid Surveillance further improves situational awareness and safety in high density airspace and supports air traffic modernisation efforts by reducing 1090 MHz frequency congestion. Hybrid Surveillance is an evolution of the Smart Interrogation functionality that was first introduced on the Honeywell TPA-100A, which reduced traffic interrogation in congested airspace, Hybrid Surveillance allows the TCAS Traffic Computer to further reduce active interrogations by using intruder position data received via ADS-B equipped aircraft. See Figure 2.1. Hybrid Surveillance capability, which meets the qualification and requirements of the Hybrid Surveillance Minimum Operational Performance Standards (MOPS) document RTCA/DO-300, is identified as optional functionality within FAA TSO-C119c.

* Subject to future requirement changes.

TCAS Reversals

TCAS reversals were introduced in TCAS standard Change 7.0 to adapt to changing situations where the original sense had clearly become the wrong thing to do, in particular the situation when one of the pilots decides not to follow the Resolution Advisory or is instructed by ATC to perform a particular manoeuvre. The solution in Change 7.1 introduces improvements to the current reversal logic to address late issuance of reversal Resolution Advisories and potential failures to initiate reversal Resolution Advisories. See Figure 1.2.

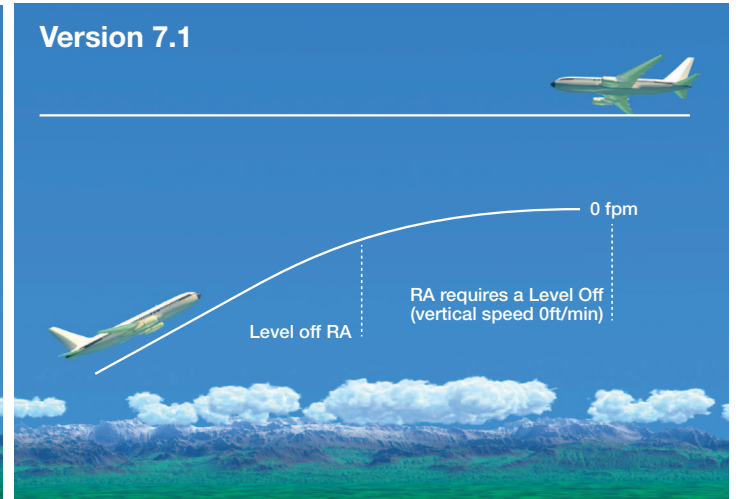


Figure 1.2: TCAS Reversals

TCAS Reversals

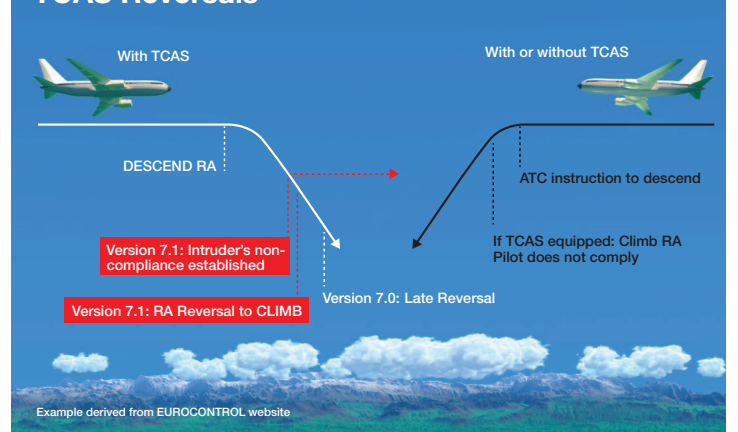


Figure 1.2: TCAS Reversals

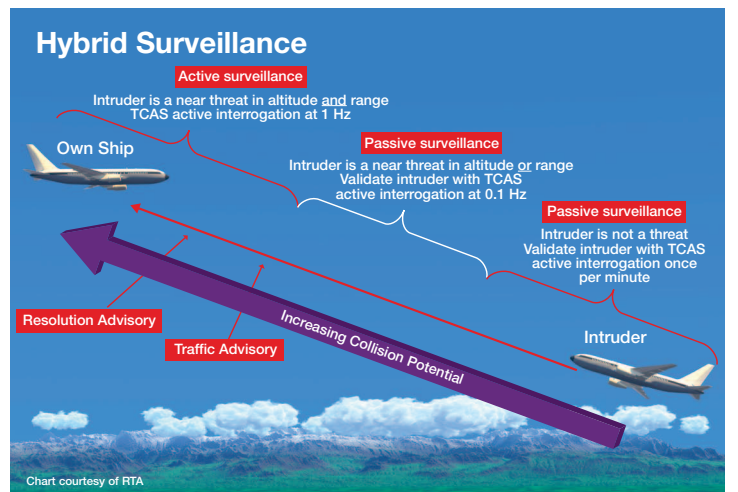


Figure 2.1: Hybrid Surveillance

Honeywell's TCAS Change 7.1 solution includes Hybrid Surveillance as standard - thereby ensuring compliance with any future mandates.

Honeywell Solutions for Change 7.1 and Hybrid Surveillance

Product	Application	Change 7.1	Smart Traffic
AESS	Air Transport	Available	Future ¹
TPA-100	Air Transport Business Aviation	Available	Available ²
TPA-81*	Air Transport	Upgrade to TPA-100B ³	Upgrade to TPA-100B ³
TPU-67	Air Transport Business Aviation	Available	Upgrade to TPA-100B ³

Notes

¹ SmartTraffic availability is under evaluation.

² SmartTraffic includes Hybrid Surveillance and Airborne Situational Awareness (ATSAS) capability for Airbus Aircraft – go to aerospace.honeywell.com for more information.

³ Upgrade to TPA-100B is required to obtain Change 7.1 and SmartTraffic.

* TPA 81A R&O Support will end in December 2015.

TPA-100B Upgrades

The Honeywell TPA-100B TCAS Traffic Computers, part numbers 940-0351-001 (6 MCU) and 940-0451-001 (4 MCU), are fully compliant with TSO-C119c and ETSO-C119c, including both RTCA/DO-185B for TCAS II Change 7.1 and RTCA/DO-300 for Hybrid Surveillance.

The 940-0351-001 TPA-100B supersedes the 940-0300-001 TPA-100A for all aircraft, including Airbus and Boeing. The 940-0451-001 TPA-100B supersedes the 940-0400-001 TPA-100A for all aircraft.

Upgrading a 940-0300-001/940-0400-001 pre-Mod 6 TPA-100A to the 940-0351-001/940-0451-001 TPA-100B is a software and hardware upgrade that can be performed utilising a Honeywell Service Bulletin.

Upgrading the 940-0300-001/940-0400-001 Mod 6 TPA-100A to the 940-0351-001/940-0451-001 TPA-100B is a software only upgrade that can be performed on the aircraft utilising a Honeywell Service Bulletin.

TPA-100B TCAS Traffic Computer upgrades are available through Honeywell Customer Services. For more information please contact your local Honeywell representative.



TPA-100B Upgrades

Previous Versions	Change 7.1 + Hybrid	TSO	ETSO	Honeywell SB	OEM Cert	OEM SB
Airbus	940-0351-001	3Q 2010	2Q 2010	940-0300/ 0400-34-09	Complete	2Q 2011
Boeing	940-0351-001	3Q 2010	2Q 2010	940-0300/ 0400-34-09	Complete	2Q 2012

TPA-81 Upgrades

Honeywell is not upgrading the TPA-81A (PN 066-50000-272X, -222X, -232X, -262X, -272X) to Change 7.1 software due to the age of the TPA-81 series of products. Upgrade from the TPA-81 series to the TPA-100B, part number 940-0351-001, is required in order to obtain Change 7.1 in the time frame required for the proposed European regulation.

This upgrade requires no changes to aircraft wiring, connectors, or antennas and is fully compatible with installed ATC Transponders. This upgrade also provides the additional benefits of improved TCAS reliability and performance, full new equipment warranty, Traffic Computer part number commonality with new production aircraft deliveries for reduced sparring, ADS-B In Hybrid Surveillance via SmartTraffic, and software upgradeability to future SmartTraffic ADS-B In applications.

Contact Honeywell for upgrade pricing.

TPU-67A Upgrades

The Honeywell TPU-67A has been superseded by the TPU-67B. The TPU-67B part numbers listed below are fully compliant with the EASA mandate DO-185B.

TPU-67A	TPU-67B
066 - 01146 - 1111	066 - 01146 - 2121
066 - 01146 - 1211	066 - 01146 - 2221

These part numbers are TSO approved and in production. Please refer to Service Bulletin TPU 67A-34-28.

AESS Upgrade

The Honeywell Aircraft Environment Surveillance System (AESS) will be upgraded to ensure full compliance with EASA mandate DO-185B.

The upgraded parts are in production following TSO approval. Service Bulletin 965-1694-34-3 has been released to support this upgrade.



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Find out more

For general information on Honeywell TCAS solutions with Change 7.1 and SmartTraffic, please contact your Honeywell sales representative or call +1 800 601 3099 or +1 602 365 3099.

For more technical information, you may contact the appropriate Technical Sales Representatives:

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