

Honeywell Solutions for TCAS II Change 7.1

With air traffic expected to double in the next 20 years to over 1 billion flights, airlines want to be sure they have the best safety equipment onboard. 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.

Honeywell is a pioneer in TCAS development with over 50 years of design and support experience and over 300 million logged departures.

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), TSO-C119c, 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:

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

In addition to the two important safety improvements, the following changes are also included in Change 7.1:

- Corrects an issue when descending through 1000 ft AGL (Change Proposal 116)
- Modification of the Datalink Capability Report (Change Proposal 117)
- Transmission of TCAS Unit Part Number and TCAS Software Part Number (Change Proposal 122)
- Corrects TCAS multi-aircraft logic (Change Proposal 123)

“Adjust Vertical Speed, Adjust” (AVSA): The AVSA Resolution Advisory (RA) has been determined to be confusing, and there is a history of some pilots not responding to the AVSA RA as intended. The solution in Change 7.1 replaces 4 AVSA RAs with a single “Level Off, Level Off” RA. See Figure 1.1.

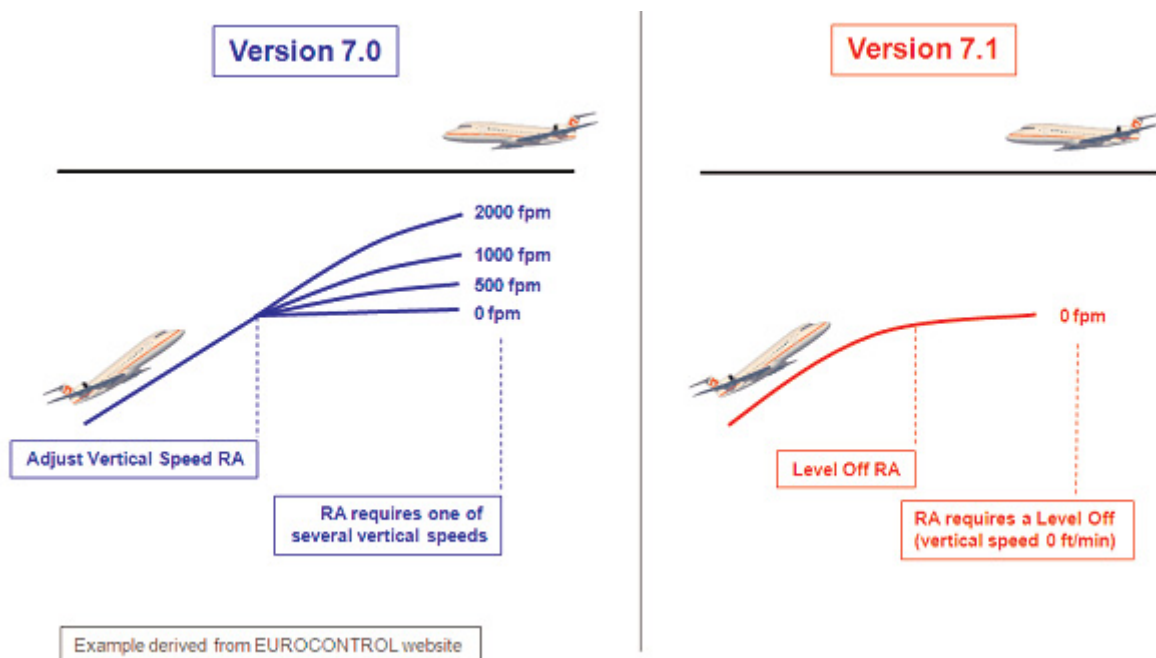


Figure 1.1: New Resolution Advisory “Level Off, Level Off”, replacing the AVSA RA

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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 (RA), or is instructed by ATC to

perform a particular maneuver. The solution in Change 7.1 introduces improvements to the current reversal logic to address late issuance of reversal RAs and potential failures to initiate reversal RAs. See Figure 1.2.

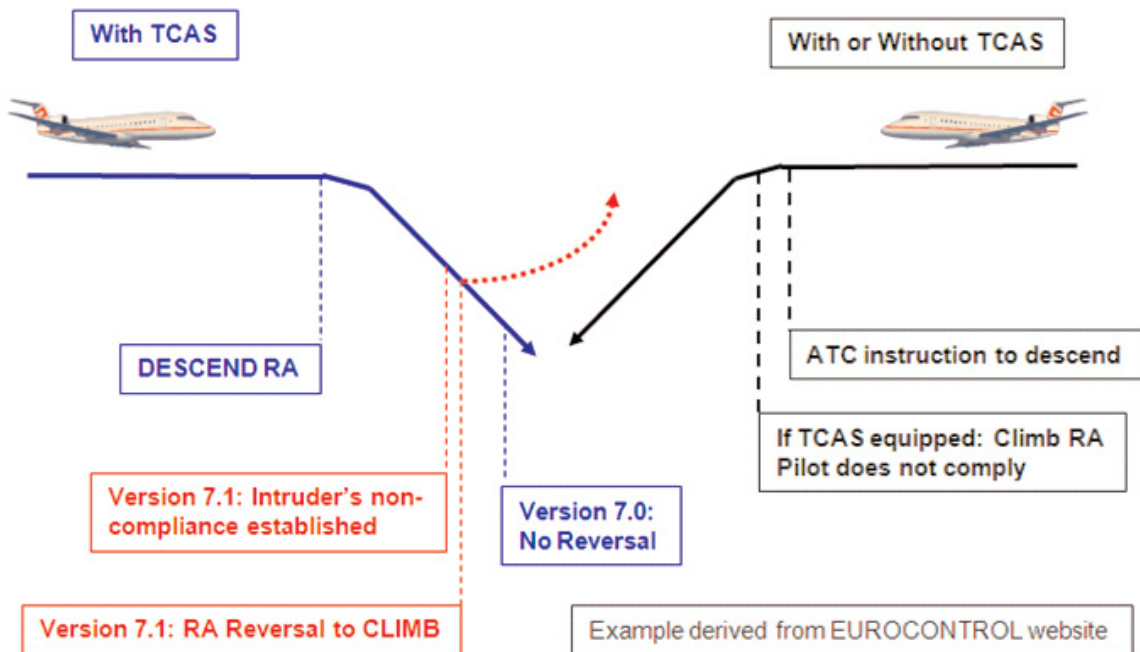


Figure 1.2: TCAS Reversals



Hybrid Surveillance:

Hybrid Surveillance is an important part of the SmartTraffic™ family of ADS-B In enabled technologies hosted within Honeywell TCAS Traffic Computers.

Hybrid Surveillance is a new technology which utilizes ADS-B In capability to improve situational awareness and safety in high density airspace and to support air traffic modernization efforts

by reducing 1090 MHz frequency congestion. Hybrid Surveillance allows the TCAS Traffic Computer to 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.

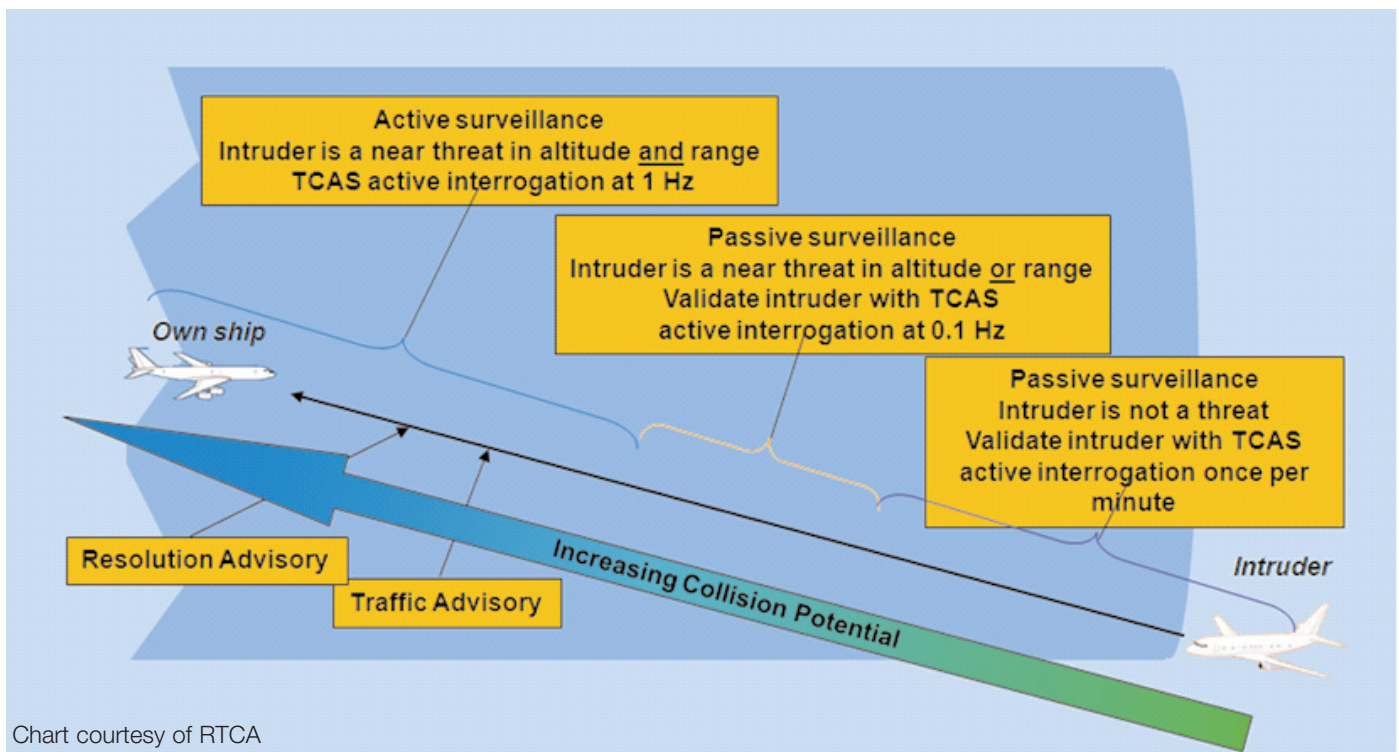


Chart courtesy of RTCA

Figure 2.1: Hybrid Surveillance

Regulatory Requirements:

ICAO has circulated an amendment for formal member state agreement which recommends TCAS II Change 7.1 adoption by 1-JAN-2014 for forward fit and 1-JAN-2017 for retrofit. EASA has published a Notice of Proposed Amendment (NPA) which proposes a required fitment schedule of 1-MAR-2012 for forward fit and 1-MAR-2014 for retrofit.

Regulatory agencies across the globe, in conjunction with the air traffic modernization efforts, are considering Hybrid Surveillance

requirements and possible mandates as one of many means for improving air traffic navigation. Upgrading now with Hybrid Surveillance prevents a possible costly future upgrade.

Additional information on European TCAS II Change 7.1 Programs is available on the Eurocontrol Web site:

www.eurocontrol.int/acas.

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Honeywell Offerings for Change 7.1 and Hybrid Surveillance: Notes:

Product	Application	Change 7.1	SmartTraffic
AESS	Air Transport	Planned ²	Future ³
TPA-100	Air Transport Business Aviation	Available	Available ¹
TPA-81	Air Transport	Upgrade to TPA-100B ⁴	Upgrade to TPA-100B ⁴
TPU-67	Regional Business Aviation	Planned ²	Future ³

- 1) SmartTraffic includes Hybrid Surveillance and Airborne Situational Awareness (ATSAW) capability for Airbus Aircraft – go to www.Honeywell.com/SmartTraffic for more information
- 2) Honeywell is following the regulatory requirements for Change 7.1 and will provide an upgrade in coordination with the firm mandates - plans will be announced when the mandates are finalized
- 3) SmartTraffic availability is under evaluation
- 4) Upgrade to TPA-100B is required to obtain Change 7.1 and SmartTraffic

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. These part numbers will be in production upon TSO approval.

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 utilizing 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 utilizing a Honeywell Service Bulletin.

TPA-100B TCAS Traffic Computer upgrades are available through Honeywell Customer Services. Contact your regional R&O Service Center or your Customer Services Sales Manager.

Previous Versions	Change 7.1 + Hybrid	TSO	ETSO	Honeywell SB	OEM Cert	OEM SB	
Airbus	940-0300-001	940-0351-001	3Q2010	4Q2010	3Q2010 940-0300-34-09	4Q2010	1Q2011
Boeing	940-0300-001	940-0351-001	3Q2010	4Q2010	2Q2011	3Q2011	Planned
B/R*	940-0300-001	940-0351-001	3Q2010	4Q2010	2Q2011	Planned	Planned
B/R*	940-0400-001	940-0451-001	3Q2010	4Q2010	4Q2010	Planned	Planned

* Business and Regional aircraft



TPA-100B Upgrade Pricing: Honeywell is pleased to offer the following discounted pricing schedule for TPA-100B upgrades accomplished via Honeywell Service Bulletin.

Installation certification is the responsibility of the operator and is not included in this offer). The published Operator Price for 2010 is \$15,000.

US Dollars	2010	2011	2012	2013	2014	2015
Discount off of Published Operator Price	\$5,000	\$4,000	\$3,000	\$2,000	\$1,000	\$0

Discount schedule subject to change

TPA-81 Upgrades:

Honeywell is not currently planning a Change 7.1 software upgrade to the TPA-81A due to timing of the proposed regulation in Europe and 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 sparing, ADS-B In Hybrid Surveillance via SmartTraffic, and software upgradeability to future SmartTraffic ADS-B In applications.

Contact Honeywell for upgrade pricing.

For more information:

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 602-365-3099. For more technical information, you may contact the appropriate Technical Sales Representatives:

AESS and TPU-67 Upgrades:

Honeywell is following the regulatory requirements for Change 7.1 and will provide an upgrade in coordination with availability of the firm mandates. Specific upgrade plans will be announced when the Change 7.1 mandates are finalized. Upgrades for SmartTraffic, including Hybrid Surveillance, are under evaluation.

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