Deviation request #64 for an ETSO approval for CS-ETSO applicable to Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II (ETSO- C119c)
Consultation Paper

Introductory note

The hereby presented deviation request shall be subject to public consultation, in accordance with EASA Management Board Decision No 7-2004[1] products certification procedure dated 30 March 2004, Article 3 (2.) of which states:

"2. Deviations from the applicable airworthiness codes, environmental protection certification specifications and/or acceptable means of compliance with Part 21, as well as important special conditions and equivalent safety findings, shall be submitted to the panel of experts and be subject to a public consultation of at least 3 weeks, except if they have been previously agreed and published in the Official Publication of the Agency. The final decision shall be published in the Official Publication of the Agency."

ETSO-C119c#8 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.7.2.5.2.3, specifically the requirement that the system receive valid radio altitude for 5 consecutive TCAS processing cycles before issuing TA/RAs at power off/on system reset. The deviation allows for a shorter validation time be permitted as long as the monitoring adequately provides for at least 5 valid radio altitude samples before issuing an RA or Traffic Advisory.

Requirement:

2.2.7.2.5.2.3 Monitor Verification of Radio Altitude Source Prior to Issuance of Traffic or Resolution Advisories

In the event of a power off/on system reset, the Monitor shall verify that a radio altitude source has provided data for five consecutive TCAS processing cycles without a failure indication (see also subparagraph 2.2.7.2.5.2.5) prior to allowing TCAS to issue either Traffic or Resolution Advisories. It is required that such a verification be performed even when TCAS is in the Standby mode of operation. If such verification cannot be achieved within the ten TCAS processing cycles immediately following a power off/on system reset, the Monitor shall declare a TCAS failure.

Industry:

The proposed validation method has been used in over 10,000 certified TCAS systems since the introduction of the requirement as part of ACAS or TCAS change 7.0 for over 10 years with No reported issues.

A TCAS Processing cycle is defined as a 1 second period. Therefore, this requirement is interpreted to mean that 5 seconds of consecutive valid radio altitude inputs (at a minimum of 1 sample per second) is required to be received before radio altitude is declared valid. The primary purpose of this requirement is to prevent a TCAS issuing an

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[1] Cf. EASA Web: http://www.easa.europa.eu/ws_prod/g/doc/About_EASA/Manag_Board/2004/mb_decision_0704.pdf

advisory before it has adequately determined that it has sufficient altitude above the ground to annunciate advisories or to annunciate descend advisories.

The proposed system insures that radio altitude is valid before issuing a resolution advisory after a power on/off system reset. The system samples radio altitude 10 times per second. Therefore, in one second the system has more samples than the assumed “model” for TCAS processing in the MOPS in 5 seconds (only 5 samples). Therefore, in a shorter time it achieves an equivalent level of confidence in the radio altitude status. The system will not issue Traffic Advisories or Resolution Advisories if at power on/off the Radio Altimeter source is invalid.

EASA:

We accept the deviation as the proposed mitigation is meeting the intent of the requirement.

ETSO-C119c#9 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.7.2.5.1 and set the system into TCAS standby after 6 consecutive processing cycles of non-credible pressure altitude instead of failing the system after 5 consecutive TCAS processing cycles.

Requirement:

2.2.7.2.5.1 Barometric Altitude Monitoring

Note: The Collision Avoidance System (CAS) logic determines credibility of the barometric altitude source. The determined credibility will be either "credible" or "not credible".

Each TCAS processing cycle, the CAS logic will provide the Monitor with the status of own aircraft’s barometric altitude source credibility. The Monitor shall declare a TCAS failure when this status has been "not credible" for five consecutive TCAS processing cycles. Unless this status has been "not credible" for five consecutive TCAS processing cycles, the Monitor shall not declare a failure.

Industry:

This deviation has been previously certified and fielded into over 10,000 systems with the introduction of ACAS / TCAS Change 7.0 (2000)

A TCAS processing cycle is the same as a 1 second processing cycle.

The TCAS monitor is required to fail the system if the pressure altitude input is non-credible for five consecutive seconds.

The system will place the TCAS into Standby (equivalent to a TCAS system failure) after the pressure altitude has been non-credible for 6 consecutive seconds and in which the last 3 seconds the pressure altitude filter (which checks for credibility) has attempted to reinitialize its tracker.

Rationale

The purpose of this deviation is to attempt to prevent nuisance “failures” in the cockpit. The algorithm defined in the MOPS to check for credibility provides for no re-initialization. Allowing the altitude filter to reinitialize after 3 consecutive seconds of non-credible data for an additional 3 seconds should significantly reduce nuisance failures. The algorithm meets the spirit and intent of the MOPS requirement. Altitude faults, such as loss of data or failed data, are indicated with a standard TCAS system failure. Transition to TCAS standby is used only for the short term credibility monitor for extreme accelerations or rates. Setting TCAS to standby is one accepted method to showing that the TCAS is not available. It is the same annunciation that is shown when the pilot selects “ATC Off” or “Alt Off” on the transponder control panel. The system automatically reconfigures to the normal / selected operating mode once the altitude passes the required credibility monitoring.

Going to TCAS standby instead of annunciating TCAS fail is also seen as operationally beneficial because it prevents unnecessary removals of TCAS as follow on maintenance action to the failure indication.

EASA:

We accept using 6 instead of the required 5 seconds to initiate a resulting action, in case the additional filtering is able to reduce the nuisance alarms.

Based on the existing approved installations we accept as well on the equipment level to annunciate the TCAS unavailability as follow on action resulting from missing altitude information by going into the standby mode. As condition to accept the deviation we demand that the operating instructions describe clearly the behaviour to allow proper pilot awareness.

It is expected that the resulting failure annunciation is only a transient condition, as it is expected that the altitude information, even if wrong or corrupted, will establish again at a certain value, which will be considered valid again by the filter as it is not expected to maintain extreme accelerations or rates for longer periods.

ETSO-C119c#10 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.3.12 and use power dependent suppression times.

Requirement:

2.2.3.12 Aircraft Suppression Bus

The TCAS II equipment shall issue a 70 ±1 microseconds suppression pulse to other on-board aircraft equipment beginning at each interrogation transmitted from the top-mounted antenna. The TCAS II equipment shall issue a 90 ±1 microseconds suppression pulse to other equipment for each interrogation from the bottom antenna.

The TCAS II equipment shall be designed to accept and respond to interference suppression pulses from other electronic equipment in the aircraft (to disable it while the other equipment is transmitting). The TCAS equipment shall regain normal sensitivity, within 3 dB, not later than 15 microseconds after the end of the applied interference suppression pulse.

Note: The suppression duration must be longer than the interrogation to ensure the on-board transponder does not respond to reflections of the TCAS II interrogations from the ground. The durations specified above have been determined experimentally to be adequate for this purpose. This document does not establish the design parameters of the interference suppression system other than the durations. However, it is recommend that all sources of interference suppression pulses be DC coupled and sinks be AC coupled. This standardization will prevent source or sink failures from disabling all users of the interference suppression pulses.

Industry:

Use of variable suppression times for Air Traffic Control Radar Beacon System ATCRBS (transponder) and Mode-S interrogations is based on interrogation power and antenna. An algorithm for determining suppression times is given below:

T = maximum of [(Tmax * 10 (APT/20)) or 30]

where:

T = suppression time in microseconds

Tmax = 70 microseconds for top antenna transmissions

= 90 microseconds for bottom antenna transmissions.

APT = power transmitted relative to the maximum power out in db

The suppression time is varied based on interrogation power to reduce the amount of time that own transponder is suppressed from transmitting. Having a fixed suppression time for all interrogations causes excessive, unnecessary own transponder off time during low power interrogations.

The following table defines the suppression time for each antenna as a function of the power attenuation from nominal (54 dBm). The values apply to both short and long Mode-S transmissions as well as Mode-C transmissions. Long Mode-S interrogations are performed at full power so the suppression time uses the 0 reduction column of the table.

EPR Reduction relative to full power (dB)	0	1	2	3	4	5	6	7	8	9	>9
Suppression time for Top antenna (usec)	70	60	55	50	45	40	35	30	30	30	30
Suppression time for Bottom antenna (usec)	90	80	70	60	55	50	45	40	35	30	30

The table below provides the total duration of TCAS UF=0 and Mode C transmissions.

Transmission	Duratioin (μsec)
Mode S UF=0	21
Mode S UF=16	35
Mode C (not including S1)	23

EASA:

We accept the deviation providing sufficient protection time for other on board systems and takes into account that the multi-path effects, which could potentially lead to interference after having finished the transmission, are transmitting power dependent.

ETSO-C119c#11 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.5.4.1.1, 2.2.4.5.4.1.2 and suppress the S1 pulse on the two lowest power interrogations in a whisper-shout sequence.

Requirement:

Note to figure 2.7: In the last steps of each quadrant no S1 pulses are transmitted.

Industry:

The system does not transmit an S1 on the two lowest power interrogations in a whisper-shout sequence.

Rationale

By eliminating the S1 pulse on the two lowest power interrogations instead of the lowest power interrogations the system increases the likelihood of acquiring in-close Air Traffic Control Radar Beacon System ATCRBS (transponder) equipped aircraft. The purpose of the S1 pulse is to prevent closer intruders from replying and overlapping replies of longer range intruders.

The Minimum Operational Performance Standard (MOPS) requires that the S1 pulse not be included in the lowest power interrogation to make sure that all “in close” ATCRBS transponder equipped intruders reply. Eliminating S1 on the first two low power interrogations increases the likelihood that the system will receive two replies from different whisper shout interrogations from in-close intruders.

EASA:

We accept the deviation.

ETSO-C119c#12 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.5.4.1.1, 2.2.4.5.4.1.2 and use a whisper-shout interrogation sequence for a bottom directional antenna with ten total interrogation steps.

Requirement:

A sequence is provided for a bottom omni-directional antenna only.

Industry:

This whisper-shout interrogation design has been employed in over 15,000 previously certified TCAS since 1990.

The Minimum Operational Performance Standard (MOPS) does not specify a whisper-shout interrogation sequence for a bottom directional antenna, but only for a bottom omni-directional blade antenna.

The system employs a bottom directional antenna instead of the MOPS specified omni-directional blade antenna. As a result, the whisper-shout sequence is different to accommodate the different antenna characteristic.

Use of a bottom directional antenna is accepted as an industry standard. The additional interrogations are accounted for appropriately in the interference limiting equations so that the channel load is controlled. For an Air Traffic Control Radar Beacon System (ATCRBS) transponder equipped aircraft density of 0.01 aircraft per square Nmi the additional Mode C interrogations is estimated to elicit less than 1 additional reply.

EASA:

We accept the deviation adopting the requirements for a directional bottom antenna. Using a directional antenna is expected to generate a more stable communication at lower power levels.

ETSO-C119c#13 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.5.4.1.2 and use a 14 step instead of a 4 step whisper-shout interrogation sequence for a bottom omni-directional antenna.

Requirement:

A 4 step whisper-shout interrogation sequence is requested for the omni-directional bottom antenna.

Industry:

This whisper-shout interrogation design has been employed in over 15,000 previously certified TCAS since 1990.

The additional interrogation steps provide for more complete coverage on the lower antenna. The additional steps also reduce the probability that another aircraft below own aircraft, which is shadowed from own aircraft's top antenna, will not be tracked. The additional interrogations are accounted for in the interference limiting equations so that the channel load is controlled. For an Air Traffic Control Radar Beacon System ATCRBS transponder equipped aircraft density of 0.01 aircraft per square Nmi less the additional Mode C interrogations is estimated to elicit less than 1 additional reply.

EASA:

We accept the deviation as the visibility of Mode C equipped aircraft is increased.

ETSO-C119c#14 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.6.2.2.2 and establish a track after three consecutive and consistent replies instead of only two consecutive replies.

Requirement:

2.2.4.6.2.2.2 …

When two replies have been received (which may include the acquisition reply) that are within 500 ft of each other, have identical Q-bit values and have the correct ICAO aircraft address, the track is considered established and periodic surveillance interrogations shall be initiated for that target according to 2.2.4.6.2.2.3. …

Industry:

This Mode S track initiation design has been employed in over 15,000 previously certified TCAS since 1990.

The proposed system establishes a Mode-S track after three replies.

The third reply allows the system to form a more stable track. This deviation does not prevent the system from meeting the basic requirement. It meets the basic requirement to place an intruder into track with adequate time to declare an advisory. Analysis of the required Mode S surveillance flight tests in high density Mode S areas (such as JFK) over the previous 20 years has shown that systems requiring the 3rd reply still meet the 99% flight test tracking reliability requirements of the MOPS.

EASA:
We accept the deviation, as three consecutive replies to allow a better tracking initialisation. As condition to accept such deviation, we ask industry providing evidence that the tracking capability is still met.

ETSO-C119c#15 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.6.2.2.1 and interrogate a Mode-S transponder after receipt of only one valid, error free squitter.

Requirement:

2.2.4.6.2.2.1 …

To reduce the number of unnecessary interrogations, no interrogations shall be transmitted to a target if so few squitters and altitude replies are received from it to indicate an unreliable RF link. …

Industry:

This aspect of Mode S track acquisition has been employed in over 15,000 previously certified TCAS since 1990.

The system interrogates a Mode-S transponder after receipt of one valid, error free squitter.

This deviation allows the system to quickly determine if an aircraft is a threat and begin monitoring it from receipt of the first squitter. It allows for faster acquisition of pop-up Mode-S aircraft. In addition, because the system assumes the message was encoded with a Parity Identity (PI) code of zero and error detection and correction algorithms, it has high confidence in the Mode-S address contained within the squitter and the acquisition interrogations on that squitter will not be wasted. These acquisition interrogations, as required, are included in the interrogation power sums of the MOPS specified interference limiting algorithms. Additionally, the algorithms similar to those in section A.8 of EUROCAE ED-143/RTCA DO-185B are employed to prevent the system from over-interrogating a target that consistently fails to acquisition interrogations.

EASA:
We agree to the requested deviation. Using each received aircraft address on the calling list is an agreeable conservative approach when the suggested means to stop interrogations in case the communication cannot be established are implemented as well. EASA recommends using this deviation only in combination with the implementation of Hybrid Surveillance.

ETSO-C119c#16 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.4.1.1 and allow a Minimum Trigger Level (MTL) of -77dBm instead of -74dBm but raises the MTL to -73dBm when the interference limiting inequalities are initially violated.

Requirement:

2.2.4.4.1.1 Given a valid transponder reply signal in the absence of interference or overloads, the minimum trigger level (MTL) is defined as the minimum input power level that results in a 90% ratio of decoded to received replies.

a. The MTL for ATCRBS and Mode S signals over the frequency range of 1087 to 1093 MHz shall be -74 dBm ±2 dB.

Note: This provides adequate link margin for reliable detection of near-co-altitude aircraft in level flight at a range of 14 NM

b. For an input signal power of level -78 dBm or less, no more than 10% of ATCRBS and Mode S signals shall be decoded.

c. The decoding ratio shall be at least 99% for ATCRBS and Mode S signals between MTL +3 dB and -21 dBm.

Industry:

This enhancement of Mode S surveillance been employed in approximately 15,000 previously certified TCAS since 1990.

This deviation allows for increased probability detection and tracking of Mode-S equipped aircraft.

In all cases the system does not exceed the channel load limits specified by DO-185B section 2.2.3.6 through the request load generation limitation function.

The system design insures that in the presence of conditions that trigger interference limiting (i.e. that might exceed the TCAS channel load budget), will present no more load than a TCAS without this deviation

The MTL is raised to -73 dBm when the channel load limits are first met. The TCAS maintains the – 73 dBm MTL for 8 seconds (as recommended by DO-185B section 2.2.3.6.2). It will then raise or lower the MTL as recommended and specified in section 2.2.3.6.2. By transitioning to –73 dBm any time the interference limiting inequalities are violated ensures that the system, in the presence of conditions that trigger interference limiting (i.e. that might exceed the TCAS channel load budget), will present no more load than a TCAS without this deviation.

Analysis of ACAS recorded data of flights over Europe has shown that the number of additional ACAS elicited replies attributable to this function were less 0.1 replies per second. This analysis included approximately 9 hours of data from 6 flights in areas where the channel load limits (interference limiting) would normally not be invoked insuring that the TCAS was functioning with this surveillance improvement enabled.

The system includes Hybrid Surveillance per RTCA/DO-300. This reduces the interrogation channel load. Hybrid Surveillance accomplishes this by two methods:

- Interrogating “non threat” aircraft at reduced rates of either once every 10 seconds or 60 seconds, instead of either every 1 second or 5 seconds as required by RTCA/DO-185B.

- Completely eliminating interrogations to aircraft with ADS-B reports indicating altitudes outside of +/- 10,000 feet of own aircraft altitude. Per RTCA/DO-185B these aircraft can be interrogated once every 10 seconds.

RTCA SC147 SWG conducted simulations, which show that DO-300 Hybrid surveillance reduces TCAS induced 1090 MHz interference by 25% to 35% in a high traffic density scenario (JFK) compared to a TCAS compliant with RTCA/DO-185B.

EASA:
We accept the proposed deviation but strongly recommended implementing it only together with Hybrid Surveillance. We clearly see the benefit to acquire aircraft at greater range. Especially in combination with Hybrid Surveillance, this will allow earlier verification of the received ADS-B signals through the internal tracker. In areas with high aircraft density, the system will automatically not interrogate the far away aircraft due to the interference limiting algorithm. That will keep the channel load at adequate levels and increase it only in areas with low aircraft density where channel load is no problem.

ETSO-C119c#17 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.4.1.1 and allow reduction of the minimum trigger level (MTL) in the forward quadrant to -82 dBm for squitter listening and -84 dBm for tracking interrogations instead of -74 dBm.

Requirement:

2.2.4.4.1.1 Given a valid transponder reply signal in the absence of interference or overloads, the minimum trigger level (MTL) is defined as the minimum input power level that results in a 90% ratio of decoded to received replies.

a. The MTL for ATCRBS and Mode S signals over the frequency range of 1087 to 1093 MHz shall be -74 dBm ±2 dB.

Note: This provides adequate link margin for reliable detection of near-co-altitude aircraft in level flight at a range of 14 NM

b. For an input signal power of level -78 dBm or less, no more than 10% of ATCRBS and Mode S signals shall be decoded.

c. The decoding ratio shall be at least 99% for ATCRBS and Mode S signals between MTL +3 dB and -21 dBm.

Industry:

This improvement in the system extends the range of the existing TCAS Mode S surveillance in the forward direction and enhances pilot situational awareness in certain limited situations.

This enhancement of Mode S surveillance been employed in approximately 3,000 previously certified TCAS since 2004.

The system under certain specific and limiting conditions further reduces Mode S MTL in the forward quadrant to -82 dBm for acquisition and -84 dBm for tracking.

The channel load limit (interference limiting) imposed by DO-185B is never exceeded with the implementation of this Mode S surveillance improvement. The system is designed in such a way as there is no additional channel load in areas where the channel load limits specified by DO-185B section 2.2.3.6 would be normally invoked. In other words, the feature is disabled in areas of high traffic density. Additionally, a more restrictive channel load limit (interference limiting limit) must be satisfied before acquisition of tracks for this improved surveillance feature is permitted.

Analysis of ACAS recorded data of flights over Europe has shown that the number of additional ACAS elicited replies attributable to this function were less 0.1 replies per second. This analysis included approximately 9 hours of data from 6 flights in areas where the channel load limits (interference limiting) would normally not be invoked insuring that the TCAS was functioning with this surveillance improvement enabled.

The design of this extension insures that standard TCAS surveillance range is not impacted.

Specifically, the design of this enhancement has the following characteristics

It is only performed in "lower" density airspace when own aircraft is above 18,000 feet.

Tracking interrogations of aircraft visible only at the lower MTL are limited so that they do not trigger premature invocation of the interference limiting procedures defined in RTCA/DO-185B.

Aircraft visible using the standard MTL will be tracked before attempts to track aircraft at longer ranges which are only visible at the extended MTL.

It is only used against aircraft in the forward direction or beam of the TCAS.

EASA:

We understand that the deviation is providing a better tracking range in the forward direction and is limited to operations above 18,000 feet in low aircraft density areas. We accept that deviation and recommend implementing it only in combination with Hybrid Surveillance functionality.

ETSO-C119c#18 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B Volume I Section 2.2.4.5.4.1.3 and Volume II Sections 2.1.17, 2.1.18, 3.57, 3.104, Appendix A and allow the altitude tracker to limit the credibility checks to 0.5 g (16 feet/sec^2) instead of 1.25 g (40 feet/sec^2) vertical accelerations under certain conditions.

Industry:

This deviation has been employed in approximately 10,000 previously certified TCAS since 2000.
In cases were the Minimum Operational Performance Standard (MOPS) defined vertical tracker defined for use by the collision avoidance logic is also used by surveillance additional modification of the tracker is desirable The vertical tracker changes defined in RTCA SC147 Change Proposal 98 (CP98) increased the credibility checks to allow high vertical acceleration. CP98 was not part of RTCA/DO-185A (TCAS change 7.0, ACAS) but was incorporated into RTCA/DO-185B. The changes for CP98 are summarized as:

1. Macro VT_Credible_Report(T,DZM,TSTART,TDAT,ZD,QUANT)
    a. Change 20 ft/s to 30 ft/s
    b. Change 8 ft/s/s to 20 ft/s/s
2. CREDACCDIV
    a. Change 8 ft/s/s to 20 ft/s/s
    b. This variable is defined as the credible acceleration divided by 2.

Industry has an issue with CP98 solution because the systems use the MOPS defined altitude tracker for collision avoidance tracking as well as intruder tracking. As a result of the MOPS change in the collision avoidance tracker, the surveillance system was indirectly modified. Negative impact to surveillance of Mode-C (non Mode-S) equipped aircraft in very dense airspace was verified. This was verified through reprocessing of MOPS required LA Basin Flight Tests were reprocessed through the modified altitude trackers. The changes resulted in degradation of tracking reliability below the required 95% tracking reliability requirement of the MOPS LA Basin Flight Test.

The issue was that in a very dense Mode-C environment, it is more likely to miscorrelate the reply of one intruder with another – especially since the Mode-C transponders do not have a Mode-S address to eliminate all possibilities of miscorrelation. The new tracker had larger "credibility" windows and accepted altitude reports which previously were rejected by the "credibility" windows of the tracker defined in RTCA/DO-185A.

In order to resolve this issue the altitude tracker was modified to use two sets of credibility windows:

- Window "a" matches what is defined in RTCA/DO-185A. This window handles vertical accelerations up to approximately 0.5 g.
- Window "b" matches what is defined in RTCA/DO-185B. This window handles vertical accelerations up to approximately 1.25 g.

The system attempt to select Window "a" only when the conditions merit it, otherwise the

recommended Window "b' is used. The following conditions must be true for Window "a" to be selected:

1. The Intruder is Air Traffic Control Radar Beacon System (ATCRBS – transponder) equipped AND
2. The Intruder's altitude is less than 5,000 ft AND
3. Own aircraft altitude is less than 10,000 ft AND

Reply statistics indicate that the beam in which the intruder is being tracked has a high chance of being "crowded" as indicated by the MOPS defined Low Confidence Flag. See RTCA/DO-185B Section 2.2.4.5.4.1.3 – Determination of Whisper-Shout Based on Synchronous Garble.

These new changes (larger altitude credibility windows) are not an issue in non-dense ATCRBS airspace or with Mode S equipped aircraft. The possibilities of correlating the incorrect altitude in non-dense airspace or with a Mode-S equipped intruder are low (basically zero). Therefore, the bigger altitude credibility windows have no negative impact and allow the TCAS to track aircraft performing high-g vertical accelerations. However, in dense areas such as the LA Basin the new tracker negatively affected surveillance performance. Selecting the credibility windows under the restricted conditions with the above analysis indicates that surveillance performance in the LA Basin will continue to meet the MOPS tracking reliability requirements.

EASA:
EASA agrees to the requested deviation.