

Sektion 2. Utlandstillverkad flygmateriel

Denna LVD har utfärdats för att omfatta alla de nationella luftfartyg som inte regleras av EASA utan av det svenska regelverket, Transportstyrelsens Författningssamling TSFS.

TITEL:	Upphävning av Kontroll av Mode C och Mode S transpondersystem.
GÄLLER:	Alla luftfartyg med Mode S eller Mode C transponder som använder "Gilham code" som insignal för höjdinformation.
REVISION:	Revision1 har blivit utgiven på grund av utfärdandet av EASA AD 2006-0265-CN som upphäver EASA AD 2006-0265.
ÅTGÄRD:	Ingen åtgärd krävs enligt bifogad EASA AD 2006-0265-CN. Refererad AD och SIB No 2011-15R1 med mer information finns även tillgänglig på följande internetadress: http://ad.easa.europa.eu/
TID FÖR ÅTGÄRD:	Ingen åtgärd krävs.
UNDERLAG:	EASA AD 2006-0265-CN
REFERENS:	EASA AD 2006-0265-CN
BESLUTSDATUM:	24 april 2013
BESLUT:	TSL 2013-2400

Åtgärder enligt LVD utgör nödvändig förutsättning för ifrågavarande flygmateriels luftvärdighet. Referens TSFS 2012:83.
Anteckning om åtgärd, som vidtagits i enlighet med LVD, skall införas i teknisk journal för berörd flygmateriel med hänvisning till ifrågavarande LVD-nummer. Angivet underlag refererar till senast gällande revision/utgåva.

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EASA	AIRWORTHINESS DIRECTIVE CANCELLATION NOTICE	
	AD No.: 2006-0265-CN Date: 17 April 2013 Note: This Airworthiness Directive (PAD) Cancellation Notice (CN) is issued by EASA, acting in accordance with Regulation (EC) No 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation.	
Design Approval Holder's Name: VARIOUS (see Applicability below)		Type/Model designation(s): Mode 'C' and Mode 'S' Transponders
ETSO Authorisations: Various		
Foreign AD: None		
Cancellation: This Notice cancels EASA AD 2006-0265 dated 30 August 2006, which superseded CAA United Kingdom AD 002-12-99 Rev.2, as well as any corresponding EU Member State ADs that were issued in response to that AD.		
ATA 34	CANCELLED: Navigation Systems – Mode S and C Transponders – Check	
Manufacturer(s): Various, see Applicability		
Applicability:	Mode 'C' and Mode 'S' transponders, all types and models utilising Gilham code altitude input. Such transponders are known to have been manufactured by, but not limited to, Aviation Communication & Surveillance Systems (ACSS), Becker Flugfunkwerk GmbH, Funkwerk Avionics GmbH (formerly Filser Electronic GmbH), Garmin International Inc., Garrecht Avionik GmbH, Honeywell International Inc. (formerly Allied Signal, Bendix-King), Rockwell Collins Inc. and Trig Avionics Ltd. The affected transponders are known to be installed on, but not limited to, JAR/FAR/CS 23 and 25 aeroplanes equipped with Traffic Alert and Collision Avoidance System (TCAS).	
Reason:	During the 1990's, the FAA received reports of eleven incidents involving certain transport category airplanes equipped with Mode "C" transponder(s) with single Gilham code altitude input. These reports indicated that, during level flight, the TCAS II issued false advisories that directed the flight crew to either climb or descend. Further investigation showed that these events were caused by incorrect Gilham coded altitude input. The instances reported in the USA all involved communication between aeroplanes with the TCAS II and aeroplanes having the Mode "C" transponder(s). Aeroplanes having Mode "C" transponders installed are predominantly older, out-of-production transport category (JAR/FAR/CS 25) aeroplanes. Such inaccurate altitude reporting and consequent false TCAS II advisories, if not prevented, could cause the flight crew to manoeuvre the aeroplane from its	

	<p>assigned flight path, possibly resulting in a mid-air collision.</p> <p>To address this potential unsafe condition, on 12 November 1999, FAA issued AD 99-23-22 to require repetitive testing of the affected transponders. This AD was later revised (R1 dated 16 December 1999) and subsequently cancelled (rescinded) by AD 99-23-22R2 on 20 April 2000. The reason to rescind that AD were that test data had been collected that demonstrated that the repetitive tests are unnecessary.</p> <p>Prompted by the original FAA AD 99-23-22 and some similar reported occurrences in the United Kingdom (UK), the CAA UK issued AD 002-12-99 (later revised twice), which was made applicable to a much wider range of aircraft, i.e. not restricted to aircraft with TCAS installed and also applicable to aircraft fitted with Mode "S" transponders, if using Gilham code altitude input.</p> <p>In 2006, EASA adopted the CAA UK requirements as EASA AD 2006-0265 to require the identification of incorrect transmission of altitude data from transponders which utilise Gilham coded altitude encoders as a sensor input and, where aircraft transponders accept dual Gilham coded altitude encoders, the transponder altitude data comparator must be checked for correct operation. That AD had been published as PAD 06-170 for consultation on 07 August 2006 with a comment period until 21 August 2006 and no comments were received during the consultation period.</p> <p>Since that AD was issued, many comments have been received on the impact of the repetitive requirements, particularly on general aviation (JAR/FAR/CS 23) aeroplanes. These comments together with the comments received during the consultation process confirm the conclusion of the FAA that the repetitive tests, relating to the Gilham code altitude input, are no longer necessary to ensure safe operation. Although Maintenance Organisations reported problems with the altimetry systems of aircraft affected by EASA AD 2006-0265, many of these problems related to failures which were not associated with the Gilham code altitude input. To account for these, non Gilham related transponder problems, EASA has decided to update SIB 2011-15 to include a check of Mode C transponder systems (note: previously this SIB was only applicable to Mode S Transponder Systems). The revised SIB recommends a test interval of 24 months, which is the same time interval as contained in EASA AD 2006-0265.</p> <p>In addition, the European Commission has recently published Implementing Regulation (EU) No. 1207/2011 which contains the requirements for the performance and interoperability of surveillance for the Single European Sky, which includes mandated repetitive testing of transponders. This regulation only applies to aeroplanes with a take-off mass exceeding 5 700 kilograms.</p> <p>After review of all available information and for the reasons described above, this Notice cancels EASA AD 2006-0265. At the same time, Safety Information Bulletin (SIB) 2011-15R1 is published to recommend certain actions for general aviation aeroplanes and helicopters that still have the affected transponders installed, but who do not have to comply with European Commission Implementing Regulation (EU) No. 1207/2011.</p>
Effective Date:	17 April 2013
Required Action(s) and Compliance Time(s):	None
Ref. Publications:	None.
Remarks:	1. This AD-CN was posted on 21 August 2012 as PAD 12-109-CN for consultation until 31 October 2012. The Comment Response Document can be found at http://ad.easa.europa.eu .

	<ol style="list-style-type: none">2. Enquiries regarding this AD-CN should be referred to the Safety Information Section, Executive Directorate, EASA. E-mail: ADs@easa.europa.eu.3. For any question concerning the technical content of this AD-CN, please contact the ETSOA holder of your transponder, or the type certificate holder of your aeroplane.
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EASA Safety Information Bulletin

SIB No.: 2011-15R1

Issued: 17 April 2013

Subject: Mode S and Mode C Transponder Systems: Ground Testing

Ref. Publications: None.

Applicability: All owners and operators of aircraft having Secondary Surveillance Radar (SSR) **Mode S** transponder or SSR **Mode C** transponder systems installed.

Mode S transponder systems and Mode C transponder systems are known to be installed on, but not limited to, aircraft certificated under (FAR, JAR, CS) Part 22, 23, 25, 27, 29, 31HB, VLA or VLR.

Description: Accurate and reliable surveillance information (including altitude reporting) and aircraft and/or flight data, transmitted by Mode S and Mode C transponder systems when the aircraft is in flight and on the ground, is crucial for the safe and smooth operation of today's air traffic management environment.

At this time, the airworthiness concern described in this SIB is not considered to be an unsafe condition that would warrant Airworthiness Directive (AD) action under Commission Regulation [EU 748/2012](#), Part 21.A.3B.

This SIB is revised to include a reference to Mode C transponder systems and is concurrent with the cancellation of EASA AD 2006-0265.

Note: AD 2006-0265 applied to Mode C and Mode S Transponder Systems, utilising Gilham code altitude input. This AD was cancelled based on the low number of reports, concerning incorrect altitude indication, due to Gilham code wiring problems.

Nevertheless, incorrect or missing data can lead to an increase in controller and/or flight crew workload, which could develop into a potentially hazardous situation. Some examples have been published in [EASA SIB 2011-13](#) - Mode S Transponder: Loss of Detection (Complete or Intermittent) of Aircraft by Mode S Interrogators, and [EASA SIB 2011-14](#) - Mode S Transponder: Incorrect Setting of ICAO 24-Bit Aircraft Address.

This is information only. Recommendations are not mandatory.

Recommendations: If you become aware, or are notified, of a transponder system deficiency affecting your aircraft, EASA recommends that you initiate an unscheduled maintenance action to arrange for any deficiencies to be corrected, at the earliest opportunity.

To ensure that the notifying authority can track the resolution of such issues, it is highly recommended that operators/owners promptly advise the notifying authority of any rectification action.

In order to ensure acceptable transponder system performance, EASA recommends that the correct operation of installed **Mode C or Mode S transponder systems is verified periodically (the interval most frequently used in the past was 24 months)**, using appropriate (and calibrated) ramp testing equipment in accordance with applicable maintenance manual procedures.

1. **For Mode S equipped aircraft**, testing for correct functionality should include the following items (where applicable):

- The Mode S 24-Bit aircraft address
- Altitude reporting including the check of the altitude sensor at adequate intervals from ground to the certified altitude ceiling of the aircraft.
- Mode S Elementary Surveillance (ELS) & Downlink Aircraft Parameters (DAPs):
 - Aircraft Identification
 - Capability Report
 - Pressure Altitude
 - Flight Status
- Mode S Enhanced Surveillance (EHS) & Downlink Aircraft Parameters (DAPs)
 - Magnetic Heading
 - Indicated Airspeed
 - Mach No.
 - Vertical rate
 - Roll Angle
 - Track Angle Rate or True Airspeed
 - True Track Angle
 - Ground Speed
 - Selected Altitude (and Barometric Pressure Setting where appropriate)

This is information only. Recommendations are not mandatory.

2. For Mode C equipped aircraft, testing for correct functionality should include the following items:

- Correct operation of the Mode A code
- Altitude reporting including the check of the altitude sensor at adequate intervals from ground to the certified altitude ceiling of the aircraft.

3. For Mode C or Mode S equipped aircraft utilising Gilham Code (sometimes referred to as Grey code) to provide altitude input to the transponder the testing for correct functionality should include the following items:

- (1) Connect an air data test set to the No. 1 and No. 2 (where applicable) Pitot/Static system.
- (2) In the aircraft flight deck/cockpit, select the No. 1 Mode 'C' or Mode 'S' transponder (as applicable) and select Air Data source No. 1.
- (3) Select the air data test set to the following altitude reporting values:
 - 1 000 feet;
 - 4 100 feet;
 - 15 700 feet; and
 - 31 000 feet
- (4) For each selected altitude, verify that the Mode 'C' or Mode 'S' transponder (as applicable) altitude reporting is within tolerance (± 125 feet), and record the altitude as follows:
 - 1 000 feet = Actual reading (± 125 feet)
 - 4 100 feet = Actual reading (± 125 feet)
 - 15 700 feet = Actual reading (± 125 feet)
 - 31 000 feet = Actual reading (± 125 feet)
- (5) In the aircraft flight deck/cockpit, select Air Data source No. 2 (if applicable) and repeat items (3) and (4) above.
- (6) In the aircraft flight deck/cockpit, select the No. 2 Mode 'C' or Mode 'S' transponder (if applicable) and select Air Data source No. 1 and repeat items (3) and (4) above.
- (7) In the aircraft flight deck/cockpit, select Air Data source No. 2 (if applicable) and repeat items (3) and (4) above.
- (8) Where aircraft have the availability of a third air data source, that provides altitude data to the transponder system, then repeat items (3) and (4) above, for No. 1 and/or No.2 Mode C or Mode S transponder systems connected to Air Data source No. 3.
- (9) Confirm by inspection and reference to aircraft and equipment Maintenance Manuals and Wiring Diagrams, that, where dual Air Data sources are used, the transponder

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altitude data comparator function is enabled. Using appropriate test equipment, demonstrate that the comparator detects altitude data differences between the dual encoders of more than 600 feet.

If the comparator function is not enabled or is unserviceable, rectify before further flight (this requirement is only applicable to aircraft which utilise dual Air Data sources). Note: The comparator function is only available when Mode S transponders are installed.

Note 1: Care should be taken, not to disturb the operation of ATC or other aircraft when performing any transponder (or ACAS) related tests. Guidance for the ground testing of transponders can be found in Appendix 1 of this SIB.

Note 2: In case the ramp test equipment indicates an error with the transmission of the data as specified above, or indicates any other type of failure (e.g. out of frequency, power etc), the problem should be corrected prior to the next flight.

Note 3: Detailed information on EHS DAP's may be found in EASA AMC 20-13 - Certification of Mode S Transponder Systems for Enhanced Surveillance.

Note 4: For aircraft which do not provide a full set of DAP's, the testing may be limited to only those declared in their Aircraft Flight Manual.

Note 5: These recommendations do not apply if the aircraft maintenance manual or transponder equipment manufacturer specifically states that periodic testing is not required due to other mitigation means available to detect failures of the transponder system.

Contacts:

For further information contact the Safety Information Section, Executive Directorate, EASA; E-mail: ADs@easa.europa.eu.

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Appendix 1 - Transponder Ground Testing Guidance

- a. When not required, ensure all transponders are selected to 'OFF' or 'Standby'.
- b. Before starting any test, contact the local Air Traffic Control Unit and advise them of your intention to conduct transponder testing. Advise the Air Traffic Unit of your start time and test duration. Also inform them of the altitude(s) at which you will be testing, your intended Aircraft Identification (Flight Id) and your intended Mode A code. See para c and d. Note: Certain altitudes may not be possible due to over flying aircraft.
- c. Set the Mode A code to 7776 (or other Mode A code agreed with Air Traffic Control Unit). *Note: The Mode A code 7776 is assigned as a test code by the ORCAM Users Group, specifically for the testing of transponders.*
- d. For Mode S equipped aircraft, set the Aircraft Identification (Flight Id) with the first 8 characters of the company name. This is the name of the company conducting the tests.
- e. For Mode S equipped aircraft, set the on-the-ground status for all Mode S replies, except when an airborne reply is required (e.g. for altitude testing).
- f. Where possible, perform the testing inside a hanger to take advantage of any shielding properties it may provide.
- g. As a precaution, use antenna transmission covers whether or not testing is performed inside or outside.
- h. When testing the altitude (Mode C or S) parameter, radiate directly into the ramp test set via the prescribed attenuator.
- i. In between testing, i.e. to transition from one altitude to another, select the transponder to 'standby' mode.
- j. If testing transponder parameters other than 'altitude', set altitude to -1000 feet (minus 1000 feet), or over 60000 feet. This will minimise the possibility of ACAS warning to airfield and overflying aircraft.
- k. When testing is complete select the transponder(s) to 'OFF' or 'Standby'.

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