



EASA Safety Information Bulletin

SIB No.: 2011-13

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Subject: **Mode S Transponder – Loss of Detection (Complete or Intermittent) of Aircraft by Mode S Interrogators**

Ref. Publications: [EASA SIB No: 2011-15](#) - Mode S Transponder: Ground Testing

Applicability: All owners and operators of aircraft having SSR Mode S transponders installed. Mode S transponders 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: The Mode-S Airborne Monitoring Project (AMP), which is coordinated by Eurocontrol, has identified a significant number of events involving aircraft equipped with certified Mode S SSR transponder installations, where complete or intermittent loss of detection by Mode-S SSR interrogators was experienced. Investigations have revealed that the majority of these occurrences were due to installation deficiencies, poor and/or incorrect maintenance practices, or individual equipment failures.

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 [EC 1702/2003](#), Part 21A.3B.

Nevertheless, a potentially hazardous situation can arise when a faulty SSR Mode S transponder does not respond correctly to SSR Mode S interrogations. Such interrogations can originate from Mode S ground stations and from other airborne aircraft, e.g. from an Airborne Collision Avoidance System (ACAS):

- An aircraft with a faulty Mode S transponder may not be 'visible', or may be 'visible' intermittently, to **Air Traffic Control (ATC)**. This compromises the provision of traffic separation and sequencing and could prevent or delay the application of avoiding action or the delivery of essential navigational assistance.

- An aircraft with a faulty Mode S transponder may not be 'visible', or may be 'visible' intermittently, to **aircraft operating ACAS** equipment. This degrades, or totally disables, the collision avoidance function, as no resolution advisory (RA) or traffic advisory (TA) alerts will be generated by the aircraft.

Recommendations: If you become aware, or are notified, of a transponder 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.

Guidance for the ground testing of transponders can be found in Appendix 1 of this SIB.

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

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. 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. 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'.