



## **Explanatory Note to Air Navigation Service Providers - EASA Airworthiness Directive (AD) 2008-0158:**

Reference: EASA C1 (2008)/D 76460

### **Introduction:**

AD 2008-0158 has been published by EASA in response to reports of intermittent non-detection of aircraft equipped with Funkwerk Avionics (formerly Filser Electronic) TRT600 and TRT800 series Mode-S transponders. The AD prohibits the operation of aircraft equipped with TRT600, TRT800, TRT800A or TRT800H transponders, in(to) airspace for which a transponder is required and Mode S interrogation is used by the ground system, unless prior acceptance from the Air Navigation Service Provider (ANSP) has been obtained.

This explanatory note is issued by EASA to provide more detailed information on the intermittent non-detection problem of aircraft equipped with the Funkwerk Avionics (Filser) TRT600 and TRT800 series Mode-S transponder. The aim of this note is to better enable the ANSPs to decide whether or not to accept an aircraft equipped with this type of transponder requesting entrance to radar controlled segments of their airspace. To achieve this, the National Aviation Authorities (NAAs) of ICAO Contracting States are requested to transmit this information to their respective ANSP(s).

### **Description of the problem:**

When the interrogative pattern of a Mode-S or a mixed mode Mode-A/C/S Secondary Surveillance Radar requires many replies in a very short period of time, the Funkwerk (Filser) TRT600 and TRT800 series transponder may, at times, fail to properly decode, or reply to, each or all of the interrogations. This problem is due to a misinterpretation, by the manufacturer, of EUROCAE ED-73B requirements and a problem with the power supply. However, the Funkwerk (Filser) TRT600 and TRT800 series Mode-S Transponders do reply correctly when interrogated by Secondary Surveillance Radars (SSR) which only operate in Mode A and C.

### **Impact on ANSP operations:**

As explained in the previous paragraph, the level of detection varies with the type of SSR, or combination of SSRs, in use by the ANSP in a certain airspace sector. In general, the TRT600 and TRT800 series transponders behaviour is as follows:

- If air traffic control relies on a Mode A/C only SSR, then there is no problem; the TRT600 and TRT800 series transponders will correctly reply to the interrogations and detection of the aircraft will be good.
- If air traffic control is based on interlacing of replies received by combinations of Mode A/C and Mode-S/Mixed-Mode A/C/S SSRs, one should consider that at times, the aircraft may only be detected by SSRs that only operate in Mode A/C.
- If air traffic control is reliant on the sole use of a pure Mode-S SSR, a Mixed- Mode-A/C/S SSR or a combination thereof, the TRT600 and TRT800 series transponders may not be able to correctly reply to the interrogations, and detection of the aircraft on SSR may be lost for prolonged periods of time. In one case, it was reported that an aircraft could not be detected by a Mode-S SSR for 17 minutes.

**Solution:**

Funkwerk Avionics GmbH, the manufacturer and design approval holder of the affected transponders, is actively developing solutions to address the anomaly. They have been able to considerably improve the behaviour of the transponders. Unfortunately, test flights performed with a prototype still identified some anomalies that need further investigation. Therefore, there is no modification available to correct all anomalies as of today. EASA is working with Funkwerk Avionics, to ensure that a satisfactory solution to the partial loss-of-detection problem is developed. Once a solution is available that meets all requirements, it is expected that EASA will take further AD action to ensure that all Funkwerk Avionics (Filser) TRT600 and TRT800 units are modified. Naturally, EASA will inform all NAAs of ICAO Contracting States when that decision is made.

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