

Subject: Loss of Transponder Reply**Ref. Publications:**

None.

Applicability:

Garrecht Avionik GmbH (trading as Air Avionics) Mode-S Secondary Surveillance Radar Transponders having the following Part Numbers:

- VT-0102-(xxx)-(xxx)-(xxx)-070 (Model VT-01),
- VT-0102-(xxx)-(xxx)-(xxx)-125 (Model VT-01),
- VT-0104-070 (Model VT-01, Ultra Compact),
- VT-0104-125 (Model VT-01, Ultra Compact),
- VT-0201 (Model VT-02 / VT-2000),

where (xxx) means any numerical sequence.

Description:

Some Radar Manufacturers and Air Navigation Service Providers have reported the loss of detection of aircraft equipped with the above-mentioned transponders.

It has been determined that for the affected transponders loss of detection occurs when the surveillance radar interrogates the transponders with Mode Interlace Patterns Mode S All-Call followed by Mode A/C interrogations (short and long P4) spaced by 110 μ s.

In addition, when there are two Mode S interrogations spaced by about 30 to 32 μ s, the probability of reply is also reduced below the minimum required by the applicable technical standards (EUROCAE ED-73).

In consequence:

- Acquisition of aircraft might be heavily affected for radars using inter-mode interrogations together with Mode S Only All-Call.
- Detection of aircraft is also affected for all radars when the transponder receives an inter-mode interrogation randomly from a different radar during the vulnerable period (36-121 μ s after the Mode S interrogation). This also affects Roll-Call interrogations therefore also Multilateration (MLAT) interrogations and TCAS II interrogations.

The root cause has been identified in an erroneous implementation of the Field Programmable Gate Array (FPGA) microcode firmware. Every FPGA microcode firmware version below or equal to 12 is affected by the problem described.

This is information only. Recommendations are not mandatory.



The version number of the FPGA microcode of all affected part numbers and serial numbers is electronically readable. How this information can be accessed depends on the human-machine interface (also known as 'control head' or 'steering unit') used to read the version number from the connected transponder. Appendix 1 of this SIB provides typical procedures to identify the installed FPGA microcode version.

All the affected transponders are capable of indicating whether the transponder currently replies to an interrogation or not. How this is indicated varies and depends on the human-machine interface ('control head' or 'steering unit') used for the transponder installation.

The reply indicator only indicates that the transponder replies to an interrogation, no matter which type it is. This may make non-compliantly absent replies difficult to detect by the flight crew.

The Design Approval Holder (DAH) - Garrecht Avionik GmbH plans to provide updated FPGA microcode to address the known deficiencies.

Once the updated FPGA microcode is available, the DAH plans to inform operators of the affected equipment on the exact procedures on how to update the FPGA microcode.

This SIB is published to raise awareness for possible loss of detection of aircraft using transponders listed in the Applicability of this SIB and to provide maintenance and operational recommendations.

At this time, the safety 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.

Recommendation(s):

EASA recommends operators and maintenance organizations of aircraft equipped with any transponder listed in the Applicability of this SIB to monitor corrective actions issued by Garrecht Avionik GmbH and to implement those corrective actions.

EASA reminds that implementation of those corrective actions is a maintenance action, which must be accomplished in accordance with approved maintenance data and applicable regulations.

EASA recommends flight crews of aircraft equipped with any transponder listed in the Applicability of this SIB to monitor transponder functionality:

- Flight crews should monitor the reply indicator on the human-machine-interface (where available) is intermittently or continuously active, to confirm that the transponder replies to interrogations.
- Whenever the transponder is operated in an area of radar coverage and the flight crew suspects non-compliantly absent replies, flight crew should contact the competent Air Traffic Control unit using radio communications and request the status of radar contact.

This is information only. Recommendations are not mandatory.



Contact(s):

For further information contact the EASA Safety Information Section, Certification Directorate.

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APPENDIX 1

Procedure for identifying the installed FPGA microcode version

The following procedures apply to commonly found installation pairings of human-machine interfaces and affected transponders:

- 1) VT-01 transponder (central unit) connected to VT-01 steering unit:
Power up the transponder. Set it to mode ON or mode ALT. Read the “Central Unit FPGA v.” number from the steering unit’s “Info” menu. Detailed guidance is provided in Chapter 5 of the VT-01 Transponder User manual (doc. no. 01.0200.10E, rev. 1.4).
- 2) VT-02 transponder (system unit) with VT-02 human-machine interface:
Power up the transponder. Set it to mode ON or mode ALT. Read the “Central Unit FPGA v.” number from the steering unit’s “Info” menu. See Chapter 5 of the VT-02 Transponder User manual (doc. no. 02.0200.10E, rev. 1.0 or 1.1) for a description of this analogous procedure.
- 3) VT-02 transponder (system unit) with VT-2000 human-machine interface:
Power up the transponder. Set it to mode ON or mode ALT. Read the “FPGA: v” number from the human-machine-interface’s “Info” screen in the “Settings” menu. Detailed guidance is provided in Section 9.2.1.2 of the VT-02 Transponder Installation Manual - English - (doc. no. 02.0200.11E, rev. 1.3).
- 4) VT-01 transponder (central unit) connected to ACD-57 AIR Control Display 57:
Power up the transponder. Set it to mode ON or mode ALT. Read the “FPGA VERSION” number from the AIR Control Display’s configuration menu; “XPDR SYSTEM” sub-menu -> “INFO” page. Detailed guidance is provided in Appendix A of the AIR Control Display 57 Pilot’s Manual (doc. no. MAN0010A0001, rev. 3.0).

More detailed instructions are available in the respective manuals referenced above, which were shipped with all affected units, and which are available for download at <https://www.air-avionics.com> -> “Support”.

This is information only. Recommendations are not mandatory.

