

REFERENCE: J15/9/GEN

ENQ: SENIOR MANAGER AIRWORTHINESS

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SOUTH AFRICAN CIVIL AVIATION AUTHORITY

AIRWORTHINESS DIVISION

MAINTENANCE ADVISORY NOTICE

SACAA ADOPTION OF ICAO STATE LETTER SP 44/1-09/88

APPLICABLE TO:

Aircraft operators and Aircraft maintenance organizations, operating and maintaining aircraft with Secondary surveillance radar transponder.

PURPOSE OF THIS MAINTENANCE ADVISORY NOTICE:

Advice to aircraft operators and maintenance organizations on the special precautions and appropriate procedures to be made during transponder testing and maintenance to avoid the generation of ACAS TAs potential adverse effects on ACAS of aircraft in flight. TAs/RAs due to transponder testing on the ground are disruptive and potentially hazardous and must be prevented. To avoid these TAs/RAs special caution and appropriate procedures are required during transponder testing and maintenance.

BACKGROUND:

This maintenance advisory notice is adopting the transponder ground testing guidance material developed by the Aeronautical Surveillance Panel and accepted by the Air Navigation Commission, at the fifth meeting of its 181st Session held on 9 June 2009 as referenced on the ICAO state letter REF: SP 44/1-09/88 dated 2 December 2009,

SAFETY WARNING :

- TCAS II interrogates, within its range, all Mode S and Mode A/C SSR transponders squawking altitude. That includes ground-based transponders operated for testing or maintenance.
- If these transponders respond with an altitude report close to that of aircraft flying in the vicinity, their TCAS II Traffic Display will show a 'ghost' target and, more seriously, could generate TAs/RAs against such targets.
- Internationally, events have been reported in which RAs were generated by transponders that were being tested on the ground.

- These unnecessary RAs are disruptive to the flight crew and air traffic control.

GUIDANCE ON TRANSPONDER GROUND TESTING

To avoid the generation of airborne collision avoidance system (ACAS) traffic advisories (TAs) and resolution advisories (RAs), special precautions and appropriate procedures described below are required during transponder testing and maintenance:

- a) When not required, ensure that all transponders are set to "OFF" or "Standby";
- b) Before starting any test, contact the local air traffic control (ATC) unit or the nearest centre that is using surveillance for ATM i.e SSR, and advise them of your intention to conduct transponder testing and indicate the planned start time and test duration. Also inform them of your intended Mode A code (see subparagraph c) below) and your intended aircraft identification (Flight ID, see subparagraph d) below);
- c) Prior to "switch-on" or with the transponder in "standby" mode, set the Mode A code to a value that is regionally agreed to be used for transponder testing;

Note. — *Mode A code 7 776 is assigned as a reserved code in Europe, specifically for the testing of transponders. Australia requires the use of Mode A code 2 100 for transponder testing.*

- d) For a Mode S transponder, set the aircraft identification (Flight ID) to the first eight characters of the name of the company that is conducting the tests (or something to that effect);
- 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 parameter of a Mode A/C or Mode S transponder, radiate directly into the ramp test set via the prescribed attenuator;
- i) Manually set the altitude to an unrealistically high value (i.e. over 60 000 feet);
- j) In between testing, i.e. to transition from one altitude to another, or changing the Mode A code, set the transponder to "Standby" mode before changing the altitude input;

- k) When testing is complete, immediately set the transponder(s) to "OFF" or "Standby"; C-2
- l) Simulation of ACAS operation must not be carried out by radiating from an antenna located on, or remotely based, from a workshop; and
- m) Finally, it should be noted that the current practices of testing transponders with different altitudes using Gilham encoders may no longer be required for aircraft using altitude encoders with serial output.

CONCLUSION:

The use of this material by aircraft Operators and aircraft maintenance organization in the planning and implementation activities will ensure long-term sustainability and correct operation of surveillance and collision avoidance systems.


Obert Chakarisa
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South African Civil Aviation Authority

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COMMISSIONER FOR CIVIL AVIATION

DATE