

Standard Change CS-SC002bc

INSTALLATION OF MODE S ELEMENTARY SURVEILLANCE EQUIPMENT

1. Purpose

This SC is for the installation ~~or exchange~~ of a Mode S transponder, including, optionally, an altitude encoder ~~exchange~~. The individual installation of an altitude encoder is covered by this SC. This SC does not include the installation of antennas (see CS-SC004, which may be applied concurrently).

Commented [JM1]: Why removed?

Note: This SC does not qualify the TABS equipment installation to meet the transponder or ADS-B requirements defined in Commission Implementing Regulations (EU) Nos 1206/2011¹³ and 1207/2011¹⁴. Therefore, this TABS installation is not sufficient to permit the pilot to fly the aircraft into transponder mandatory zones (TMZs).

Commented [JM2]: This note must be incorrectly placed? It seems to belong to SC058.
-Suggest to delete

2. Applicability/Eligibility

This SC is applicable to Aeroplanes that are not being complex motor-powered aircraft, and which have with a maximum cruising speed in ISA conditions below 250 kts, to rotorcraft that are not being complex motor-powered aircraft, and to any ELA2 aircraft.

3. Acceptable methods, techniques, and practices

The following standards contain acceptable data:

- FAA Advisory Circular AC 43-13-2B, Chapter 2., and
- FAA Advisory Circular AC 43.13-1B, Chapter 11.

Additionally, the following conditions applies:

- The transponder equipment and its installation ~~are in compliance with~~ meets paragraph point CS ACNS.D.ELS.010 of CS-ACNS, and the altitude encoder meets ETSO-C88Aa, or later amendments, or its equivalent.
- The elementary surveillance system provides data according to CS ACNS.D.ELS.015.
- If automatic determination of the on-the-ground status is not available, the on-the-ground status is set to 'airborne'.
- The reported pressure altitude is obtained from an approved source that is connected to the static pressure system that provides pressure to the instrument used to control the aircraft.
- Any antenna connected to the transponder has a resulting pattern which is vertically polarised, omnidirectional in the horizontal plane and has sufficient vertical beam width to ensure proper system operation during normal aircraft manoeuvres.
- The equipment is qualified for the environmental conditions to be expected during normal operation.
- The instructions from the equipment manufacturer have to be followed.
- A system ground test that verifies all the transmitted data according to ACNS.D.ELS.015 has to be performed.

4. Limitations

Any limitations defined by the equipment manufacturer apply.

In the case of rotorcraft aircraft approved for night-vision imaging systems (NVIS)/night-vision goggles (NVGs), if cockpit panels are to be inserted, the change cannot be considered to be an SC.

¹³ Commission Implementing Regulation (EU) No 1206/2011 of 22 November 2011 laying down requirements on aircraft identification for surveillance for the single European sky (OJ L 305, 23.11.2011, p. 23) (<https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:305:0023:0034:EN:PDF>).

¹⁴ Commission Implementing Regulation (EU) No 1207/2011 of 22 November 2011 laying down requirements for the performance and the interoperability of surveillance for the single European sky (OJ L 305, 23.11.2011, p. 35) (<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011R1207&from=EN>).



3. Proposed amendments and rationale in detail

An installation according to this SC cannot be claimed to be compliant to with ~~does not satisfy requirements set by CS-ACNS Subpart D Section 4 1090 MHz Extended Squitter (ES) ADS-B Out installations compliant to Section 4 of CS-ACNS or nor to with~~ AMC 20-24.

Note: SC-CS006 refers to the installation of ADS-B OUT equipment that is compliant with AMC 20-24.

However, the voluntary transmission of additional ADS-B data (e.g. GPS position and velocity) can be accepted when the position and velocity quality indicators report the lowest quality, the equipment manufacturer has stated compatibility with the directly connected GNSS source, and the transponder is not authorised in accordance with ETSO-C166b or equivalent.

The voluntary transmission of additional ADS-B data (e.g. GPS position and velocity) is also permitted when the position and velocity quality indicators report the quality provided by a Class B TABS certified in accordance with ETSO-C199() or equivalent, or by a GPS source that was certified in accordance with ETSO-C196a, C145c, C145e, C146c, or C146e.

If a Class A TABS equipment, is already installed in the aircraft, the Mode S Transponder system cannot be installed using CS-STAN.

Note: An ETSO-C199 Class A TABS device is not certified in accordance with ETSO-C166() and ETSO-C112().

5. Manuals

Amend the AFM with AFMS that containing or referencing the equipment instructions for operation, as required.

Amend the Instructions for Continued Airworthiness (ICAs) to establish maintenance actions/inspections and intervals, as required. In particular, include in the ICAs a check every ~~two~~ 2 years in accordance with the latest version of EASA SIB No. 2011-15.

The ground test shall also include voluntarily transmitted ADS-B data (if any).

6. Release to service

This SC is not suitable for the release to service of the aircraft by the Pilot-owner.

Commented [JM3]: Delete as part of the Merge and update of SC005 and SC006

Commented [JM4]: Are provisions for zero QI system still needed? It is recommended that EASA reconsiders this text in the light of the final version of the SCs (005, 058).

If EASA wants to keep the option then is suggested to add a RECOMMENDATION for full ADS-B installations: ADS-B installations are recommended to be made according to SC005 or SC058.

And update the zero QI text as follows:

Proposed new text: The voluntary transmission of additional ADS-B data (e.g. GPS position and velocity) is accepted for systems

1. with a GNSS source that is not certified in accordance with an ETSO and
2. when the equipment manufacturer has stated compatibility with the directly connected GNSS source and
3. the transponder is configured to report SIL=0 and SDA=0 (and NACp=0).

Commented [JM5]: Suggest to delete this from this SC. It is better addressed under SC058 TABS (since it is a TABS equipment).

Commented [JM6]: Proposed wording: In case an ETSO-C199 Class A TABS device,...

Deleted: which is not certified in accordance with ETSO-C166() or ETSO-C112(), or equivalent,

Commented [JM7]: TBD if needed.



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