1 Purpose and Scope

2 Functional and Operational Requirements

3 ADS-B and Airborne System Definition and Performance Requirements

3.1 System Scope and Definition of Terms

3.2 System Descriptions

3.3 System Application Requirements

3.3.1 Latency

In general, latency is synonymous with data age. As used in this document it is the difference between the time attributed to source data and the time that data are presented at a particular interface. {This definition was adapted from DO-289 section 2.4.5.3.3.4} Some data latency can be compensated with extrapolation techniques; however, there will always be a small amount of latency compensation error that needs to be minimized. This section includes the requirements for the end-to-end latency, referred to as total latency, for ADS-B, ADS-R and TIS-B; the latency allocations to some key subsystems; and the allowable compensation error for ADS-B.

3.3.1.1 Total Latency for ADS-B and ADS-R

The total latency for ADS-B and ADS-R is the time difference between the Time of Measurement (TOM) of the source data at the transmitting aircraft and the time that data are displayed to the user on the receiving aircraft. {Verify the correct referenced system or subsystem in these requirements.}

The total latency for source position and velocity data in ADS-B and ADS-R shall (Rx.xxx) be no greater than 5.5 seconds to support the applications included in section 2.1.x for ADS-B and 2.1.1 for ADS-R. {This requirement is consistent with the ASA MOPS draft version 4.10, 16 July 2011, but is less stringent than the FAA final Program Requirements (fPR) for SBS, version 3.0, 23 July 2010, which requires 5 seconds.}

The total latency for updated ID/Status information in ADS-B and ADS-R shall (Rx.xxx) be no greater than 30 seconds. {This requirement is consistent with the FAA final Program Requirements (fPR) for SBS, version 3.0, 23 July 2010} ➔ May need a Note here to explain. Check App-L from DO-242A. 🡸

3.3.1.2 Navigation Subsystem Latency Allocation

The latency allocation for the navigation subsystem that measures the source position and velocity for the ADS-B transmitting aircraft/vehicle shall (Rx.xxx) be no greater than 0.5 seconds. {This requirement is consistent with the ASA MOPS draft version 4.10, 16 July 2011}

Note: This subsystem latency allocation is included in the total latency.

3.3.1.3 TIS-B Subsystem Latency Allocation

The TIS-B subsystem latency is the difference between the TOM of the source position data and the time of transmission of the TIS-B Message by the ground radio station, interfaces A2 to D in Figure xxx.

The latency allocation for the TIS-B ground subsystem shall (Rx.xxx) be no greater than 3.25 seconds to support the applications included in section 2.1.2. {This requirement is consistent with DO-289 section 3.1.1.5, (no number assigned to the shall in this section), 286R2.5-01, and the FAA Essential Services

Specification for SBS, version 2.2, 29 November 2010} ➔In the future there may be a need for separate requirements for airborne and/or surface TIS-B 🡐

3.3.1.4 Latency Compensation Error

The latency compensation error is the residual after the TOM on the transmitting aircraft/vehicle or the Time of Applicability (TOA) of the position data on the receiving aircraft/vehicle has been estimated. The allowable errors in the following requirements are included in the total latency defined above. {The requirements in this section are expected to be consistent with version 4.10 of the ASA MOPS. The transmit-side latency compensation error is consistent with the FAA final Program Requirements (fPR) for SBS, version 3.0, 23 July 2010, however, the receive-side error is not accounted for in the fPR.}

The latency compensation error of measured geometric position and velocity data in the aircraft/vehicle transmitting ADS-B (interfaces A1 to D in figure 2.x) shall (Rx.xxx) be no greater than 0.6 seconds (at 95% probability).

The latency compensation error of retransmitted geometric position ~~and velocity data~~ by the ADS-R ground subsystem (interfaces B2 to D in figure 2.x) shall (Rx.xxx) be no greater than 0.1 seconds (at 95% probability).

The latency compensation error of source position data by the TIS-B ground subsystem (interfaces A2 to D in figure 2.x) shall (Rx.xxx) be no greater than 0.5 seconds (at 95% probability). {Reference 286R2.5-02}

The latency compensation error of measured geometric position data in the aircraft/vehicle receiving ADS-B, ADS-R or TIS-B (interfaces D to E in figure 2.x) shall (Rx.xxx) be no greater than 0.5 seconds (at 95% probability).

3.3.2 ADS-R/TIS-B Service Status Update Interval

The update interval is the time between successive updates of particular information at the receiving aircraft/vehicle.

The update interval of ADS-R or TIS-B Service Status information in the receiving aircraft shall (Rx.xxx) be less than 30 seconds. {This requirement is consistent with the FAA final Program Requirements (fPR) for SBS, version 3.0, 23 July 2010}