

ISSUE DOCUMENTATION – RTCA SC-186



Tracking Information (committee secretary only)	
Change Issue Number	13
Submission Date	13 February 2004
Status (open/closed/deferred)	Pending
Last Action Date	15 September 2004

Short Title for Change Issue:	TIS-B needs to perform ADS-B to SSR registration function
-------------------------------	---

Topic:	<input type="checkbox"/> ASA	<input checked="" type="checkbox"/> High-level	<input type="checkbox"/> ASAS	<input type="checkbox"/> STP	<input type="checkbox"/> ASSAP	<input type="checkbox"/> CDTI
Document Reference:			Originator Information:			
Entire document (y/n)		Name	Mike Castle (on behalf of WG4)			
Section number(s)		Phone	(443) 778-4319			
Paragraph number(s)		E-mail	Michael.castle@jhuapl.edu			
Table/Figure number(s)		Other				

Proposed Rationale for Consideration (originator should check all that apply):	
<input type="checkbox"/>	Item needed to coordinate with other documents
<input checked="" type="checkbox"/>	ASA MASPS
<input type="checkbox"/>	1090 MHz Link MOPS
<input type="checkbox"/>	UAT Link MOPS
<input checked="" type="checkbox"/>	TIS-B MASPS
<input type="checkbox"/>	Previously written CDTI MOPS
<input type="checkbox"/>	Other (include document title):
<input type="checkbox"/>	Item needed for harmonization with international requirements
<input type="checkbox"/>	Item identified during recent ADS-B development activities and operational evaluations
<input type="checkbox"/>	MOPS clarifications and correction item
<input type="checkbox"/>	Validation/modification of questioned MOPS requirement item
<input type="checkbox"/>	Military use provision item
<input type="checkbox"/>	New requirement item

Nature of Issue:	<input type="checkbox"/> Editorial	<input type="checkbox"/> Clarity	<input type="checkbox"/> Performance	<input type="checkbox"/> Functional
Issue Description:				
<p>ASAS will have limited access to data from ground sensors. Therefore WG4 expects that TIS-B will perform sensor registration between the ground sensors and ADS-B, and will send reports with acceptable registration differences to the airborne receivers.</p>				

Originator's proposed resolution:
<p>Confirm that the TIS-B MASPS will address requirements on this function.</p>

WG4 Deliberations:

Andy Zeitlin, Co-chair for WG2 provided the following TIS-B MASPS language which he believes closes this IP. (September 2004):

Quoting from the draft of Revision A of the TIS-B MASPS, the following sections address this function:

3.1.2.1 Sensor Adaptation

The Sensor Adaptation function shall (3.1-49) align the contributing sensors, with WGS-84 as a common reference, using measurements from a GNSS-equipped aircraft/surveyor.

Note: This may be accomplished either statically or dynamically. However, a static alignment process must be monitored to ensure alignment within a bias residual that will allow the tracking accuracy to meet the requirements of the proposed TIS-B application. The intent is to minimize bias with respect to the standard for high-quality GNSS navigation systems used in ADS-B.

The Sensor Adaptation function shall (3.1-50) apply alignment corrections to the Sensor Data to compensate for known, systematic errors.

Guidance: To assure that the implemented ASA applications are supported, the Controlling Authority may require both the initial calibration of sensors (e.g., range, bearing, range gain, and time of applicability bias) and ongoing estimates of performance. These may be based on data samples and sensor characteristics that can be used to derive a track accuracy and quality.

Note: Future applications may require sensor modifications or upgrades to meet the minimum performance requirements. Some existing sensors may be incapable of meeting the minimum application requirements. See Appendix B for background information on sensor performance.

The Sensor Adaptation function shall (3.1-51) output aligned Sensor Data to the Tracking function.

The Sensor Adaptation function shall (3.1-52) derive an estimate of the Time of Measurement of the input Sensor Data if it is not provided by the sensor.

Note: The Time of Measurement for Sensor Data is an estimate of the time the sensor measurement occurs. Time of Measurement is also used within this document to apply to a TIS-B Track Report.

The Sensor Adaptation function shall (3.1-53) monitor the status of each surveillance sensor supplying Sensor Data.

The Sensor Adaptation function shall (3.1-54) output Surveillance Status Reports for all sensors providing Sensor Data.

Note: A Surveillance Status Report announces abnormal conditions and changes in operating states associated with each surveillance sensor used to support a TIS-B Traffic Information Volume.