

Minutes of SC186 WG2
Trios Associates, Washington DC
17-18 February, 2004

Attendance:

Andy Zeitlin
Ken Staub
Ron Staab
Rob Strain
Gary Livack
Gene Wong
Roxaneh Chamlou
Bill Harman (phone)
Todd Kilbourne
Chris Moody

Status

Andy reviewed ASA MASPS status, RFG work for Package 1 and potential update to ASA MASPS, and recent WG1/4 mtg. beginning ASAS MOPS (STP, ASSAP, CDTI). Gene said their schedule expedites STP and two applications (one air-air) for one year, and others in 1.5 years. FAA AIR's Surveillance AC draft contains controversial issues (e.g., independence of nav/surveillance, addresses many unrelated systems) and WGs recommended delaying the rapid schedule for that document.

Gary asked about the U.S. East Coast deployment. Rob said it is consistent with TIS-B MASPS and new MOPS are not required. More functionality will be implemented in later phases.

Registration Issue

WG4 asked for TIS-B to require sensor registration. Rob asked what specific requirements are needed (e.g., how often to check, dependence on range, cost issues). The sensors will be aligned to "truth" using a "good" source such as differential GPS. We can't guarantee correspondence of TIS-B reports with respect to each aircraft's ADS-B – that's an aircraft accuracy/integrity issue. There is some lower bound on bias that makes sense – somewhat less than the announced accuracy (random component) should suffice.

We should elaborate our existing requirement (3.1-47) to align sensors to "a common reference". The intent is to minimize bias with respect to high-quality navigation systems used in ADS-B. A test procedure (too detailed to spell out in MASPS) would specify how many aircraft, what types of nav. source, etc. to use. How often to monitor/recalibrate/alert? APL has reported on bias variation over 9 months.

Scope of MASPS – Applications Supported

Andy suggested that the scope could differ for Rebroadcast Service – it need not be limited to Visual applications; the broadcast ADS-B from aircraft could be used for any purposes for which it qualifies.

To make best use of the broadcast data, the using aircraft should be able to differentiate the following 3 types of reports:

- a. direct ADS-B from an aircraft
- b. TIS-B derived from ground surveillance
- c. TIS-B Rebroadcast of ADS-B

The importance of distinguishing (c.) from (a) lies in the additional latency added by the rebroadcast. (This is probably of no significance for Visual applications, but could affect advanced applications.) There is a concern against using scarce bits for this purpose.

If we don't identify (c.), the rebroadcast could be sent as a TIS-B message. Some of the quality fields (e.g. TQL) would need to be modified to reflect the additional latency.

The WG4 discussions, including Tony Warren's and Jonathan Hammer's positions, were briefly summarized.

After discussion, the meeting concluded that the Rev A TIS-B MASPS will: (1) support the Visual Applications, and (2) rebroadcast TQL=2 ADS-B reports that could be used for other applications. (*But see the discussion of Report Time Error, below.*) The receiving aircraft can allow for the latency requirement for TIS-B with TQL=2 (i.e., 2.1 sec). Rebroadcast will be formatted as a TIS-B report. Any requirements needed for other advanced applications are deferred to later revisions. This includes the subject of latency compensation, which is being discussed in WG4.

However, Report Time Accuracy still can't be conveyed with the precision needed for high-quality surveillance applications (TQL>1) as stated in the ASA MASPS. (*However, that parameter is still under discussion in WG4.*) Extrapolation is not a solution to reducing report time error, since it trades report time error for estimated position error.

Service Status

Chris reported the progress with the Avionics Guidance Document. WG5 prefers to send a list of addresses of aircraft who should receive "heartbeat" updates. It need not be done that way in 1090ES (i.e., an addressed heartbeat could be used).

Rob observed that this service effectively accomplishes what we have termed the Validation Service. (A target is correlated with its track.)

MASPS Scope and Text

The group discussed the use of ASA MASPS surveillance requirements in TIS-B MASPS. It was felt that ASA requirements might evolve, and thus it is preferable to point to that document rather than levy the same specific requirements in this one. Lower level functional requirements are available for Enhanced Visual Acquisition, and those for Surface Situational Awareness (ASSA) will be considered. It is still to be determined how much work is required to complete the ASSA application.

Although the ASA MASPS assigns the FAROA application identical requirements to those for ASSA, we have not determined if there is more complexity involved in adding this application to our document.

It will be stated in the text that an individual TIS-B installation does not need to support all applications addressed in the document; that depends largely on the quality of surveillance information available.

We are dealing with an issue with WG4 regarding several elements of TQL. For TQL=1, most parameters can be met. However, TIS-B can't meet the Report Time Accuracy of 1 sec, since the update rate is lower and report time is not broadcast. Also, NAC_v is not required for Enh. Vis. Acq, but a requirement is levied for TQL=1 due to some other applications. While TIS-B is allowed to use TQL=0, that value could be used if *any* parameter(s) fail to meet TQL=1 levels. We will set our own minimum levels, and likely many parameters will be required to meet the TQL=1 levels.

Our document will give applicable ASA requirements for reference, and point to derived requirements in the appropriate TIS-B subsystem(s). A table format will allow additional columns to be added when additional applications are addressed.

For parameters like NAC, SIL and NIC, the requirement will be to calculate and report the values. We also will give desired levels (goals) that specification writers can convert to requirements. In the case of SIL, Enh. Vis. Acq. requires 10^{-2} per hr, but encoding of SIL does not support that value – it requires SIL_E, which we do not support. Chris also observed that at installations where Air Traffic or Airways Facilities monitors sensor performance, some level of integrity is assured by those functions external to TIS-B.

Roxaneh provided a list of new surveillance processing requirements. The group adapted the language to the MASPS.