Meeting Minutes

of

RTCA SC-186

Working Group 2 (TIS-B) Meeting

Held At: Trios Associates, Inc.

April 23, 2003

Submitted

May 2, 2003

DETAILED MINUTES – WG-2

Working Group 2 (WG-2) held a scheduled meeting on April 23 in Washington, D.C. to prepare for the SC-186 Plenary meeting. WG-2 is developing the Traffic Information Services - Broadcast (TIS-B) series of standards.

1. ATTENDEES:

Andy Zeitlin, Co-Chair	Ken Staub, Co-Chair
Rob Strain	Stan Jones
Jim Chen	Bob Magee, Mulkerin Associates, for NASA GRC
Ron Staab	Kathy Kearns
Gary Livack	Bob Manning
Jen Rezeppa	Bob Pomrink
Paul Lipski	Roxaneh Chamlou
Gerry Preziotti	

2. STATUS

Andy announced that the TIS-B MASPS received approval from the RTCA PMC for publication as DO-286. It was emphasized that continued coordination with Europe is important. Ken wished to formalize our intention to coordinate with EUROCONTROL and EUROCAE and, if possible, to make the next version of MASPS a joint document.

3. IMPLEMENTATION PROGRESS

3.1. TIS-B Specification

A TIS-B Specification is under development by the FAA's Broadcast Services Manager (BSM) effort. Charlie Sloane (AND-510) and John Loynes (AND-503) are working on this as well as on a broader Surveillance effort.

3.2. Southeast System Deployment

A Southeast system deployment from Maryland to Florida is proceeding in parallel with full system deployment. A "mini-spec" is being developed in synchronization with the full system specification (for 600 sites, both links). The Southeast deployment will only include airborne situational awareness & FIS-B, with the UAT link only.

3.3. Embry-Riddle Aeronautical University Plans

Embry-Riddle Aeronautical University plans to install TIS-B at both their Arizona and Florida campuses. The UAT link will be supported initially, then multi-link later, adding 1090 ES.

3.4. Capstone

Capstone is planning to implement TIS-B in Anchorage this year. The deployment will be a "Frederick (MD) – like system."

3.5. AVR Presentation

Gary Livack is developing a Flight Standards Advisory Circular for approval of ADS-B applications. (Andy said they are correctly called ASA applications.) Gary wants to harmonize the applications with EUROCONTROL's Package 1 and later packages. AVR provided new direction to produce a joint Certification & Flight Standards AC. They need to be told the defined applications and services.

Ken Staub emphasized our intention to be consistent with other SC-186 groups and to harmonize with Europe Package 1. Andy pointed out differences between ASA applications and TIS-B services. There is a need to agree to terminology for applications and services.

There was discussion of the issuance of an AC for more or less mature applications. It was suggested they might follow the WG-4 bundling of application levels. Paul explained the need for the AC to give manufacturers guidance for certification.

4. PLAN FOR WG2 WORK ON DO-286, REVISION A MASPS

The following people either have volunteered to participate or were suggested to be contacted. In some cases, we expect they will need to suggest an alternate. Additional participants are encouraged. We need consistent participation. Ken will send invitations to these organizations.

WG-2 Area of Interest	WG-2 Member
Airframe	Tony Warren
Avionics	Jim Maynard & Tom Foster
FAA Surveillance and INFOSEC	Jim Chen
FAA Flight Standards	Gary Livack
FAA Certification	Paul Lipski (Seattle)
FAATC	Mike McNeil
Simulation and UAT	Larry Bachman
1090 ES	Ron Staab
Data link and integrity	Stan Jones

Surveillance implementations	Jonathan Bernays & Rob Strain
FAA SF21	Bob Nichols
Surveillance Processing	Bob Pomrink
	(Lockheed Martin)
	(Trios)
DOD Requirements	Bob Manning
Testing	Bob Magee

5. WG-2 SCHEDULE (EXACT DAYS - TBD)

WG2 will plan to deliver a Revision A MASPS within 18 months after the ASA MASPS is complete. The following weeks are planned for meetings:

SC-186 Plenary/WG-2 Meetings	Location
June 25-26	Trios Associates
Aug. 5-6	TBD
August 7 - 8, 2003 - Plenary	RTCA
Sep/Oct 2003 – Joint Plenary w/ EuroCAE WG-51	TBD
Oct. 7-8	TBD
Dec. 8-11	TBD
Mar. 8-9, 2004	TBD
Jun. 7-8	TBD
Sep. 6-7	TBD
Nov. 1-2, final draft approval	in Washington

Locations are unassigned. Members are encouraged to volunteer to host. Each meeting can be shorter or longer according to available material.

Bob Magee agreed to serve as Secretary.

6. MULTILINK GATEWAY

We need to define functional requirements, independent of physical architecture. The basic requirement is to receive a target report on one link and rebroadcast it as a report on another link. It can utilize functions already specified as ADS-B receive and transmit.

Rob Strain offered the suggestion of producing a Change document sooner, that would only update the requirements for Visual Acquisition in our original MASPS and add a Multilink gateway. This could be useful for SF21 implementations.

Stan argued that the Gateway should only accept ADS-B input. It can also be implemented where there is no radar input. If radar and ADS-B are both available as input, the Gateway rebroadcast would be used for equipped targets, and TIS-B based on radar for the unequipped. A correlation would be performed to help TIS-B to remove the equipped aircraft from its target list.

Ken said that the simplest "bent pipe" rebroadcast would waste bandwidth by broadcasting targets that were already broadcasting ADS-B on both links. The ground would need to learn which targets are so equipped, and would check the ID of a received report against its list of equipage capability before re-broadcasting it.

Bob Magee asked about the potential to rebroadcast to increase the range between target and receiving user. Ken observed that ADS-B MASPS already specify air-air range requirements, while ground-air requirements are new and will be related to defined service volumes.

Stan and Gerry felt that there would seldom be any benefit from broadcasting fused ADS-B and ground surveillance data. A fusion tracker would tend to highly weight the ADS-B portion anyway. However, the surface domain might be an exception. Bob P. urged us to keep the door open for roles for fusion, suggesting a low integrity broadcast as an example.

Bob Pomrink suggested there still might be other roles for fusion processing. The group observed that the present design adapts to an aircraft's link failure by adding it to the broadcast list. The Validation role is to be treated as a separate function. TIS-B still can perform correlation and may treat a target as unequipped if its received broadcast doesn't match the surveillance report.

A rebroadcast would need to fill the NAC, NIC and SIL fields, and the time would need to be recoverable. It needs to be explored how these fields might need to be recalculated (degraded) and what coasting/extrapolation is needed or allowed.

Bob raised the potential need for a Distribution function to control the stream of reports to a transmit radio. The radio may be shared with the traditional TIS-B broadcasts. Ken proposed that the TIS-B Distribution handle this function, except where Gateway was stand-alone.

7. ADDITIONAL APPLICATIONS

TIS-B may be capable of supporting additional applications. We need to derive TIS-B requirements from the WG4 ASA requirements. Their analyses of some applications are producing surveillance values that so far are not harmonized between applications, nor have been thoroughly reviewed. It appears that some parameters, such as SIL and update rates, may be

quite feasible to meet with existing ground surveillance. Other requirements may be met, but might require particular configurations. Velocity may prove to be the limiting factor in many cases for TIS-B support. There is also a need to reconcile update rate with latency.

8. SURVEILLANCE AND INTEGRITY

Stan Jones presented an overview of his paper on Integrity and its use in determining requirements on accuracy and integrity, in relation to the required distances used for safe separation. Stan suggested that instead of our existing methods for determining integrity, it can be simpler to develop required integrity by adjusting TIS-B target positions according to the biases calculated by comparing a nearby target's ADS-B report to its radar report. If there are no position errors, then Close Approach Probability (CAP), the ICAO reference, was used to set the current 3 and 5 mile radar separation standards. He also urged better coordination with the GPS vendor community to understand the GPS outputs.

9. ADJOURN

SC-186/WG-2 adjourned at 4:15 PM.