

**Minutes of Meeting #19 of RTCA SC-186 Working Group 3
For Maintenance of the ADS-B 1090 MHz MOPS**
<http://adsb.tc.faa.gov/WG3.htm>

The meeting was called to order by new Co-Chair Thomas Pagano at 9:00am 7 December 2005, at the facilities of RTCA in Washington DC. Mr. Pagano welcomed all attendees and asked that each attendee introduce themselves and their organization. The attendees for all or part of the meeting included:

Woody Bode, Freestate Electronics	Carl Jezierski, FAA TC – ACB-120	Kurt Schueler, Garmin International
David Bowen, Eurocae Technical Secretary	Ron Jones, FAA ASD-140	Stuart Searight, FAA TC – ACB-120
Allen Branch, FAA, AIR	Al Marshall, Sensis Corp	Ronald Staab, SAIC
Ken Carpenter, QinetiQ, UK	James Maynard, Garmin AT	Dave Thomas, L-3/Titan, FAATC-ACB-130
Rob Duffer, FAA, AIR	Vince Orlando, MIT Lincoln Lab	John Van Dongen, FAA TC – ACB-130
Gary Furr, L-3/Titan, FAATC-ACB-130	Tom Pagano, FAA TC – ACB-130	Don Walker, Honeywell
Bill Harman, MIT Lincoln Lab	Masoud Paydar, Secretariat, ICAO	
Ron Harris, Freestate Electronics	Bob Saffell, Rockwell Collins	

1. Tom Pagano gave a special thanks to the out-going Co-Chair Dr. Vincent Orlando for all of his years of service to the 1090ES effort. Tom indicated that Vince is continuing to try to retire by cutting back on the committees on which he serves. All of WG-3 wished him well.
2. Tom asked Vince Orlando to start the meeting off with a review of Working Paper WP07 in which Vince discusses the status of the 1090ES SARPS activity at ICAO. Vince discussed the practice at ICAO for producing SARPs in the past and how this process is changing. He indicated that the Air Navigation Commission (ANC) had requested that the majority of the text that had been presented at SCRSP/1 in November 2004 be moved out of the SARPs document and into a separate Technical Manual. The current plans involve moving an Appendix from the currently published 1090ES SARPs out into section 1 of this new Technical Manual. The updates to the SARPS required by DO-260A and the changes that were previously published in the Appendix to TSO C166 will be moved to section 2 of the new Technical Manual. The SCRSP Technical Subgroup (TSG) will meet in February to review the final changes to this new Technical Manual.
3. Next, following the addition to Agenda Item #4 of a new Working Paper WP12, Martin Stevens of Raytheon Systems Limited in the UK was asked to present his summary of initial findings during the testing of the Raytheon Decoder Demonstrator. Martin gave an initial overview of the 1090ES Raytheon decoder. Then he gave extensive details on the trials and data gathering that has occurred, mostly in Europe, over the last year or more. There were a number of technical observations reviewed where further analysis should help to determine whether the problem is with the Raytheon decoder or the ADS-B installation on an aircraft. Martin concluded that in Europe, almost half of the commercial aircraft are transmitting valid ADS-B Messages. Some aircraft are transmitting ADS-B Messages but without valid position data. Very few aircraft are transmitting false information and reporting it as valid.
4. Tom Pagano then gave his review of Working Paper WP08, which is the summary of testing of the Raytheon Decoder units at the FAA WJH Technical Center. Tom reported on the extensive testing done at the Tech Center and showed charts comparing the Raytheon Decoder to the MOPS decoder with the same receiver characteristics. Tom concluded that (1) the Raytheon ADS-B Demonstrator System meets the MOPS performance requirements for detection in the presence of ATCRBS and Mode S Overlaps tested in accordance with the MOPS, and (2) the Raytheon ADS-B Demonstrator System performance in simulated high density interference environments is similar to the performance of a MOPS compliant decoder implementation.

5. The Working Group next heard from Stuart Searight with respect to the status of the Requirements Focus Group (RFG). Stuart indicated that the objectives of the RFG were to (1) harmonize operational concepts for near-term surveillance applications enabled by ADS-B, Package 1, (2) to develop Safety, Performance, and Interoperability requirements for Package 1 applications, and (3) to perform these functions within the boundary of requirements set out in DO-264/ED-78A. Stuart indicated that because of the need for more detailed review of documentation, the RFG would not be able to bring documents to SC-186/WG-51 for approval prior to June 2006.
6. The Working Group next heard from Bill Harman discussing Working Paper WP02 concerning a first overview of a set of new procedures that have been found to significantly increase the detection probability of ADS-B replies in an interference environment. Bill discussed techniques that were documented by Dr. Jeff Gertz of MIT Lincoln Labs. Performance comparisons were made to the DO-260A approach; approaches developed by the FAA Technical Center and industry have been found to provide comparable performance.
7. Gary Furr presented Working Paper WP09 which was a brief overview of the Broadcast Services Ground Station (BSGS). The Working Group was informed that the FAA Team that was creating the BSGS Specification was about to release version 2.0 for Industry Review and Information. Working Paper WP09 will not be posted on the WG-3 web site until such time as the FAA releases the BSGS Specification version 2.0 to the public via the Federal Register. Gary indicated that the BSGS Team intends to release version 3.0 of the Specification in May 2006 for formal Request for Comment from Industry, followed in September 2006 with a Request for Proposal for the unified Ground Station.
8. The Working Group then heard from Gary Furr on Working Paper WP04 concerning the fact that AirServices Australia has tracked an Airbus A380 in their airspace that is transmitting DO-260A Messages, but has a SIL set to ZERO. Don Walker from Honeywell indicated that this was a hardware problem with the Honeywell system not being connected properly by Airbus. Don indicated that problem reports had been filed to correct the problem.
9. Gary Furr then presented Working Paper WP03 which was a brief summary of the changes from DO-260 to DO-260A to TSO C166 and finally to the draft of TSO C166A. This was a brief introduction to the much more detailed working papers that followed which detailed the changes for the proposed Change 1 for each of the two MOPS documents. After a short discussion of these changes, Vince Orlando requested that Gary produce a short working paper for presentation at the February TSG meeting that specifies those changes that need to be made to the proposed new 1090ES Technical Manual.
10. Working Paper WP05 was then presented by Gary Furr as that set of changes necessary for any manufacturer to implement if they were going to build a 1090ES transmit-only system based only on DO-260 requirements. This basic set of changes appeared first in Section 1 of the Appendix of TSO C166. However, with the introduction of the draft of TSO C166A, all materials referencing DO-260 will be removed. Thus, in order not to lose this set of changes and for the benefit of the International community, WG-3 was proposed to approve Change 1 to DO-260 for posting on the RTCA web site for sell. The Working Group approved the draft of Change 1. Gary Furr agreed to write a brief Executive Summary for the Change document prior to posting as a Final Review and Comment (FRAC) document for RTCA SC-186 approval.
11. The Meeting next heard again from Gary Furr with the presentation of Working Papers WP06 and WP11. Working Paper WP11 is a textual summary of each of the changes that are proposed in WP06 as a formal change document to DO-260A. The basic set of changes that were proposed in WP06 were originally published in Section 2 of the Appendix of TSO C166. As the FAA developed the requirements for the Broadcast Services Ground Station (BSGS), several further items were found to require changing, such as the inclusion of the ICAO Mode A Flag (IMF) in ADS-B Messages that are

transmitted by a Ground Station having just been received from an aircraft via the UAT data link. This process is referred to as ADS-B Re-broadcast, or “ADS-R.” During the discussion of the changes associated with the Aircraft/Vehicle Length and Width Codes, Bob Saffell discussed an issue that has been under consideration by SC-186 WG-4B related to the navigational center of the aircraft. The problem relates to the difficulty of the calculating required to apply the “Position Offset Applied” (POA) to all position calculations. A work around would be to set the navigational center of the aircraft at the GPS antenna. If this approach is agreed to by the STP MOPS WG-4B, then the “POA” bit in the Operational Status Message could be set to “reserved.” We will hear more about this from WG-4B and if necessary, the set of changes will be amended for the changes proposed in WP06. There was also a brief discussion within the Working Group concerning whether or not to propose that the ADS-B 1090ES Version Number be bumped from ONE (1) to TWO (2) because of the set of changes in WP06. It was agreed by the Working Group that it was not appropriate to change the Version Number. Gary Furr also agreed to create an Executive Summary for the front of the proposed Change 1 document prior to the document being made available to SC-186 for the Final Review and Comment period. Don Walker indicated that he would ask his company, Honeywell, to write a letter to the FAA Administrator indicating that they object to the retransmission of ADS-B Messages on an alternate data link on the basis of safety.

12. John Van Dongen dialed into the meeting in order to present Working Paper WP10. This Working Paper details what John believes to be a problem with the test procedures of §2.4.4.4 for preamble testing. These test procedures were originally written by Stacey Rowlan of L-3/ACSSD. Unfortunately, John had not been able to contact Stacey prior to the WG-3 meeting to discuss this Working Paper. It was agreed by the Working Group that a smaller team would be tasked with the review and possible resolution of the problems identified in WP10. This team will include John Van Dongen, Ron Harris, Martin Stevens, Stacey Rowlan and Bob Saffell. This team should be prepared to propose a resolution to this problem prior to mid January 2006 in order to have the issue included into the set of changes proposed for Change 1 to DO-260A.
13. It was agreed that the Working Group members would make available a time starting at 11:00am EST on Monday, 13 February 2006 for a possible teleconference related to the finalization of the two Change 1 documents. The two Change 1 documents would be prepared for distribution to RTCA in early to mid-March for distribution to SC-186 members for review and approval at the next SC-186 Plenary, which was agreed to as 20 April 2006. Working Group 3 members agreed to plan for a Working Group meeting the day before the Plenary, on 19 April at RTCA for the purpose of discussing any comments from SC-186 members related to either Change 1 document. After approval of the two Change 1 documents at SC-186 Plenary, they would be forwarded to the RTCA PMC for approval and posting on the RTCA Online Store.
14. The **Working Papers** for all WG-3 Meetings, as well as the Meeting Agendas, Meeting Minutes, Meeting Schedules and proposed modifications to both DO-260 and DO-260A will be posted on the ADS-B 1090 MHz web site maintained at the FAA William J Hughes Technical Center, located at: <http://adsb.tc.faa.gov/WG3.htm>