

Working Group 6  
RTCA DO-242A ADS-B MASPS  
Minutes of 14th Meeting held in Arlington VA.  
May 7-8, 2002

The attendees included:

|                                |                               |  |
|--------------------------------|-------------------------------|--|
| Tom Foster, Rockwell Collins   | Richard Barhydt, NASA Langley | James Maynard, UPS AT                    |
| Stuart Searight, FAA / ACB-420 | Ron Jones, FAA / ASD-140      | Bill Thedford, Titan Systems Corp - USAF |
| Jerry Anderson, AIR-130        | Robert Manning, AF/XOR-GANS   |  |

## Tuesday, 7 May

### 1. Introductory Remarks

- Tom Foster convened the meeting by welcoming everyone to the Rockwell offices and thanking all for a job well done on completing the ADS-B MASPS for plenary. It was agreed that our primary goal for the week was a review of all changes made to the plenary draft of the MASPS. Assuming all of that is accomplished, a secondary goal was to cover the agenda items dealing with the future WG6 work plan and the possible scope of DO-242B.

### 2. Review Agenda

- It was agreed to defer agenda items 3 and 4 on Intent Changes and Tables 3-4(a) through 3-4(e) until Bill Harman and/or Bill Thedford arrived. This was done due to their involvement in these topics on the plenary draft. With that change agreed to, the agenda was approved without further comment.

### 3. Review and Approve Minutes of Last Meeting

- Stuart apologized for not yet producing minutes from the WG6 meetings held during the week of plenary in April. This was due to the amount of time spent working on the document since plenary and a week off for paternity leave. Stuart promised to compile a short set of minutes from the April meeting which will document the efforts of WG6 to categorize all comments, the attempts to resolve all comments with the comment authors prior to plenary, and the “debrief” and action items assigned after plenary.

### 4. ADS-B Position Reference Point [Comments WG-5 #1, and UPS-AT #38]

- The discussions on the ADS-B reference point were complicated because of the interrelationships between §2.1.2.4 “Position”, §2.1.2.5 “ADS-B Position Reference Point”, §2.1.2.13 “NAC<sub>P</sub>”, §2.1.2.4 & §3.4.4.6 “A/V Length and Width Codes”, and §3.4.4.9.7 “Reporting ADS-B Reference Position Flag”.
- While the group accepted most of the changes Jim had done in these sections to meet the plenary agreements, it was agreed that some more work was needed to make these requirements and definitions more precise and less ambiguous.
- WG6 approved the reworked A/V Length and Width Codes. This was done in response to comment #1 from Rick Cassell on the plenary draft and closed Action Item 13-1.

- Figure 2-1, which illustrates the ADS-B Position Reference Point, was updated by Jim Maynard in response to Action Item 13-2. After some minor edits, this figure was approved by WG6 and AI 13-2 was considered closed.
  - Jim took the action item to refine this material and have it ready for review the next morning.
5. Conditions for Transmitting ARV Report Elements (§3.4.6.1) [Comment Tony Warren #12]
    - The updated §3.4.6.1, which now states that DO-242A does not specify any conditions for which ARV reports are required, was accepted.
    - It was agreed that §3.4.6.2 “ARV Report Update Requirements” should be changed to state it is a reserved section that will specify update requirements when/if any conditions are specified in §3.4.6.1 that require support of ARV reports in future versions of the MASPS.
    - Richard Barhydt’s updates for Appendix Q were reviewed and accepted. This closed Action Item 13-6.
  6. Creation of equipage Class B0 [Comments J. Anderson # 13, UPS-AT #22, and WG-5 #6]
    - The group created a definition for B0 equipment in §3.2.3.2 based on the existing definition for B1 equipment.
    - The entire MASPS was searched for references to B1 equipment and B0 was added as appropriate.
  7. Status Change Report [Comments J. Anderson #30 & #35-39, R. Jones #28, and UPS-AT #34]
    - The deletion of the subsection for Status Change report and accompanying updates were reviewed and approved. The accompanying updates included changing all references to the TS report to reference messages conveying changed values of relevant MS or TC elements.
  8. Intent Changes [Comments WG-3 #1, J. Anderson #34, and R. Jones #9 & #30]
    - The caveats regarding long-term intent and TC reports agreed to in plenary for §1.1, §2.1.2.19.2, and §3.4.8 were reviewed and verified that they appear as agreed to in plenary.
    - The changes to the update requirements for TC+0 reports specified in the text of 3.3.3.1.4 and Table 3-4(e) were reviewed and approved.
    - Table 3-4(d) and the changes of “state change” update performance from requirements for TS reports to desired performance were reviewed and approved.
    - Miscellaneous changes needed in §3.4.8 to make the text consistent with the manner in which these proposed requirements are now handled in the MASPS were reviewed and approved.
    - Changes to Appendix N provided by Tony Warren were reviewed and approved. This closed Action Item 13-4.
  9. Tables 3-4(a), 3-4(b), and 3-4(c) [Numerous comments & plenary discussion]
    - Table 3-4(a) was split to separate the performance requirements of State Vector and Mode Status. Table 3-4(a) now contains only the accuracy, update interval, and acquisition range requirements for the SV reports. The newly created Table 3-4(b) contains the accuracy and acquisition range requirements for MS reports. This splitting of the table was reviewed and agreed to.
    - All changes made to notes for these tables were reviewed and approved.
    - Table 3-4(c) and the text for §3.3.3.1.3 were reviewed and approved.

10. Appendix R [Comment C. Varner #3]

- The new Appendix R on determination of NAC<sub>P</sub> produced by Jim Maynard and based on Appendix J of DO-260 was reviewed and approved. This new appendix closed Action Items 13-3 and 13-8.

11. The group finished the day by examining those agreed to comments from plenary for which resolutions were still needed.

- Stuart took an action item to define “support” and “perform” as they apply to Tables 3-3(a) and 3-3(b). [Comment UPS-AT #25]
- Tom took an action to author notes explaining why there are no vertical integrity/accuracy bound for lower levels of NIC and NAC<sub>P</sub> in §2.1.2.12 and §2.1.2.13, respectively. [Comments UPS-AT #13 & #15]
- Richard took an action to consider ways to clarify the phrase “without alerting” in §2.1.2.15. [Comment C. Haissig #2]
- Jerry promised clarity and enlightenment on how to handle the “don’t know” case for the “TCAS/ACAS resolution advisory active” OM code in §3.4.4.10.1. [Comment UPS-AT #41]

### Wednesday, 8 May

4. (continued) ADS-B Position Reference Point

- The meeting reconvened with a review of the updates Jim performed on the material for §2.1.2.4 “Position”, §2.1.2.5 “ADS-B Position Reference Point”, and §2.1.2.13 “NAC<sub>P</sub>”.
- It was agreed that the requirement specifically prohibiting NAC<sub>P</sub> values of 10 or 11 if the Reporting ADS-B Reference Position Flag CC code is set to ZERO was overly prohibitive. It was determined that requirement R2.32 was all that was needed for addressing the limitations on NAC<sub>P</sub> values if reported position is not corrected to the ADS-B Navigation Reference Point. (R2.32 reads as follows: “The NAC<sub>P</sub> value broadcast from an ADS-B participant **shall** (R2.32) include any inaccuracies in the reported position due to the transmitting participant’s not correcting the position from the navigation sensor to that of the ADS-B position reference point (see §2.1.2.5).”)
- After much discussion and care taken to assure that all of these interrelated subsections were consistent and unambiguous, this material was approved.

12. WG6 next went through the work done by those who took action items the previous day. (See item #11 above.)

- Stuart’s proposed definitions for “perform” and “support” for Tables 3-3(a) and 3-3(b) were reviewed and approved after minor edits.
- Tom’s notes explaining why there are no vertical integrity/accuracy bound for lower levels of NIC and NAC<sub>P</sub> in §2.1.2.12 and §2.1.2.13, respectively, were reviewed and approved after minor edits.
- After Richard reported on his thoughts for clarifying the definition for “without alerting”, it was agreed to change the phrase to “without detection” in the MASPS.

- After some discussion, it was agreed that the “don’t know” condition for the “TCAS/ACAS resolution advisory active” OM code will be to assume an RA is currently active. These requirements were updated to read similar to how the “TCAS/ACAS Installed and Operational” CC code is specified.

13. Appendix O was reviewed and accepted. This closed Action Item 13-7.

14. The group then performed a page-turn review of the final version of the MASPS.

- Stuart reported on the verification process he adhered to in order to check that all comments agreed to the week of plenary were incorporated into the document and that there were no revisions in the document which did not map to either a submitted comment or specific agreement reached at plenary.
- The group accepted this report and decided that a review of all revisions shown in the document would be sufficient.
- This review was performed and minor editorial changes were made. At the completion of this review, the document was proclaimed final!! The only edits to still be made would be by Stuart in Section 4 renumbering all requirements as necessary and verifying that the requirements matrix in section 4 was consistent with the requirements in sections 2 and 3.

15. New / Revised Issue Papers

- No one had any new Issue Papers for review.

16. WG6 Work Plan

- Tom and Stuart reported on the plans to outline the scope of the next revisions of the ASA and ADS-B MASPS at the joint SC-186 plenary/ WG-51 meeting scheduled for September in Brussels. Currently there is interest being expressed to have revision A of the ASA MASPS and revision B of the ADS-B MASPS be joint RTCA/Eurocae documents.
- Tom distributed copies of an email he sent to the SC-186 leadership, which outlined possible topics that might be addressed in a joint DO-242B.
- It was agreed that a telecon might be held prior to Brussels to finalize any briefing needed for that meeting on the scope of DO-242B.
- While a “getting to know you” meeting being held in conjunction with the September plenary is a possibility, it was agreed not to schedule any WG6 meetings until at least such time as the ASA MASPS is submitted for final review and comment.

17. Future Meetings

- No WG6 meetings currently scheduled.
- Scheduled plenary dates:
  - June 19-21, 2002: RTCA, Washington D.C.
  - September 23, 24, 2002: Eurocontrol HQ, Brussels BE.
  - January 29-30, 2003: RTCA, Washington D.C.

18. Action Items

- See Table on following pages.

| Action Number | Action Item Description   | Assigned to     | Status        |
|---------------|---|-----------------|---------------|
| 13-1          | Review the recommended changes to the size code table (Cassel#1)  | Ken Staub       | Closed        |
| 13-2          | Revise the position reference figure and associated text(UPS-AT #5)   | Jim Maynard     | Closed        |
| 13-3          | Provide Appendix on NAC <sub>v</sub> determination when NAC <sub>v</sub> is not available (Varner #3)   | Jim Maynard     | Closed        |
| 13-4          | Review Appendix N for edits needed to be consistent with Plenary decisions on TC Report   | Tony Warren     | Closed        |
| 13-5          | Consult with Jonathan Hammer regarding the traffic scenario basis in Appendix J (Jones #19)   | Rich Barhydt    | Closed        |
| 13-6          | Review Appendix Q for edits needed to be consistent with comment resolutions & Plenary decisions  | Rich Barhydt    | Closed        |
| 13-7          | Review Appendix O for edits needed to be consistent with comment resolutions & Plenary decisions  | Tony Warren     | Closed        |
| 13-8          | Review Appendix R for edits needed to be consistent with comment resolutions & Plenary decisions  | Jim Maynard     | Closed        |
| 13-9          | Review Issue Papers for updates need to be consistent with DO-242A and final resolutions  | et al           | Closed        |
| 11-4          | Review Appendix L and determine what changes are needed as a result of the new intent requirements.   | Stan Jones      | Closed<br>OBE |
| 9-8           | Write an Issue Paper regarding the analysis needed to address the accuracy and latency requirements for altitude rate in a future MASPS revision.         | Tom Foster      |               |
| 9-10          | Author an Issue Paper stating the need to have the ASA MASPS service levels carried into the ADS-B MASPS.   | Jonathan Hammer |               |
| 9-20          | Write up summarization of the discussion on coasting, and element validity being based message reception requirements.                                    | Tom Foster      |               |
| 7-17          | Reword Issue Paper 19 to reflect the broader context of runway incursion alerting this paper now represents.  | Gary Livack     |               |
| 5-1           | Write an Issue Paper documenting the issues and concerns related to passive ranging. This Issue Paper will <u>not</u> be addressed in Rev A.              | Jim Maynard     |               |
| 3-9           | Write comments to IP15 explaining rationale for rejecting   | Dan Castleberry |               |
| 2-16          | Write ad hoc group's response to issue #3 of IP7 that will put issue in broader context and serve as proposal to WG#4 for consideration in the ASA MASPS. | Dan Castleberry |               |