

**Summary of Meeting #20, of RTCA SC-186, Working Group 5  
[For the Development of a Revision of the UAT MOPS]**

<http://adsb.tc.faa.gov/WG5.htm>

Meeting #20 of Working Group 5 (WG-5) was held 9 – 11 February 2004, at the Hilton Oceanside in Indialantic near Melbourne Florida, hosted by Bob Saffell of Rockwell Collins, Melbourne. The meeting was called to order at 9:00am on 9 February 2004 by Co-Chairman George Ligler. George welcomed all attendees and asked that each one introduce themselves and their organization. The attendees during all or part of the meeting session included:

Larry Bachman – JHU – APL	Stan Jones – Mitre CAASD	Tom Pagano – FAA-TC (ACB-410)
Mike Castle – JHU – APL	George Ligler – PMEI	Bob Saffell – Rockwell Collins
Ken Delp – FAA (AAL-512)	Bob Manning – HQ USAF XOR-GANS	Tom Teetor – Defense Concept Assoc.
Gary Furr – Titan - FAATC - ACB-410	Chris Moody – Mitre CAASD	Bill Thedford – Advanced Aero Consulting
Carl Gleason – Advancia FAA/NISC	Tom Mosher – Garmin AT	Edward Valovage – Sensis Corp
Richard Jennings – FAA (AIR-130)	Mark Oluvic – Lorch Microwave	Warren Wilson – Mitre Corp

1. After introductory remarks and the introduction of attendees, the Meeting began with George Ligler commenting on several items. First, as an Action Item from Meeting #19, George reported that he has spoken to Hal Moses at RTCA and that it is the decision of RTCA that the revision to DO-282 should be referenced as DO-282A. George also reports that RTCA has decided to not publish any more hardcopy “green cover” documents, but to only post electronic documents on their web site for sale. He confirmed that the Final Review and Comment (FRAC) of DO-282A would be on the Agenda of the upcoming RTCA SC-186 Plenary, which is currently planned to start at 9:00am on Thursday 8 April 2004 and could potentially go through noon on Friday, 9 April 2004, if necessary to get through all Agenda items.

George also indicates that the SafeFlight 21 Program Office has established a Systems Engineering Council to address the Ground Broadcast Infrastructure for the ADS-B Implementation in the NAS. George and Dr Larry Bachman are the two co-chairs for this Council.

George reports that the ICAO ACP WG-C UAT Subgroup will be meeting in Montreal 1-4 March to discuss the status of the UAT SARPS, Technical Manual and Implementation Manual, as well as to further define the Validation process and testing that will occur over the remaining year, prior to presenting the Validation results to WG-C during their April 2005 meeting.

Rich Jennings reported that he will probably update TSO C154 for UAT subsystems as a result of the publishing of DO-282A. There was a brief discussion related to the possibility of establishing a class of equipment that was an airborne receive only.

2. George then addressed Agenda Item #2, dealing with the status of the Flight Plan ID issue. As reported in the Minutes of Meeting #19, George has held meetings with Keith Dutch and the Chief Engineers of the Automation Systems such as ERAM and STARS. The results of those meetings were to state that the Flight Plan ID, while a good work-around for Capstone, was not to be implemented in DO-282A as discussed in Working Paper UAT-WP-14-02.

George reported that there was a meeting the week of 2 February in Washington DC with Steve Cramer and representatives of the Alaska Air Traffic branch, but that there has been no report coming out of that meeting as to whether or not there is a change in the status of implementation of the Flight Plan ID. This issue was discussed at several points during the meeting and again near the end of this meeting with the final point being that the Air Traffic Organization could submit a comment during the FRAC process prior to the RTCA SC-186 Plenary on 8 April which requests WG-5 to implement the Flight Plan ID into DO-282A as described in UAT-WP-14-02. However, in the absence of such a comment, no further changes are to be made to DO-282A with respect to the Flight Plan ID.

3. Under Agenda Item #3, Tom Pagano began review of the status of the coordination of the Diplexer with SCRSPTS WG-B, Technical Subgroup (TSG). Tom reported that he had given a report to the meeting of the SCRSPTS TSG during the week of 2 February at their meeting in Fort Lauderdale Florida. The objective of the presentation was to obtain their approval of the use of the Diplexer and the sharing of antennas with the Transponder and a UAT system. After the presentation and TSG discussion, Tom reports that the TSG agreed that the passive Diplexer was “reasonable,” but they requested more information be presented to them at their April TSG and WG-B meetings in Montreal. Tom additionally reported that it is his intention that flight testing of the Diplexer be a part of the testing that will otherwise take place as part of the validation of the UAT SARPS and the testing of the Capstone GBT.
4. The Working Group then began review of Working Paper UAT-WP-20-02 presented by Mike Castle as an analysis of UAT providing TIS-B services. The results of his analysis indicate that ADS-B and TIS-B systems can interfere with each other and that there are TIS-B “hotspots” where ADS-B performance is decreased. TIS-B intervals are strongly dependent on the detection intervals. Mike agreed to take an **Action Item** to (1) run an analysis of TIS-B services in a low-density environment, (2) further analyze the degradation of UAT surface applications in the presence of a TIS-B uplink station, and (3) include TIS-B in the UAT/DME compatibility analysis to be performed for the UAT Subgroup of ICAO ACP.
5. The Working Group then began review of Working Paper UAT-WP-20-01A that was provided by Chris Moody at the beginning of the meeting as a higher level presentation than that given in the Working Paper UAT-WP-20-01 that was distributed prior to the meeting. In this Working Paper, Chris discusses the need to have some sort of indication to a pilot that he is, or is not, in a TIS-B Service Volume. After some Working Group discussion regarding the issue and possible solutions, the Working Group *agreed* to designate the digital encoding of the Ground Uplink Frame type of 15 as “Reserved for Developmental Use,” and to add a note under the Table indicating that “*Frame Type 15 is intended for developmental use, such as to support on-air flight testing of new Ground Uplink Frame Types, prior to their adoption in future MOPS versions.*” This Frame Type Table and Ground Uplink Frame information appears in a newly created section in DO-282A as specified in Working Paper UAT-WP-15-08, which was adopted by WG-5 during Meeting 16 on 9/17/03.
6. The Working Group then began review of Working Paper UAT-WP-20-03 as presented by Tom Mosher. Tom proposes to modify the content of §2.4.6.2.1, Table 2-97 whose content he describes as being incorrect in several respects as published in DO-282. Tom indicates that the reason why the data in Table 2-97 is wrong is that the requirement stated in §2.2.6.2.1 needs clarification. In the Working Paper, Tom proposes a change to §2.2.6.2.1,

as well as a corrected Table 2-97. After a brief discussion, the Working Group *agreed* with both of the changes proposed in the Working Paper and directed Gary Furr to implement the changes in the proposed DO-282A and to account for the proposed changes in the “DO-282A-Change-Matrix” as posted on the UAT web site.

7. The Working Group then began review of a document that was distributed by Tom Mosher just prior to the meeting and which was numbered Working Paper UAT-WP-20-05, and posted on the UAT web site. This Working Paper proposed clarifications and modifications to the receiver performance requirements in §2.2.8.2.2 and §2.2.8.2.3. After Working Group discussion, all of the proposed modifications noted in the Working Paper were **agreed** to by the Working Group. As discussion continued, an additional modification was **agreed** to in sections §2.2.8.2.1.1, §2.2.8.2.1.2 and §2.2.8.2.1.3. These agreements were captured in a revision to the Working Paper, which was numbered UAT-WP-20-05A, which will be posted on the UAT web site. All of the changes will be accounted for in the “DO-282A-Change-Matrix” and rolled into the draft of DO-282A.
8. The Working Group continued with a brief discussion of the changes to DO-282A with respect to the optional passive Diplexer. Some minor editorial changes were made to the new text in §2.2.14.3 to stress the fact that the Diplexer was “optional” and “passive.” Tom Pagano also **agreed** to an **Action Item** to make available in Appendix E the results of any new testing that resulted from the requests received from the ICAO SCRSPS TSG. It was agreed that these test results might have to be submitted as comments during the FRAC period, since some of the testing might not be completed in the near term prior to the document being prepared for FRAC.
9. Following a request from Tom Mosher, the Working Group then began a review of Working Paper UAT-WP-19-09 because Tom Mosher had concerns with changes that had been proposed in the Test Procedures of §2.4.8.3.3 where Tom Pagano had inserted two additional tests using Data Set 4 and Data Set 5. After Working Group discussion, it was **agreed** that the tests expressed in Data Set 4 were appropriate and should remain in the Test Procedure. Further discussions, which extended into the next day of the meeting, resulted in a new subparagraph “d” being added to the requirement of §2.2.8.3.3 as follows:
  - d. The decode process associated with a fourth ADS-B trigger event that occurs during the simultaneous decoding of the second and third ADS-B trigger **shall** also be completed, provided that the fourth trigger event begins not earlier than 28 bit periods after the completion of the reception of the message associated with the initial ADS-B trigger event.

With the insertion of the new subparagraph “d,” Data Set 5 of the proposed Test Procedure identified in UAT-WP-19-09 was agreed to be valid and the Working Group **agreed** to leave the Test Procedure as proposed by Tom Pagano in UAT-WP-19-09.

10. A number of minor issues were discussed by the Working Group in an effort to make sure that we had covered all issues that Tom Mosher wanted to discuss. Among those issues were included making several corrections to Table 2-64 and Table 2-98 with respect to Data Lifetime. A new row was added at the bottom for “Airspeed” because it is now a part of the determination of the Air/Ground Condition, with a data lifetime of 2 seconds and listings as “Optional” for all Class “A” equipment and for Class “B1.” In Table 2-98, it was pointed

out that the Test Procedure referenced for §2.4.4.5.2.5.1 does not have a specific step testing the data lifetime for Radio Height. Tom Pagano **agreed** to take an **Action Item** to ensure that there was a test for data lifetime for the Radio Height.

11. The Working Group then began a review of Working Paper UAT-WP-20-04 as presented by Gary Furr as a complete summary of all of the changes to the UAT MOPS leading to the draft of DO-282A. Only those changes that were previously identified as being un-reviewed, or that have further discussion required were covered. The Working Group **agreed** that the data lifetimes in Table 2-64 and 2-98 for the TCAS/ACAS Resolution Advisory Flag should be changed from 60 seconds to 18 seconds. The Working Group further **agreed** that the data lifetime for NIC<sub>BARO</sub> should be changed from 60 seconds to 2 seconds.
  
12. The Working Group was then ask if there were any other known open issues. There was an issue that was surfaced by Ei Mon Phyu of the FAA Tech Center regarding the requirement in §2.2.8.3.1.1, subparagraph “a” whereby the first 5 bits of the Payload were required to be non-zero in order to declare a successful message reception. After Working Group discussion, it was **agreed** that this requirement should be removed from subparagraph “a” and turned into an additional Note at the end of these requirements. Editing of the draft DO-282A was accomplished during the meeting and Gary Furr was directed to account for this change in the “DO-282A-Change-Matrix” and on the UAT web site.
  
13. Rich Jennings raised his concern about a manufacturer building an ADS-B subsystem and not supporting the Precision mode. Working Group discussion on this topic led to several proposed changes for DO-282A. First, in section §2.2.7.2.3, the requirement that states that no extrapolation shall be performed when in the non-UTC Coupled condition, should be deleted, along with the first sentence of the note below the requirements. Secondly, it was suggested that additional requirements be added to the NIC Field Encoding (§2.2.4.5.2.4) and the NAC<sub>P</sub> Field Encoding (§2.2.4.5.4.9) sections. Editing of the draft DO-282A was accomplished during the meeting and Gary Furr was directed to account for these changes in the “DO-282A-Change-Matrix” and on the UAT web site. Further, Tom Pagano accepted an **Action Item** to review the Test Procedures in the affected sections to ensure that the Test Procedures were correct.
  
14. The Working Group agreed to hold a one-day meeting on 7 April 2004 at the offices of RTCA in Washington DC for the purpose of reviewing any FRAC comments against the draft DO-282A document that will have been reviewed by RTCA SC-186 members prior to the Plenary, which is currently scheduled for 8-9 April 2004.

Dates/Time	Meeting Place
7 April 2004	RTCA in Washington DC to review any FRAC comments made against the proposed draft of DO-282A.
8-9 April 2004	RTCA SC-186 Plenary at RTCA in Washington DC

All Working Papers for all WG-5 Meetings, as well as the Meeting Agendas, Meeting Minutes and Meeting Schedules will continue to be posted on the ADS-B UAT WG-5 web site located at: <http://adsb.tc.faa.gov/WG5.htm>