**Summary of Meeting #32 of RTCA SC-186 Working Group 3**
**and Meeting #9 of EUROCAE Working Group 51, Subgroup 1**
**held as a Joint Teleconference and WebEx Session for the**
**Maintenance of the ADS-B 1090 MHz Extended Squitter (1090ES) MOPS**
**at 10:00am EDT on Tuesday, 17 May 2011**
**http://adsb.tc.faa.gov/WG3.htm**

The meeting was called to order by Working Group 3 Co-Chair Thomas Pagano of the FAA ATO-P organization at about 10:10am, 17 May 2011. Gary Furr read off the list of participants that had joined via Telephone and WebEx. The participants during part, or all, of the meeting included:

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|---|---|---|
| Doug Arbuckle, FAA SBS Program Office | Al Marshall, Sensis Corp | Kurt Schueler, Garmin |
| Dave Barnard, L-3 / ACSS | Johan Martensson, Eurocontrol | Jorg Steinleitner, Eurocontrol |
| Raymond Bayh, BAE Systems | Dean Miller, Boeing ATM | Don Walker, FAA, AIR-130 |
| Gary Furr, Engility Corp, FAA AJP-653 | Tom Pagano, FAA, AJP-653 | Kevin Wilson, Honeywell International |
| Martin Gray, Trig Avionics | Alex Rodriguez, Rockwell Collins | |
| Greg Kuehl, UPS | Robert "Bob" Saffell, Rockwell Collins | |

Gary indicated that he had received regrets from Eric Potier and Larry Kenney because of their inability to join the teleconference.

1. Tom Pagano began the meeting with **Agenda Item #1** by welcoming all participants to the Teleconference. Tom indicated that we would review and discuss the list of errata that had been distributed as Working Paper 1090-WP32-02 by Gary with the invitation to this Teleconference back on 7 April 2011. This list of errata has been complied as a result of various comments and questions having come from the experiences of manufacturers as they begin implementing the requirements of DO-260B and ED-102A. Jorg Steinleitner agreed that this should only be a discussion on errata and not extend to the area of potential "changes" in requirements.

2. After Tom and Jorg concluded their initial remarks, the attention of the participants was drawn to **Agenda Item #2** to review the proposed Agenda. Gary Furr pointed out that a Working Paper had just been submitted by Martin Gray and it was tagged as WP32-06 and that this new Working Paper would be posted to the web page as soon as the teleconference was completed. Further, Gary noted that all revisions of Working Papers would be posted to that web page as soon as possible after their revision or after the end of the meeting. This includes a new draft version 2.0 of the Draft of Corrigendum to DO-260B/ED-102A, which would additionally be updated as a result of discussions during this Teleconference, and posted for the review during the next Teleconference.

3. Next, under **Agenda Item #3**, the Teleconference focused on Working Paper 1090-WP32-02 as presented by Gary Furr as the Summary of proposed errata to be applied to DO-260B/ED-102A. This draft document was distributed on 7 April 2011 as a draft copy for review and since that time has had several items added to it, and will have additional items added to it as a result of the discussions during this Teleconference.

4. Under **Agenda Item #4**, Gary Furr indicated that unless there was specific comments on the draft of Working Paper 1090-WP32-02, that he would proceed directly to the additional proposed errata presented in the Working Papers in Agenda Item #4. Bob Saffell indicated that he wanted to ensure that an item in 1090-WP32-02 was correct. Regarding item (1.14) Bob was concerned that the value -24 dBm appeared to have been struck through and replaced by positive 32 dBm. Gary clarified that the strikethrough only applied to the digits "24", but edited the test to make it clear that the replaced value was -32 dBm.

   4.1 The first Working Paper to be reviewed was 1090-WP32-03 as a set of potential errata submitted by Kevin Wilson of Honeywell. As each item was discussed, all items were agreed to as being applicable to the Corrigendum to DO-260B/ED-102A. The proposed resolution in §2.4.3.2.4.2, Step 4 was agreed by the Teleconference participants to additionally require a Note explaining the change to "36" seconds. Gary agreed to make a change in this resolution when it is implemented into draft version 2.0 of the Corriegndum.

   4.2 The next Working Paper to be reviewed was 1090-WP32-04 as a set of errata submitted by Raymond Bay of BAE Systems. In Bullet #1, the Teleconference participants remarked that if read carefully, these requirements were already well stated elsewhere. However, Tom Pagano and Gary Furr accepted ***Action Item 32-01*** to review the intent of this proposed clarification and to propose the text of a *Note* and a proposed location to place the *Note* in order to maximize understanding of the intent of the requirement.

   After discussion, it was agreed that the proposed clarifications presented in Bullet #2 of 1090-WP32-04 would be withdrawn from consideration. Additionally, the proposed clarification presented in Bullet #3 was also withdrawn, but there was Teleconference agreement that the proposed clarification would be preserved in an Issue Paper for further discussion if, or when, there is more discussion on development of DO-260C.

   1090-WP32-04 Bullets #4 and #5 deal with basically the same types of clarifications for the timeout and termination of the Target State and Status, and the Aircraft Operational Status Messages. During extensive discussion, there was review of both the requirements and test procedures sections of DO-260B/ED-102A that are associated with the proposal of these clarifications. Toward the end, the discussions were moving in the direction of making requirements changes and significant test procedure changes, when it was finally agreed that Tom Pagano and Gary Furr would accept ***Action Item 32-02*** to review the intent of these clarifications and propose *Notes*, and their locations for the purpose of ensuring understanding of the intent of these requirements and test procedures.

   1090-WP32-04 Bullet #6 was discussed briefly and it was determined that the TEST Message (Type Code=23) was a valid ADS-B Message Type that was for the continuing usage of manufacturers in a bench test environment, even though with the publication of DO-260A, it was used for the purpose of broadcasting the Mode A Code. It was agreed that no further action would be necessary with Bullet #6 and the suggested clarification was withdrawn.

4.3 The next Working Paper to be reviewed was 1090-WP32-05 as a set of errata submitted by Dean Miller and several of his colleagues from Boeing ATM. Bullet #1 dealt with a proposed clarification for the Geometric Vertical Accuracy (GVA) parameter and requested a clarification with its usage to apply to the Baro-Geometric Difference data field in the ADS-B Airborne Velocity Messages. After some discussion, it was agreed that Tom Pagano and Don Walker would accept ***Action Item 32-03*** to discuss this issue further and make a proposal on the need to add any *Notes* for clarification to the Corrigendum.

1090-WP32-05 Bullet #2 dealt with a need for clarification of the usage of the Horizontal Reference Direction (HRD) flag broadcast in both the airborne and surface formats of the Aircraft Operational Status Message. Dean suggests that there is a need to clarify the usage of the HRD to state that it only refers to the Heading / Ground Track field in the Surface Position Message (BDS Register $06_{16}$) or the Heading field in the Airborne Velocity Message (BDS Register $09_{16}$ Subtypes 3& 4) and not to the Selected Heading parameter in the Target State & Status Message. Since the Target State and Status Message was specifically revised in DO-260B/ED-102A at the request of UK NATS and Air Services Australia, there was discussion on the responses from those participants on this issue. Dean indicated that he has previously inquired, but as of the time of the discussion, was not in possession of their responses. Dean agreed to accept ***Action Item 32-04*** to research the responses on this issue from UK NATS and Australia and to supply those responses during the next Joint Teleconference.

1090-WP32-05 Bullet #3 identified that there was an incorrect reference in §2.2.5.1.22 which should be pointing to the paragraph for UAT IN. Gary Furr responded that this was already a recognized correction in the draft of the Corrigendum and was accounted for in 1090-WP32-02 under errata item "(1.9)."

4.4 The next Working Paper to be reviewed was 1090-WP32-06 as a set of errata submitted by Martin Gray of Trig Avionics. In Bullet #1, Martin indicates that he feels that a clarification is needed in the test procedure of §2.4.3.3.1.4.3.1, Step 4 to specify a time period which will ensure that the test is not terminated at the same 24 ±1 second period as is stated in several other test steps in this overall test procedure. After discussion, it was agreed that this clarification should be implemented into the draft of the Corrigendum. It was further agreed that the same correction should be applied to Step 2 of this same procedure. Gary Furr will implement the corrections into the draft version 2.0 of the Corrigendum to be posted for the next Teleconference.

1090-WP32-06 Bullets #2 and #4 were identified as clarifications that have already been discussed and agreed upon in Working Paper 1090-WP32-03 from Kevin Wilson. Gary Furr will implement these corrections into the draft version 2.0 of the Corrigendum to be posted for the next Teleconference.

1090-WP32-06 Bullet #3 was reviewed and agreed as a typographical error that should be corrected. Gary Furr will implement the correction into the draft version 2.0 of the Corrigendum to be posted for the next Teleconference.

1090-WP32-06 Bullet #5 identifies an issue that has existed since the publication of DO-260 in the test procedure for barometric altitude and GNSS Height Above Ellipsoid in the Airborne Position Message in §2.4.3.2.4.1 and §2.4.3.2.4.2 and specifically for the "Case #3" entries in both of Tables 2-137 and 2-138. The entries for 12.5 feet in these Cases is testing for the rounding of the ½ LSB. However, this is not generally testable with standard altitude inputs which normally have 1 foot resolution. It was therefore agreed that the values in both Tables 2-137 and 2-138 for Cases #3 would be changed to be "13 feet." Gary Furr will implement the corrections into the draft version 2.0 of the Corrigendum to be posted for the next Teleconference.

5. Under **Agenda Item #6**, the Meeting discussed the dates and times of the future meetings of the joint sessions of RTCA SC-186 WG-3 and EUROCAE WG-51, SG-1. The Meeting agreed that the currently planned future meetings in order to meet our schedule would be the following:

| Meeting # | Dates/Time | Meeting Location |
|---|---|---|
| | | |
| #33 | 7 June 2011 / 10:00am EDT | Teleconference and WebEx Session |
| #34 | TBD,<br>Probably some time in August | Teleconference and WebEx Session |
| | Proposed distribution of FRAC copy NLT 16 Sept 2011 | |
| #35 | 27 October 2011 | RTCA, Washington DC, with SC-186 Plenary on Friday, 28 October 2011 |

6. The following is a summary of all of the Action Items accepted during Meeting #32.

| Action Number | Action Description | Assigned to | Status |
|---|---|---|---|
| 32-01 | Review the proposed clarification in Item #1 of 1090-WP32-04 and craft a Note and propose an appropriate location to address the issue of the TCAS RA and an Emergency Message being broadcast at the same time. | Tom Pagano<br>Gary Furr | |
| 32-02 | Review the proposed clarifications presented in Items #4 and #5 of 1090-WP32-04, and craft a Note and propose an appropriate location to address the issue of the timeout and termination of the Target State and Status, and the Aircraft Operational Status Messages. | Tom Pagano<br>Gary Furr | |
| 32-03 | Review the issue identified in Item #1 of 1090-WP32-05 and make any recommendations for needed clarification of the usage of the Geometric Vertical Accuracy metric with respect to the Baro-Geo Difference data field in the Airborne Velocity Message. | Tom Pagano<br>Don Walker | |
| 32-04 | As regards the issue related to the usage of the HDR flag applying to the Selected Heading parameter to the Selected Heading parameter in the Target State and Status Message, Dean will double check is email for responses from UK NATS and Air Services Australia for their responses to the need for this association and will report back during the Joint Teleconference on 7 June. | Dean Miller | |

7. The **Working Papers** for all WG-3 Meetings, as well as the Meeting Agendas, Meeting Minutes, and Meeting Schedules are 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**