

**RTCA Special Committee 209**

**ATCRBS / Mode S Transponder MOPS Maintenance**

**Meeting #7**

**In Joint Session with Eurocae WG-49**

**Eurocontrol Headquarters, Brussels  
20 – 24 August 2007**

**Identified Open Issues in RTCA / DO-181D**

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**SUMMARY**

This Working Paper presents a list of Issues that remain open as we finalize RTCA / DO-181D. Some items on this list may be addressed during Meeting #7 prior to the discussion of this Working Paper.

## **1.0 Introduction**

During the recent preparation process for Meeting #7, I have collected a set of Open Issues in the latest draft of RTCA / DO-181D which need the attention of the entire Working Group in order to chart a course forward. These Issues will also probably affect ED-73C equally since we are trying to harmonize both documents.

## **2.0 Section §2.2.23.2 → Event-Driven Extended Squitter**

At one of the previous meetings, it was agreed by SC-209 that a place holder would be put into the Extended Squitter section §2.2.23 for the details of the information on the TCAS RA Broadcast Message (1090ES Message TYPE Code=23, Subtype=2).

Does it continue to make sense to provide this information in the Transponder MOPS?

If yes, then what do we want in this section?

## **3.0 Issues Related to TCAS in DO-181D / ED-73C**

- 3.1 Reference DO-181D, §2.2.22.1.2.2.2 & §2.2.22.1.2.2.3 to update the revised TCAS Version number bits as proposed to AEEC.
- 3.2 Make a decision on what references to leave as DO-181A and TSO C119A, and which references to change to DO-185B.

## **4.0 Issues Related to all Figures in DO-181D / ED-73C**

- 4.1 In DO-181D there are numerous Figures without a Title. The matching Figures in ED-73C are entitled “Test Equipment Connection.” Can we provide more meaningful Titles for those that are missing?
- 4.2 In DO-181C numerous Figures that were added were placed at the end of the document instead of being located near their point of first reference. In DO-181D, all Figures have been moved to be nearest to their initial reference, which has caused a misalignment of Figure numbering from front to back of the document. Will the entire universe come unglued if we numerically re-order the Figures?
- 4.3 A number of Figures in the current draft of DO-181D were developed with “Notes” inside the actual Figure instead of being in the line of document text after the Figure, as is standard RTCA practice. For the next draft of DO-181D, all of these “Notes” will be removed from the actual Figure and placed as document text below the Figure.
- 4.4 Can we agree on a single set of Visio figures to go into both documents? See the following Table of comparisons of Figures in DO-181D and ED-73C.

**Table of Figures in DO-181D and ED-73C**

<b>DO-181D Figures</b>	<b>DO-181D Titles</b>	<b>ED-73C Figures</b>	<b>ED-73C Titles</b>	<b>Status</b>
Figure 2-01	General Pulse Pattern for PAM Interrogations	Figure 1-1	General Pulse Pattern for PAM Interrogations	Identical
Figure 2-02	General Pulse Patterns for DPSK Interrogations	Figure 1-2	DPSK Pulse Characteristics	Almost identical
		Figure 3-1	Spectrum Limits for Mode S Transponder Transmitter	
Figure 2-03	Mode S Reply Waveform	Figure 3-2	Mode S Reply Waveform	Identical
Figure 2-04	Overview of Mode S Interrogation (Uplink) Formats	Figure 3-3	Overview of Mode S Interrogation (Uplink) Formats	Almost identical
Figure 2-05	Overview of Mode S Reply (Downlink) Formats	Figure 3-4	Overview of Mode S Reply (Downlink) Formats	Almost identical
Figure 2-06	Field Index	Figure 3-5A	Field Index (Uplink)	ED-73 needs updating
		Figure 3-5B	Field Index (Downlink)	ED-73 needs updating
Figure 2-07	Level 1 Transponder Uplink Formats	Figure 3-6	Level 1 Transponder Uplink Formats	Same content, different format
Figure 2-08	Level 1 Transponder Downlink Formats	Figure 3-7	Level 1 Transponder Downlink Formats	Same content, different format
Figure 2-09	Functional Diagram of Uplink Coding	Figure 3-8	Functional Diagram of Uplink Coding	Identical
Figure 2-10	Functional Diagram of Downlink Coding	Figure 3-9	Functional Diagram of Downlink Coding	Identical
Figure 2-11	The Level 1 Transponder: Interrogation Acceptance	Figure 3-10	The Level 1 Transponder: Interrogation Acceptance	Differences
Figure 2-12	All Transponders: Lockout Initiation	Figure 3-11	All Transponders Lockout Initiation	Differences
Figure 2-13	All Transponders: FS and VS Protocol	Figure 3-12	Flight Status and Vertical Status Protocols	Almost identical
Figure 2-14	All Transponders: Reply Content	Figure 3-13	Reply Content	Differences
Figure 2-15	All Level 2 Transponders: Formats	Figure 3-14	Transponder Formats for Level 2 Transponder	Same content, different format
Figure 2-16	Data Link Transponders Interrogation Acceptance	Figure 3-15	Data Link Transponders Interrogation Acceptance	Major differences
Figure 2-17	All Level 2 Transponders Coordination	Figure 3-16	All Data Link Transponders: Coordination	Identical
Figure 2-18	All Level 2 Transponders UM Protocol	Figure 3-17	UM Protocol	One minor difference
Figure 2-19	All Data Link Transponders B Protocol	Figure 3-18	Data Link Transponders: B-Protocol	Differences
		Figure 3-18A	Enhanced Comm-B Protocol	
Figure 2-20	Comm-C Reservation and Closeout	Figure 3-19	Comm-C Reservation and Close Out	Identical
		Figure 3-19A	Enhanced Comm-C Reservation and Close Out	
Figure 2-21	Comm-C Message Handling	Figure 3-20	Comm-C Message Handling	Major differences
		Figure 3-20A	Enhanced Comm-C Message Handling	Still different from DO-181D
Figure 2-22	Comm-D Reservation and Closeout	Figure 3-21	Comm-D Reservation and Closeout	Identical
		Figure 3-21A	Enhanced Comm-D Reservation and Closeout	
Figure 2-23	Comm-D Message Handling	Figure 3-22	Comm-D Message Handling	Major difference (Yes / No)
		Figure 3-22A	Enhanced Comm-D Message Handling	
Figure 2-24		Figure 5-1	Test Equipment Connection	Fig 5-1 matches Fig 2-24
Figure 2-25		Figure 5-2	Test Equipment Connection	Fig 5-2 matches Fig 2-25
Figure 2-26		Figure 5-3	Test Equipment Connection	Fig 5-3 matches Fig 2-26

<b>DO-181D Figures</b>	<b>DO-181D Titles</b>	<b>ED-73C Figures</b>	<b>ED-73C Titles</b>	<b>Status</b>
Figure 2-27		Figure 5-5	Test Equipment Connection	Fig 5-5 matches Fig 2-27
Figure 2-28				
Figure 2-29		Figure 5-6	Test Equipment Connection	Fig 5-6 matches Fig 2-29
Figure 2-30		Figure 5-7	Test Equipment Connection	Fig 5-7 matches Fig 2-30
Figure 2-31		Figure 5-8	Test Equipment Connection	Fig 5-8 matches Fig 2-31
Figure 2-32		Figure 5-4	Test Equipment Connection	Fig 5-4 matches Fig 2-32