

1090-WP-2-11  
30 January 2001

**RTCA Special Committee 186, Working Group 3**

**ADS-B 1090 MOPS**

**Meeting #2**

**Comments on Appendix I**

**(Presented by John Van Dongen, FAA Technical Center, ACT-350)**

<b>SUMMARY</b>
<b>Comments with respect to the published Appendix I of RTCA/DO-260.</b>

**ADS-B 1090 MHz MOPS COMMENTS  
RTCA SC-186 WG-3/EUROCAE WG-51 SG-1**

**Comments From: John Van Dongen, FAA ACT-350**

**Doc. Date/Version: DO-260, Sept. 13, 2001**

**Comments On: Appendix I**

**Date of Comments: January 30, 2001**

<b>No.</b>	<b>Para. Ref.</b>	<b>Comment/Proposed Change</b> ( <i>one change per line No.</i> )	<b>Rationale</b>	<b>Disposition of Comment</b>
1	I.2	2 <sup>nd</sup> paragraph: Change “Of these three application” to “Of these three applications”	Minor – Editorial	To be implemented by Gary Fur
2	I.3	Change “subject this Appendix” to “subject of this Appendix”	Minor – Editorial	To be implemented by Gary Fur
3	Figure I-2 d.	Need to correct placement of dashed line indicating upper limit of +/- 3 dB window as in figure I-2 e.	Figure accuracy	MIT will produce a new picture file for Figure 1-2 and forward to Gary Furr to insert.
4	I.4.1.2	Add to the end of the last paragraph: “A sampling rate of 8 samples per microsecond is used in this description, which is a typical value, although not the only possible design.”	To clarify the meaning of “3 samples wide” stated in the previous sentence.	Agreed to and implemented
5	I.4.1.2.1	Remove the last sentence if change no. 4 (above) is accepted. (Note: if change 4 is not accepted, correct grammar in I.4.1.2.1)	Redundancy	Agreed to and implemented
6	I.4.1.2.2.1	2 <sup>nd</sup> paragraph: Comment: Define a lead edge in terms of rise time, either in addition to or instead of an amplitude change with respect to a specific number of samples. Perhaps use the note from section 2.2.4.3.4.7.1 “An actual leading edge is defined as an event for which: the signal rises at a rate exceeding 48 dB per microsecond to a level above the receiver threshold AND 0.121 microseconds later the rate of rise is less than 48 dB per microsecond.”	To remove ambiguity of a lead edge definition when a sample rate other than 8 MHz is implemented.	Agreed to and implemented. Additionally modified Section 2.2.4.3.4.7.1

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7	I.4.1.2.2.1	<p>2<sup>nd</sup> paragraph: Comment: The statement “A pulse consists of 3 or more successive samples above threshold” applies to the 8 MHz sample rate. There is no guidance for relating the number of samples for a minimum pulse when a sample rate other than 8 MHz is implemented.</p> <p>NOTE1: Section 2.2.4.3.4.2 Narrow Pulse Discrimination requires “The DMTL control shall not be responsive to pulses that have a width of less than 0.3 microseconds.” Is this the minimum pulse that applies here? If so, a solution may be to add a note that states: “If an implementation uses a sampling rate other than 8 MHz, a pulse should be determined by the number of samples above threshold that is best suited to detecting pulses that have a minimum width of 0.3 microseconds.”</p>	<p>Section I.4.1.2.2.1 should provide specific guidance for selecting the number of samples that determine a minimum pulse declaration that may apply to any sample rate.</p>	<p>Agreed to and implemented</p>
8	I.4.1.2.2.4	<p>2<sup>nd</sup> paragraph: Does the statement “leading edges declared in their reference position” mean that there is no + or – sample tolerance allowed? If this is so, it may be too restrictive. It may be beneficial to allow a 1 clock tolerance but only in one direction.</p> <p>A solution might be to include preamble pulses that have leading edges declared in their reference position and if there was a timing offset imposed during preamble detection, allow leading edges offset by one clock only in the direction of the original position.</p>	<p>Preamble pulse spacing tolerance is specified to be .05 microseconds. Depending on sampling rate and the alignment of the incoming signal it could be common for lead edge position declaration to jitter between a reference position and adjoining samples from one preamble pulse to another. This effect will increase as the sample rate increases.</p>	<p>Retracted by John Van Dongen</p>

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9	I.4.1.2.2.4	Add to the end of the 2 <sup>nd</sup> paragraph: “If a sampling rate higher than 8 MHz is used it may be required to use 2 samples later than those immediately following the leading edge of the pulse to insure sampling in the flat section of the pulse.”	If a sampling rate higher than 8 MHz is used, the sample immediately following a leading edge may not be at the peak amplitude of the pulse.	Agreed to and implemented
10	I.4.1.2.3	Comment: (2 <sup>nd</sup> paragraph) Should this section define how to determine the declared level of the existing signal? Should the reference level be used? Or the mean of the amplitude of the 5 data pulses? – Discuss	Clarification	Changed word to “declared”
11	I.4.2.2	Change “3 dB band” to “6 dB band”	The “band” is + or – 3 dB from the reference level, thus a 6 dB band centered at the preamble level.	Agreed to and implemented
12	Table I-1	With the RMF enhanced reception implementation, the message decoding improved when the odd and even output combining matrix (table I-1) was modified. With the RMF implementation, high confidence is assigned only when there is agreement in bit value from both the odd and even samples.	Decoder performance	Deferred for more data analysis