

RTCA Special Committee 186, Working Group 5

ADS-B UAT MOPS (DO-282), Revision A

Meeting #20

***Clarifications to the Requirements of §2.2.6.2.1
and Corrections to the Test Procedure of §2.4.6.2.1,
for Tx MSO Selection***

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SUMMARY

This working paper proposes to modify the content of §2.4.6.2.1 Table 2-97, whose content is nothing short of spectacularly wrong. In addition, clarification of the requirement text of §2.2.6.2.1 is suggested, the lack of which in the original text was partly responsible for the resulting test procedure troubles.

This document consists primarily of extracts from several email exchanges, so that the relevant facts at play are all collected in one reference. Material from different authors is interspersed to make a logical presentation, but the individual authors are not identified. It was a group effort.

The Problem

Table 2-97 of the MOPS. (Test Procedure 2.4.6.2.1) is completely wrong.

The numbers in Table 2-97 assume that $R(0) = 0$. That's not right. As it says in §2.2.6.2.1 $R(0) = N(0) = 2152$ (if I did the binary to decimal conversion right). Thus, the zeroth MSO is 2904 after adding 752 to it.

Another problem seems to be with how the initial conditions are stated in the requirement. There is some ambiguity over how one gets started in generating the Tx MSO numbers.

See §2.2.6.2.1

The way it's written, when $m = 0$, $R(m)$ is a function of $R(-1)$, which is undefined.

The requirement reads a lot cleaner if it reads as follows:

At startup , $m = 0$.

If $m = 0$, then $R(0) = N(0)$

If $m \geq 1$, then $R(m) = \{ \textit{the existing equation...} \}$

This makes it clear that the first frame after power-up, $R(0)$ is simply the 12 LSBs of the Latitude. However, there's a problem there, in that a 12 bit number could be larger than 3200, which is outside the Airborne MSO range.

Therefore, we also need to change the requirement such that at $m = 0$, $R(0) = N(0) \bmod 3200$.

So we end up with:

The Proposed Requirement Clarification:

If $m = 0$, then $R(0) = N(0) \bmod 3200$

If $m \geq 1$, then $R(m) = \{ \textit{the existing equation...} \}$

The Proposed Changes to Table 2-97:

With the above stated clarification to §2.2.6.2.1, the data for Table 2-97 should be the following:

m	N(0)	N(1)	temp	R(m)	MSO
0	2152	570	undefined	2152	2904
1	2152	570	8610722	2722	3474
2	2152	570	10892874	74	826
3	2152	570	296644	2244	2996
4	2152	570	8980396	1196	1948
5	2152	570	4785766	1766	2518
6	2152	570	7067918	2318	3070
7	2152	570	9274888	1288	2040
8	2152	570	5155440	240	992
9	2152	570	960810	810	1562
10	2152	570	3242962	1362	2114
11	2152	570	5449932	332	1084
12	2152	570	1330484	2484	3236
13	2152	570	9939054	3054	3806
14	2152	570	12221206	406	1158
15	2152	570	1624976	2576	3328
16	2152	570	10308728	1528	2280
17	2152	570	6114098	2098	2850
18	2152	570	8396250	2650	3402
19	2152	570	10603220	1620	2372
20	2152	570	6483772	572	1324
21	2152	570	2289142	1142	1894
22	2152	570	4571294	1694	2446
23	2152	570	6778264	664	1416
24	2152	570	2658816	2816	3568
25	2152	570	11267386	186	938
26	2152	570	746338	738	1490
27	2152	570	2953308	2908	3660
28	2152	570	11637060	1860	2612
29	2152	570	7442430	2430	3182
30	2152	570	9724582	2982	3734

Probably only the 'm', R(m), and MSO columns need be included. N(0) and N(1) are constants, and the 'temp' column is only mildly useful.