RTCA Special Committee 209

ATCRBS / Mode S Transponder MOPS Maintenance

Meeting #12

In Joint Session with EUROCAE WG-49
EUROCAE, Malakoff, France
15 – 19 November 2010

General Transponder and ADS-B Out Diagnostic Register

Revision 1

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This Working Paper is provided in response to **Action Item 10-05**.
The Working Paper addresses the concern of having a GICB maintenance register to determine the configuration and status of the Transponder at the time of the request.

Introduction / Discussion:

During SC209 Meeting #12, an Action item was assigned to modify the table contained in WP12-09 to be in the same format as those registers contained in Doc 9871. The table below provides the format desired for register E7.

1	MSB	PURPOSE: To report the configuration and status of the Transponder
2		At any given GICB request.
3		
4	FORMAT TYPE CODE = E,7	The coding of this Register shall conform to:
5		SDI Code **shall** be coded as follows:
6		"00" = Not Used "01" = Side 1
7		"10" = Side 2 "11" = Not Used
8	LSB	
9	MSB "SDI" Code	Non-Diversity Transponder **shall** be coded as follows:
10	LSB	"0" = Diversity
11	Non-Diversity Transponder	"1" = Non-Diversity
12	Diversity Failure	
13	Upper Receiver Failure	Bits 12 through 16, and 24 through 26 **shall** be coded as follows:
14	Lower Receiver Failure	"0" = Ok
15	Upper Squitter Failure	"1" = Failure
16	Lower Squitter Failure	
17	Air/Ground #1 Input Status	Bits 17 through 20, and Bit 23 **shall** be coded as follows:
18	Air/Ground #2 Input Status	"0" = Inactive or Unknown
19	GPS Time Mark #1 Status	"1" = Active
20	GPS Time Mark #2 Status	
21	Mode S Limiting During Power-ON Cycle	Mode S Limiting During Power-ON Cycle **shall** be coded as follows:
22	Mode S Limiting	"0" = No Limiting Event
23	Extended Squitter Disable Status	"1" = Limiting Event
24	TCAS Input Inactive	
25	ADS-B Out Status	Mode S Limiting **shall** be coded as follows:
26	Selected Control Inactive or Failure	"0" = Ok
27	MSB Control Input Selection	"1" = Active (e.g. In Limiting)
28	LSB	
29	MSB Multiple Air Data Source Reporting	Bits 24 through 26 **shall** be coded as follows:
30	LSB Selection (e.g., Source in Use)	"0" = Active
31	Altitude Alternate Port Selection	"1" = Inactive or Failed
32	MSB Altitude Port A Status	
33	LSB	Control Input Selection **shall** be coded as follows:
34	MSB Altitude Port B Status	"00" = Burst Time "01" = Port A or 1
35	LSB	"10" = Port B or 2 "11" = Port C or 3
36	FMC/GNSS Source Select	
37	MSB FMC/GNSS #1 Bus Status	Bits 29 through 30 and 41 through 42 **shall** be coded as follows:
38	LSB	"00" = No Data or Not Used "01" = Source #1 is being Used
39	MSB FMC/GNSS #2 Bus Status	"10" = Source #2 is being used "11" = Source # 3 is being Used
40	LSB	
41	MSB Multiple IRS/AHRS Data Source	Altitude Alternate Port Selection **shall** be coded as follows:
42	LSB Reporting Selection (e.g., source in Use)	"0" = Port A Selected
43	IRS/FMS Source Select	"1" = Alternate Port Selection is Active, e.g., Port B selected
44	MSB IRS/FMS/Data Concentrator In #1	
45	LSB	Bits 32 through 35, 37 through 40, 44 through 47, and 49 through 56
46	MSB IRS/FMS/Data Concentrator In #2	**shall** be coded as follows:
47	LSB	"00" = No Data or Not Used "01" = Active
48	FMC Select	"10" = Inactive "11" = Fail
49	MSB FMC #1/Gen. In Bus Status	
50	LSB	Bits 36, 43, and 48 **shall** be coded as follows:
51	MSB FMC #2/Gen. In Bus Status	"0" = Port #1 Selected
52	LSB	"1" = Port #2 Selected
53	MSB MSP/ATSU/CMU In #1 Status	
54	LSB	
55	MSB MSP/ATSU/CMU In #2 Status	
56	LSB	

Conclusion / Recommendation:

As discussed in the meeting, register E7 will be assigned as per the table above and registers E8 through E9 shall be allocated for future use.

The defined register will be implemented as part of Doc 9871 and ARINC 718A Supplement 3 for future Transponder implementations; consequently, it will impact industry documents DO-181D and ED-73C.