

RTCA Special Committee 186, Working Group 3

ADS-B 1090 MOPS, Revision A

Meeting #3

ACTION ITEM 2-6

1090 MHz ADS-B TCAS RA Broadcast

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SUMMARY

It has been proposed that the contents of the TCAS air-ground Resolution Advisory (RA) downlink message contained in aircraft register 30 Hex be made available as an extended squitter broadcast. This working paper presents an approach for squittering this information via the Extended Squitter Aircraft Status message.

If accepted, changes will need to be developed for sections 2.2, 2.4 and Appendix A.

1.0 Introduction

At the Melbourne meeting, the Working Group agreed to identify a means for making the contents of the TCAS air-ground Resolution Advisory (RA) downlink message (contained in aircraft register 30 Hex) available as an extended squitter broadcast.

2.0 Proposed Approach

2.1 Format Definition

DO-260 defines an Extended Squitter Aircraft Status message. The format for this message contains a three-bit Subtype Code subfield. At present, only Subtype Code = 1 is defined. It identifies the Emergency/Priority Status Message as indicated in Figure A-9 below.

It is proposed that Subtype Code = 2 for this message type be defined for the TCAS RA Broadcast as indicated in Figure A-9A below. In operation, the General Format Manager (GFM) would monitor 30 Hex, the aircraft register used for air-ground transfer of the TCAS RA downlink. When data is inserted in register 30, that same information would be inserted into the TCAS RA broadcast squitter.

2.2 Transmission Rate and Duration

This squitter would be broadcast via the event driven protocol at a rate of once per second for ***TBD*** seconds. The timer is reset and the contents of the TCAS RA broadcast squitter are updated each time that there is a new insertion in register 30 Hex.

2.3 Event Driven Message Priority

The maximum transmission rate for the event driven protocol is twice per second. During the transmission of the once-per-second TCAS RA broadcast squitter any other message transmissions using the event driven protocol would equally share the remaining one squitter per second as specified in A.6.4.3.

If an emergency and a TCAS RA occur at the same time, each would be transmitted at a once-per-second rate and transmission for any other event driven protocol message would be suspended.

2.4 Aircraft Register Assignment

It is normal practice to assign a unique aircraft register to each message format. The purpose is to make it possible for the message data of the squitter to be readout on demand via a ground interrogator or TCAS. The message data in the TCAS RA broadcast squitter is obtained from transponder register 30 Hex. Since ground readout on the RA broadcast can be supported via register 30 Hex, it is not necessary to assign another register for this purpose.

**Figure A-9: Extended Squitter Aircraft Status
(Subtype 1: Emergency/Priority Status)**

BDS 6,1

1	FORMAT TYPE CODE = 28
2	
3	
4	
5	
6	
7	
8	
9	EMERGENCY/PRIORITY STATUS (3 bits)
10	
11	
12	
13	
14	RESERVED
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	RESERVED
34	
35	
36	
37	
38	
39	
40	
41	RESERVED
42	
43	
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Purpose. To provide additional information on aircraft status.

Subtype Coding:

- 0 = No Information
- 1 = Emergency/Priority Status
- 2 = TCAS RA Broadcast
- 3-7 = Reserved

Emergency/Priority Status Coding

<u>Value</u>	<u>Meaning</u>
0	No emergency
1	General emergency
2	Lifeguard/medical
3	Minimum fuel
4	No communications
5	Unlawful interference
6	Reserved
7	Reserved

Notes:

1. Message delivery is accomplished once per second using the event driven protocol.
2. Termination of emergency state is detected by coding in the surveillance status field of the airborne position message.

**Figure A-9A Extended Squitter Aircraft Status
(Subtype 2: TCAS RA Broadcast)**

MB FIELD

1	FORMAT TYPE CODE = 28
2	
3	
4	
5	
6	Subtype Code = 2
7	
8	
9	ACTIVE RESOLUTION ADVISORIES
10	
11	
12	
13	
14	
15	
16	
17	RACs RECORD
18	
19	
20	
21	
22	
23	
24	RA TERMINATED
25	
26	
27	
28	MULTIPLE THREAT ENCOUNTER
29	
30	THREAT-TYPE INDICATOR
31	
32	
33	THREAT IDENTITY DATA
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
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PURPOSE: To report resolution advisories (RAs) generated by TCAS equipment.

- 1) Annex 10, Volume IV, section 4.3.8.4.2.2, contains the full definition of BDS Code 3,0.
- 2) Bit 27 shall mean RA terminated when set to 1.