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DRAFT Quick Reference Summary of Proposed DO-260B 1090ES Messages

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Summary
This Working Paper addresses the request from Meeting #28 in Paris that a brief summary be presented reflecting the proposed changes to the 1090ES ADS-B Messages. The proposed changes are highlighted in yellow.

DO-260B ADS-B Messages

2.2.3.2 ADS-B and TIS-B Message Baseline Format and Structures

Figure 2-2 shows the overall format structure that **shall** be used for ADS-B and TIS-B Messages. The first 5 data bits in each transmission are called the DF (Downlink Format) field, while the next three bits are called:

(1) the CA field if DF = 17, (2) the CF field if DF = 18, or (3) the AF field if DF = 19.

<table>
<tr><th colspan="6">ADS-B and TIS-B Overall Message Format Structures</th></tr>
<tr><td>Bit # →</td><td>1 ------ 5</td><td>6 ------ 8</td><td>9 ------ 32</td><td>33 ------ 88</td><td>89 ------ 112</td></tr>
<tr><td>DF = 17 Field Names →</td><td>DF = 17
[5]</td><td>CA
[3]</td><td>AA
ICAO Address
[24]</td><td>ADS-B Message ME Field
[56]</td><td>PI
[24]</td></tr>
<tr><td rowspan="8">DF = 18 Field Names →</td><td rowspan="8">DF = 18
[5]</td><td>CF = 0
[3]</td><td>AA
ICAO Address
[24]</td><td rowspan="2">ADS-B Message ME Field
[56]</td><td rowspan="2">PI
[24]</td></tr>
<tr><td>CF = 1
[3]</td><td>AA
non-ICAO Address
[24]</td></tr>
<tr><td>CF = 2 to 3
[3]</td><td>AA
[24]</td><td>TIS-B Message ME Field
[56]</td><td>PI
[24]</td></tr>
<tr><td>CF = 4
[3]</td><td colspan="2">TIS-B and ADS-R
Management Messages</td><td>PI
[24]</td></tr>
<tr><td>CF = 5
[3]</td><td>AA
non-ICAO Address
[24]</td><td>TIS-B Message ME Field
[56]</td><td rowspan="3">PI
[24]</td></tr>
<tr><td>CF = 6
[3]</td><td colspan="2">Rebroadcast of an ADS-B Message from an alternate data link using the same TYPE Codes and Message Formats as are defined for DF=17 ADS-B Messages</td></tr>
<tr><td>CF = 7</td><td colspan="2">Reserved</td></tr>
<tr><td rowspan="2">DF = 19 Field Names→</td><td rowspan="2">DF = 19
[5]</td><td>AF = 0
[3]</td><td>AA
ICAO Address
[24]</td><td>ADS-B Message ME Field
[56]</td><td>PI
[24]</td></tr>
<tr><td>AF = 1 to 7
[3]</td><td colspan="3">Reserved for Military Applications</td></tr>
<tr><td></td><td>MSB LSB</td><td>MSB LSB</td><td>MSB LSB</td><td>MSB LSB</td><td>MSB LSB</td></tr>
</table>

Figure 2-2: ADS-B and TIS-B Message Baseline Format Structure

Notes for Figure 2-2:

1. *"[#]" provided in a field indicates the number of bits in the field.*
2. *DF = 19 messages are intended for Military Applications systems only.*

3. *For DF=19, if the AF field is equal to 0, then bits 9-32 are used for the AA field, bits 33-88 are used for the ME field, and bits 89-112 are used for the PI field. If the AF field is not 0 (that is, is in the range 1 to 7) then bits 9-112 are used for the "Reserved for Military Applications" field. (This format is reserved for military use only.)*

2.2.3.2.3 ADS-B Airborne Position Messages

Format for the Airborne Position Message "ME" field contents **shall** be as specified in Figure 2-3. Each of the subfields is specified in the following subparagraphs.

Airborne Position Message "ME" Field								
MSG BIT #	33 -37	38 ---------- 39	40	41 ----- 52	53	54	55 ---- 71	72 ---- 88
"ME" BIT #	1 – 5	6 ---------- 7	8	9 ----- 20	21	22	23 --- 39	40 --- 56
FIELD NAME	**TYPE [5]**	**SURVEILLANCE STATUS [2]**	**NIC Supplement [1]**	**ALTITUDE [12]**	**TIME (T) [1]**	**CPR FORMAT (F) [1]**	**CPR ENCODED LATITUDE [17]**	**CPR ENCODED LONGITUDE [17]**
	MSB LSB	MSB LSB		MSB LSB			MSB LSB	MSB LSB

Note: *"[#]" provided in the Field indicates the number of bits in the field.*

Figure 2-3: ADS-B Airborne Position Message Format

2.2.3.2.4 ADS-B Surface Position Messages

The format for the Surface Position Message "ME" field contents is specified in Figure 2-5. Each of the subfields is specified in the following subparagraphs.

Surface Position Message "ME" Field								
MSG BIT #	33 - 37	38 - 44	45	46 - 52	53	54	55 - 71	72 - 88
"ME" BIT #	1 - 5	6 - 12	13	14 - 20	21	22	23 - 39	40 – 56
FIELD NAME	**TYPE [5]**	**MOVEMENT [7]**	**HEADING/ GROUND TRACK STATUS [1]**	**HEADING/ GROUND TRACK [7]**	**TIME (T) [1]**	**CPR FORMAT (F) [1]**	**ENCODED LATITUDE [17]**	**ENCODED LONGITUDE [17]**
	MSB LSB	MSB LSB		MSB LSB			MSB LSB	MSB LSB

Note: *"[#]" provided in the Field indicates the number of bits in the field.*

Figure 2-5: ADS-B Surface Position Message Format

2.2.3.2.5 ADS-B Aircraft Identification and Category Messages

Format for the Aircraft Identification and Category Message "ME" field contents is specified in Figure 2-6. Each of the subfields is specified in the following subparagraphs.

Aircraft Identification and Category Message "ME" Field										
MSG BIT #	33 - 37	38 -- 40	41 - 46	47 - 52	53 - 58	59 - 64	65 - 70	71 - 76	77 - 82	83 – 88
"ME" BIT #	1 - 5	6 - 8	9 - 14	15 - 20	21 - 26	27 - 32	33 - 38	39 - 44	45 - 50	51 - 56
FIELD NAME	**TYPE [5]**	**ADS-B EMITTER CATEGORY [3]**	**Ident Char. #1 [6]**	**Ident Char. #2 [6]**	**Ident Char. #3 [6]**	**Ident Char. #4 [6]**	**Ident Char. #5 [6]**	**Ident Char. #6 [6]**	**Ident Char. #7 [6]**	**Ident Char. #8 [6]**
	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB

Note: *"[#]" provided in the Field indicates the number of bits in the field.*

Figure 2-6: ADS-B Aircraft Identification and Category Message Format

2.2.3.2.6 ADS-B Airborne Velocity Messages

Formats for the various Airborne Velocity Messages are further classified by subtype as identified in the following subparagraphs and Figure 2-7 and Figure 2-8.

Airborne Velocity Message SUBTYPE "1" and "2" "ME" Field															
MSG BIT #	33 - 37	38 - 40	41	42	43 - 45	46	47 - 56	57	58 - 67	68	69	70 - 78	79 - 80	81	82 – 88
"ME" BIT #	1 - 5	6 - 8	9	10	11 - 13	14	15 - 24	25	26 - 35	36	37	38 - 46	47 - 48	49	50 – 56
FIELD NAME	TYPE [5]	SUBTYPE [3]	Intent Change Flag [1]	Spare [1]	NAC_V [3]	E/W Direction Bit [1]	E/W Velocity [10]	N/S Direction Bit [1]	N/S Velocity [10]	Vert Rate Source [1]	Vert Rate Sign [1]	Vert Rate [9]	Reserved [2]	Diff from Baro Alt Sign [1]	Diff from Baro Alt [7]
	MSB LSB	MSB LSB			MSB LSB		MSB LSB		MSB LSB			MSB LSB	MSB LSB		MSB LSB

<u>Figure 2-7:</u> ADS-B Airborne Velocity Message Subtype "1&2"

Airborne Velocity Message SUBTYPE "3" and "4" "ME" Field															
MSG BIT #	33 - 37	38 - 40	41	42	43 - 45	46	47 - 56	57	58 - 67	68	69	70 - 78	79 - 80	81	82 – 88
"ME" BIT #	1 - 5	6 - 8	9	10	11 - 13	14	15 - 24	25	26 - 35	36	37	38 - 46	47 - 48	49	50 – 56
FIELD NAME	TYPE [5]	SUBTYPE [3]	Intent Change Flag [1]	Spare [1]	NAC_V [3]	Heading Status Bit [1]	Heading [10]	Airspeed Type [1]	Airspeed [10]	Vert Rate Source [1]	Vert Rate Sign [1]	Vert Rate [9]	Reserved [2]	Diff from Baro Alt Sign [1]	Diff from Baro Alt [7]
	MSB LSB	MSB LSB			MSB LSB		MSB LSB		MSB LSB			MSB LSB	MSB LSB		MSB LSB

<u>Figure 2-8:</u> ADS-B Airborne Velocity Message Subtype "3&4"

<u>Note:</u> *The "[#]" provided in the Field description columns of Figure 2-7 and Figure 2-8 indicates the number of bits in the respective FIELD.*

2.2.3.2.7.1.3 Target State and Status (SUBTYPE=0 Format)

"Target State and Status" information is conveyed by the Target State and Status Message (TYPE=29) when the SUBTYPE=ONE (1). The format of the Target State and Status Message **shall** as be in accordance with Figure 2-10.

MSG Bit #	33 ----- 37	38 ----- 39	40	41	42 ----------52	53 ---------- 61
"ME" Bit #	1 ------ 5	6 ----- 7	8	9	10 ---------- 20	21 ---------- 29
Field Name	TYPE Code =29 (1 1 1 0 1) [5]	Subtype=1 (0 1) [2]	SIL Supp [1]	Selected Altitude Type [1]	MCP/FCU Selected Altitude ***or*** FMS Selected Altitude [11]	Barometric Pressure Setting (Minus 800 millibars) [9]
	MSB LSB	MSB LSB			MSB LSB	MSB LSB

MSG Bit #	62	63	64 ---------- 71	72 ----------75	76	77 ---------- 78
"ME" Bit #	30	31	32 ---------- 39	40 ---------- 43	44	45 ---------- 46
Field Name	Selected Heading Status [1]	Selected Heading Sign [1]	Selected Heading [8]	Navigation Accuracy Category_Position (NAC_P) [4]	Navigation Integrity Category_Baro (NIC_{BARO}) [1]	Source Integrity Level (SIL) [2]
			MSB LSB	MSB LSB		MSB LSB

MSG Bit #	79	80	81	82	83	84	85	86 -------- 88
"ME" Bit #	47	48	49	50	51	52	53	54 -------- 56
Field Name	Status of MCP / FCU Mode Bits [1]	Autopilot Engaged [1]	VNAV Mode Engaged	Altitude Hold Mode [1]	Reserved For ADS-R Flag [1]	Approach Mode [1]	TCAS Operational [1]	Reserved [3]
								MSB LSB

Figure 2-10: "Target State and Status Message" (SUBTYPE=1 Format)

2.2.3.2.7.2 "Aircraft Operational Status" Messages

The "Aircraft Operational Status Message" is used to provide the current status of the aircraft. The format of the Aircraft Operational Status Message **shall** be as specified in Figure 2-11, while further definition of each of the subfields is provided in the subsequent paragraphs.

Aircraft Operational Status ADS-B Message "ME" Field Format														
MSG BIT #	33 - 37	38 - 40	41 - 52	53 - 56	57 - 72	73 - 75	76	77 - 80	81 - 82	83 - 84	85	86	87	88
"ME" BIT #	1 - 5	6 - 8	9 - 20	21 - 24	25 - 40	41 - 43	44	45 - 48	49 - 50	51 - 52	53	54	55	56
FIELD NAME	**TYPE=31 [5]**	**Subtype=0 [3]**	**Capability Class (CC) Codes [16]**		**Operational Mode (OM) Codes [16]**	**MOPS Version Number [3]**	**NIC Supp. [1]**	**NAC_P [4]**	**GVAQ [2]**	**Source Integrity Level (SIL) [2]**	**NIC_{BARO} [1]**	**HRD [1]**	**SIL Supp [1]**	**Reserved [1]**
		Subtype=1 [3]	**CC Codes [12]**	**L/W Codes [4]**					**Reserved [2]**		**TRK/HDG [1]**			
	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB		MSB LSB	MSB LSB	MSB LSB				

Note: *Subfields that are relevant only for Airborne Participants are allocated to Subtype ZERO (binary 000), while those that pertain only to Surface Participants are allocated to Subtype ONE (binary 001).*

Figure 2-11: "Aircraft Operational Status" ADS-B Message "ME" Field Format

Table 2-60: Airborne Capability Class (CC) Code Format in Version 2 Transmitting Subsystems.

Msg Bit #	41	42	43	44	45	46	47	48	49	50	51 -- 56
"ME" Bit #	9	10	11	12	13	14	15	16	17	18	19 -- 24
Content	**Service Level** MSBs = 0 0		**UAT IN**	**1090 IN**	**Service Level** LSBs = 0 0		**ARV**	**TS**	**TC**		**Reserved**

Notes for Table 2-60:

1. UAT IN = Aircraft has UAT Receive Capability
2. 1090ES IN = Aircraft has 1090ES Receive Capability
3. ARV = "ARV Report Capability"
4. TS = "TS Report Capability"
5. TC = "TC Report Capability Level"
6. Reserved = "Reserved for standardization in future versions of these MOPS"

Table 2-61: Surface Capability Class (CC) Code Format in Version 2 Transmitting Subsystems.

Msg Bit #	41	42	43	44	45	46	47	48	49 – 51	52
"ME" Bit #	9	10	11	12	13	14	15	16	17 – 19	20
Content	**Service Level** MSBs = 0 0		**POA**	**1090 IN**	**Service Level** LSBs = 0 0		**B2 Low**	**UAT IN**	**NAC_V [3]**	**Reserved [1]**

Notes for Table 2-61:

1. *1090ES IN = Aircraft has 1090ES Receive Capability*
2. *POA = "Position Offset Applied"*
3. *B2 Low = 1 if Class B2 Ground Vehicle is transmitting with less than 70 watts*
4. *UAT IN = Aircraft has UAT Receive Capability*
5. *NAC_V = Navigation Accuracy Category for Velocity*
6. *Reserved = "Reserved for standardization in future versions of these MOPS"*

Table 2-68: Operational Mode (OM) Subfield Format

Msg Bit #	57	58	59	60	61	62	63 -- 64	65 -- 72
"ME" Bit #	25	26	27	28	29	30	31 – 32	33 – 40
OM Format	0 0		TCAS RA Active [1]	IDENT Switch Active [1]	Reserved for Receiving ATC Services [1]	Single Antenna Flag [1]	System Design Assurance [2]	Reserved [8]
	0 1		Reserved					
	1 0		Reserved					
	1 1		Reserved					

2.2.3.2.7.3.1 "TEST" Messages with SUBTYPE=0

"TEST" Messages with SUBTYPE=0 **shall** be used only for messages in support of bench and/or certification testing of 1090 MHz ADS-B systems. The format for "TEST" Messages with SUBTYPE=0 **shall** be shown in Figure 2-12.

"TEST" Message (TYPE=23 and SUBTYPE=0)			
MSG Bit #	33 ---------- 37	38 ---------- 40	41 ---------- 88
"ME" Bit #	1 ---------- 5	6 ---------- 8	9 ---------- 56
Field Name	**TYPE=23 [5]**	**SUBTYPE=0 [3]**	**Unformatted Test Data [48]**
	MSB LSB	MSB LSB	MSB LSB

Figure 2-12: "TEST" Message with SUBTYPE=0 Format

2.2.3.2.7.8 Extended Squitter Aircraft Status Messages (TYPE "28")

2.2.3.2.7.8.1 Emergency / Priority Status (Subtype = 1)

The Extended Squitter Aircraft Status Message (TYPE "28") is used to provide additional information regarding aircraft status. Subtype "1" is used specifically to provide Emergency / Priority status and to broadcast the Mode A Code. Specific formatting of the TYPE "28," Subtype "1" is specified in Appendix A, Figure A-8 and in Figure 2-14.

"1090ES Aircraft Status Message (Emergency/Priority Status) (TYPE=28, Subtype=1)"					
Msg Bit #	33 ----- 37	38 ------ 40	41 -------- 43	44 --------- 56	57 ---------- 88
"ME" Bit #	1 ------- 5	6 -------- 8	9 --------- 11	12 --------- 24	25 ---------- 56
Field Name	TYPE=28 [5]	Subtype=1 [3]	Emergency/ Priority Status [3]	Mode A Code [13]	Reserved [45]
	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB

Figure 2-14: Extended Squitter Aircraft Status Message (TYPE=28)

2.2.3.2.7.8.2 1090ES TCAS Resolution Advisory (RA) Broadcast Message (Subtype=2)

The Extended Squitter Aircraft Status Message (TYPE "28") is also used to provide additional information regarding the TCAS Resolution Advisory (RA). Subtype=2 is used specifically to provide the encoding of this information as specified in Figure 2-14A. The content of the fields of the 1090ES TCAS RA Message conform to the corresponding bits of transponder Register 30_{16}, and are specified in ICAO Annex 10, Vol IV, §4.3.8.4.2.2.1.

1090ES Aircraft Status Message (TCAS RA Broadcast Message) (TYPE=28, Subtype=2)								
Message Bit #	33 – 37	38 – 40	41 – 54	55 – 58	59	60	61 – 62	63 – 88
"ME" Bit #	1 – 5	6 – 8	9 – 22	23 – 26	27	28	29 – 30	31 – 56
Field Name	TYPE=28 [5]	Subtype=2 [3]	Active Resolution Advisories (ARA) [14]	RACs Record [4]	RA Terminated (RAT) [1]	Multiple Threat Encounter (MTE) [1]	Threat Type Indicator (TTI) [2]	Threat Identity Data (TID) [26]
	MSB LSB	MSB LSB	MSB LSB	MSB LSB			MSB LSB	MSB LSB

Note: *"[#]" provided in a field indicates the number of bits in that field.*

Figure 2-14A: 1090ES Aircraft Status Message (TCAS RA Broadcast Message) (TYPE=28, Subtype 2)

a. The transmission of the Aircraft Status Message with Subtype=2 **shall** begin within 0.5 seconds after the transponder notification of the initiation of a TCAS Resolution Advisory.

b. The transmission of the Aircraft Status Message with Subtype=2 **shall** be terminated 24 +/- 1 seconds after the Resolution Advisory Termination (RAT) flag transitions from ZERO (0) to ONE (1).

c. Aircraft Status Messages with Subtype=2 **shall** have priority over Aircraft Status Messages with Subtype=1, and over all other Event-Driven Messages.

Table 2-16: "TYPE" Subfield Code Definitions (DF = 17 or 18)

TYPE Code	Subtype Code	NIC Supplement	Format (Message Type)	Horizontal Containment Radius Limit (R_C)	Navigation Integrity Category (NIC)	Altitude Type	Notes
0	Not Present	*Not Applicable*	No Position Information (**Airborne or Surface Position Messages**)	R_C unknown	NIC = 0	Baro Altitude or No Altitude Information	1, 2, 3
1	Not Present	*Not Applicable*	**Aircraft Identification and Category Message** (§)	*Not Applicable*	*Not Applicable*	*Not Applicable*	Category Set D
2							Category Set C
3							Category Set B
4							Category Set A
5	Not Present	0	**Surface Position Message** (§)	R_C < 7.5 m	NIC = 11	No Altitude Information	
6		0		R_C < 25 m	NIC = 10		
7		1		R_C < 75 m	NIC = 9		6
		0		R_C < 0.1 NM (185.2 m)	NIC = 8		
8		1		R_C < 0.2 NM (370.4 m)	NIC = 7		
		0		$R_C \geq$ 0.2 NM (370.4 m) or unknown	NIC = 0		
9	Not Present	0	**Airborne Position Message** (§)	R_C < 7.5 m	NIC = 11	Baro Altitude	5
10		0		R_C < 25 m	NIC = 10		5
11		1		R_C < 75 m	NIC = 9		5, 6
		0		R_C < 0.1 NM (185.2 m)	NIC = 8		
12		0		R_C < 0.2 NM (370.4 m)	NIC = 7		
13		1		R_C < 0.6 NM (1111.2 m)	NIC = 6		
		0		R_C < 0.5 NM (926 m)			
14		0		R_C < 1.0 NM (1852 m)	NIC = 5		
15		0		R_C < 2 NM (3.704 km)	NIC = 4		
16		1		R_C < 4 NM (7.408 km)	NIC = 3		7
		0		R_C < 8 NM (14.816 km)	NIC = 2		
17		0		R_C < 20 NM (37.04 km)	NIC = 1		
18		0		$R_C \geq$ 20 NM (37.04 km) or unknown	NIC = 0		
19	0	*Not Applicable*	Reserved	*Not Applicable*	*Not Applicable*	Difference between "Baro Altitude" and "GNSS Height (HAE)"	
	1 – 4		**Airborne Velocity Message** (§)				
	5 – 7		Reserved				
20	Not Present	0	**Airborne Position Message** (§)	R_C < 7.5 m	NIC = 11	GNSS Height (HAE)	2, 5
21		0		R_C < 25 m	NIC = 10		2, 5
22		0		$R_C \geq$ 25 m or unknown	NIC = 0		2

Table 2-16: "TYPE" Subfield Code Definitions (DF = 17 or 18) (Continued)

TYPE Code	Subtype Code	NIC Supplement	Format (Message Type)
23	0	*Not Applicable*	**Test Message** (§)
	1 – 7		Reserved
24	0		**Reserved**
	1		**Surface System Status** (§) (Allocated for National Use)
	2 – 7		**Reserved**
25 – 26			**Reserved** (§and §)
27			**Reserved for Trajectory Change Message** (§)
28	0		Reserved
	1		**Extended Squitter Aircraft Status Message (Emergency/Priority Status)** (§)
	2		**Extended Squitter Aircraft Status Message (1090ES TCAS RA Message)** (§)
	3 – 7		Reserved
29	0		Target State and Status Message (ADS-B Version Number=1, defined in RTCA DO-260A)
	1		**Target State and Status Message** (§) (ADS-B Version Number=2, defined in these MOPS, RTCA DO-260B)
	2 – 3		Reserved
30	0 – 7		Reserved
31	0 – 1		**Aircraft Operational Status Message** (§)
	2 – 7		Reserved

Notes for Table 2-16:

1. *"Baro Altitude" means barometric pressure altitude, relative to a standard pressure of 1013.25 millibars (29.92 in.Hg.). It does **not** mean baro corrected altitude.*

2. *TYPE codes 20 to 22 or TYPE Code 0 are to be used when valid "Baro Altitude" is not available.*

3. *After initialization, when horizontal position information is not available but altitude information is available, the Airborne Position Message is transmitted with a TYPE Code of ZERO in bits 1-5, the barometric pressure altitude in bits 9 to 20, and bits 22 to 56 set to ZERO (0). If neither horizontal position nor barometric altitude information is available, then all 56 bits of register 0,5 are set to zero. The ZERO (0) TYPE Code field indicates that latitude and longitude information is not available, while the Zero altitude field indicates that altitude information is not available. (See Appendix A).*

4. *If the position source is an ARINC 743A GNSS receiver, then the ARINC 429 data "label 130" data word from that receiver is a suitable source of information for R_C, the horizontal integrity containment radius. (The label 130 data word is variously called HPL (Horizontal Protection Limit) or HIL (Autonomous Horizontal Integrity Limit) in different documents.*

5. *This TYPE Code value implies limits for the R_C (horizontal containment limit). If this limit is not satisfied, then a different value for the TYPE Code should be selected.*

6. *The "NIC Supplement" field in the Airborne Position Message (§) and in the Aircraft Operational Status Message (§) enables the Report Assembly Function in ADS-B Receiving Subsystem to determine whether the ADS-B Transmitting Subsystem is announcing NIC=8 (R_C < 0.1 NM) or NIC=9 (R_C < 75 m).*

7. *The "NIC Supplement" field in the Airborne Position Message (§) and in the Aircraft Operational Status Message (§) enables the Report Assembly Function in ADS-B Receiving Subsystem to determine whether the ADS-B Transmitting Subsystem is announcing NIC=2 (R_C < 8 NM) or NIC=3 (R_C < 4 NM).*

8. *Future versions of these MOPS may limit transmission of Surface Position Messages at lower NIC and/or NAC_P values for Transponder-Based systems.*

Table 2-77: 1090 MHz Extended Squitter ADS-B Message Broadcast Rates

Transponder Register	Event-Driven Message Priority	1090ES ADS-B Message	Broadcast Rate: On-the-Ground, not moving	Broadcast Rate: On-the-Ground and moving	Broadcast Rate: Airborne
BDS 0,5	N/A	Airborne Position	N/A	N/A	2 / 1 second (0.4 – 0.6 sec)
BDS 0,6	N/A	Surface Position	LOW RATE 1 / 5 seconds (4.8 – 5.2 sec)	HIGH RATE 2 / 1 second (0.4 – 0.6 sec)	N/A
BDS 0,8	N/A	Aircraft Identification and Category	LOW RATE 1 / 10 seconds (9.8 – 10.2 sec)	HIGH RATE 1 / 5 seconds (4.8 – 5.2 sec)	1 / 5 seconds (4.8 – 5.2 sec)
BDS 0,9	N/A	Airborne Velocity	N/A	N/A	2 / 1 second (0.4 – 0.6 sec)
BDS 6,1	TCAS RA = 1 Emergency = 2	Aircraft Status (Emergency/Priority Status, Subtype=1) (TCAS RA Broadcast, Subtype=2)	TCAS RA or Mode A Code Change or Emergency 0.7 – 0.9 seconds		
			No TCAS RA, No Mode A Change, No Emergency 4.8 – 5.2 seconds		
BDS 6,2	N/A	Target State and Status (TSS)	N/A	N/A	1.2 – 1.3 seconds
BDS 6,5	N/A	Aircraft Operational Status	4.8 – 5.2 seconds	No Change in NIC_{SUPP}/NAC/SIL 2.4 – 2.6 seconds	TSS being broadcast or not No change TCAS/NAC/SIL 2.4 – 2.6 seconds
				Change in NIC_{SUPP}/NAC/SIL 0.7 – 0.9 seconds	TSS being broadcast Change in TCAS/NAC/SIL 2.4 – 2.6 seconds
					TSS not broadcast[2] Change in TCAS/NAC/SIL 0.7 – 0.9 seconds

N/A = Not Applicable

Notes:

1. *Transmitters are limited to no more than 2 Event Driven messages per second. Therefore, the average of 2 Airborne Position, 2 Airborne Velocity, 0.2 Identification, and 2 Periodic Status and Event Driven messages per second, averaged over any 60 second interval, yields the required 6.2 messages per second.*
2. *Not all aircraft broadcast the Target State and Status Message (Table 2-3).*