

RTCA Special Committee 186, Working Group 5

ADS-B UAT MOPS

Meeting #18 (Telecon)

**Proposed Updated Test Procedure
for Sync Detection Logic Requirement (§2.2.8.3.3)**

**Presented by
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SUMMARY

In response to Action Item 17-01, this document proposes a replacement test procedure for the requirements for ADS-B message synchronization trigger processing (§2.4.8.3.3).

Introduction

The adoption of UAT-WP-17-02 (§2.2.8.2.7 “Sync Trigger Processing Rate”) and its Test Procedure (§2.4.8.2.7) allow for the simplification of the Test Procedure for verification of the requirements for receiver processing of ADS-B Sync triggers found in §2.2.8.3.3. Since the rate of sync triggers is now a clearly defined and separate requirement, the existing text procedure in §2.4.8.3.3 can be substantially simplified to only validate the sync detection logic.

Proposed Test Procedure

2

2.4 Test Procedures

2.4.8

2.4.8.3

2.4.8.3.3 Verification of Receiver Processing of ADS-B Synchronization “Trigger” (§2.2.8.3.3)

((no change to Purpose/Introduction subparagraphs a., b., c., or the Notes)))

Equipment Required:

Provide a method of supplying the UUT with a single source of desired bit patterns, each of which contains at least one complete valid Long ADS-B message. The content of the messages shall be selected from among the following three Data Sets, as specified in the test procedure Steps. The rate of message generation should be selected to allow for convenient measurement.

These Data Sets define what may be considered the entire time span of up to three overlapping Long ADS-B Messages. Each Data Set begins with the ADS-B Sync pattern (right-justified to 5 bytes as 0x0EACDDA4E2), and ends with a valid FEC encoding parity field that is calculated over only the final 34 payload bytes immediately preceding it. Data Sets 2 and 3 contain at least one additional embedded Sync pattern. Bytes labeled 'PN' may be filled with pseudo-random data as necessary. The Parity bytes are labeled 'P1' through 'P14'.

Data Set 1 consists of a Long ADS-B message whose payload content includes the ADS-B Sync pattern. One such pattern is listed below.

| Byte # | Data | | | | | | | |
|--------|------|------|------|------|------|----|----|----|
| 1-8 | 0x0E | 0xAC | 0xDD | 0xA4 | 0xE2 | PN | PN | PN |
| 9-16 | PN | PN | PN | PN | PN | PN | PN | PN |
| 17-24 | PN | PN | PN | PN | PN | PN | PN | PN |
| 25-32 | PN | PN | PN | PN | PN | PN | PN | PN |

| Byte # | Data | | | | | | | |
|--------|------|------|------|------|------|----|----|----|
| 33-40 | 0x0E | 0xAC | 0xDD | 0xA4 | 0xE2 | PN | PN | P1 |
| 41-48 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 |
| 49-53 | P10 | P11 | P12 | P13 | P14 | | | |

Data Set 2 consists of an ADS-B Sync pattern, followed by 11 bytes of PN data, followed by a valid Long ADS-B message. One such pattern is listed below. The Parity field is computed over Bytes 22 through 55.

| Byte # | Data | | | | | | | |
|--------|------|------|------|------|------|----|----|----|
| 1-8 | 0x0E | 0xAC | 0xDD | 0xA4 | 0xE2 | PN | PN | PN |
| 9-16 | PN | PN | PN | PN | PN | PN | PN | PN |
| 17-24 | 0x0E | 0xAC | 0xDD | 0xA4 | 0xE2 | PN | PN | PN |
| 25-32 | PN | PN | PN | PN | PN | PN | PN | PN |
| 33-40 | PN | PN | PN | PN | PN | PN | PN | PN |
| 41-48 | PN | PN | PN | PN | PN | PN | PN | PN |
| 49-56 | PN | PN | PN | PN | PN | PN | PN | P1 |
| 57-64 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 |
| 65-69 | P10 | P11 | P12 | P13 | P14 | | | |

Data Set 3 consists of an ADS-B Sync pattern, followed by 11 bytes of data, followed by a second ADS-B Sync pattern, followed by 11 bytes of data, followed by a valid Long ADS-B message. One such pattern is listed below. The Parity field is computed over Bytes 38 through 66.

| Byte # | Data | | | | | | | |
|--------|------|------|------|------|------|----|----|----|
| 1-8 | 0x0E | 0xAC | 0xDD | 0xA4 | 0xE2 | PN | PN | PN |
| 9-16 | PN | PN | PN | PN | PN | PN | PN | PN |
| 17-24 | 0x0E | 0xAC | 0xDD | 0xA4 | 0xE2 | PN | PN | PN |
| 25-32 | PN | PN | PN | PN | PN | PN | PN | PN |

| Byte # | Data | | | | | | | |
|--------|------|------|------|------|------|----|----|----|
| 33-40 | 0x0E | 0xAC | 0xDD | 0xA4 | 0xE2 | PN | PN | PN |
| 41-48 | PN | PN | PN | PN | PN | PN | PN | PN |
| 49-56 | PN | PN | PN | PN | PN | PN | PN | PN |
| 57-64 | PN | PN | PN | PN | PN | PN | PN | PN |
| 65-72 | PN | PN | PN | PN | PN | PN | PN | P1 |
| 73-80 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 |
| 81-85 | P10 | P11 | P12 | P13 | P14 | | | |

Measurement Procedures:

Step 1: Verification of subparagraph a. (Initial trigger processing completed)

Configure the message source to generate Data Set 1.

Verify that at least 10 messages from Data Set 1 are successfully received.

Step 2: Verification of subparagraph b. (Second trigger processing completed)

Configure the message source to generate Data Set 2.

Verify that at least 10 messages from Data Set 2 are successfully received.

Step 3: Verification of subparagraph c. (Third trigger processing completed)

Configure the message source to generate Data Set 3.

Verify that at least 10 messages from Data Set 3 are successfully received.

(((end of proposed Test Procedure)))