

Notes:

1. The different values across equipment classes reflect the fact that Class A3 receivers will utilize a narrow filter that degrades demodulation performance slightly in order to gain added rejection from adjacent channel DME ground stations.
2. Signal values ensure both the desired and undesired signal levels are above the noise floor.

2.2.8.2.6 Rate of False “Trigger”

- a. With no signal input, the ADS-B Receiver **shall** experience no more than 50 ADS-B Message triggers per second.
- b. With no signal input, the ADS-B Receiver **shall** experience no more than 2 Ground Uplink Message triggers per minute.

Note: Detection of either the ADS-B or Ground Uplink synchronization sequence is referred to as a “trigger.”

2.2.8.2.7 Trigger Processing Rate

Receiver trigger processing rate requirements are as follows:

- a. Equipment Classes A3, A2 and A1H receivers **shall** be capable of successfully processing at least 1000 trigger events per second.
- b. Equipment Classes A1L and A0 receivers **shall** be capable of successfully processing at least 900 trigger events per second.

2.2.8.3 Receiver Message Processing**2.2.8.3.1 Criteria for Successful Message Reception****2.2.8.3.1.1 ADS-B Messages**

Upon detection of the ADS-B synchronization sequence, the receiver **shall** decode the ADS-B Message according to the procedure specified below:

- a. The receiver **shall** attempt to decode the message in the Long format using hard decision decoding with no erasures allowed. The decoder **shall** correct no more than 7 errors. If the RS decoder determines that there are no residual errors after completing the decoding process, ~~AND any of the first 5 bits of the payload (the “PAYLOAD TYPE CODE” field) has a non-ZERO value~~, then a Successful Message Reception **shall** be declared.
- b. Otherwise, the receiver **shall** attempt to decode the message in the Basic format using hard decision decoding with no erasures allowed. The decoder **shall** correct no more than 6 errors. If the RS decoder determines that there are no residual errors after completing the decoding process, AND the first 5 bits of the payload (the “PAYLOAD TYPE CODE” field) are ALL ZEROS, AND the Long decoding process fails, then a Successful Message Reception **shall** be declared.
- c. Otherwise, no message reception **shall** be declared.

Notes:

1. This procedure discriminates the Basic vs. Long message format by using the characteristics of the RS code without an explicit length indicator.
2. To avoid misinterpreting the contents of Long Message reception declared to be successful, the receiver should discard any Message that has a "PAYLOAD TYPE CODE" field equal to ZERO. See Appendix M for the probability of such an event occurring (the probability is less than 10^{-9}).
- 2.3. Appendix M provides the analytic determination of the Undetected Message Error Rate (UMER) achieved through use of the RS coding. Due to the straightforward calculation of the UMER and the fact that the UMER is quite low, no explicit requirement/test is needed for a "False Message Reception Rate" test.

2.2.8.3.1.2 Ground Uplink Messages

The receiver **shall** determine Successful Message Receipt for a Ground Uplink Message according to the following procedure:

- a. Each de-interleaved RS block of the Ground Uplink Message **shall** be individually examined for errors. Each RS block **shall** be declared as valid only if it contains NO uncorrected error after RS decoding. The decoding process **shall** use hard decision decoding with no erasures allowed.
- b. Successful Message reception **shall** be declared for a Ground Uplink Message when all six constituent RS blocks are declared valid from (a) above.

Note: *Appendix M provides the analytic determination of the Undetected Message Error Rate achieved through use of the RS coding. Due to the straightforward calculation of the UMER and the fact that the UMER is quite low, no explicit requirement/test is needed for a "False Message Reception Rate" test.*

2.2.8.3.2 Receiver Discrimination Between ADS-B and Ground Uplink Message Types

The receiver **shall** determine the message type by means of the correlation between the received bits, and the synchronization sequences given in §2.2.3.1.1 and §2.2.3.2.1.

Note: *Specifically, the receiver should not attempt to distinguish ADS-B Messages from Ground Uplink Messages by their position in the UAT frame.*

2.2.8.3.3 Receiver Processing of ADS-B Synchronization "Trigger"

Receivers **shall** meet the following message processing requirements:

- a. When an initial ADS-B trigger occurs (no message decode in progress), the decode process associated with this trigger **shall** be completed regardless of other trigger activity subsequently detected.
- b. The decode process associated with a second, subsequent ADS-B trigger event that occurs during the Message Reception process of an initial ADS-B trigger event **shall** also be completed regardless of other trigger activity subsequently detected.