

RTCA Special Committee 186, Working Group 5

ADS-B UAT MOPS Maintenance

Meeting #26

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Proposed Addition Verification for Latency
Revision 1

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Summary

This Working Paper addresses additional test procedures for Total Latency.
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2.4.7.2.4 Verification of Total Latency of Position Measurements

Purpose/Introduction

The purpose of this test is to verify that the UAT Transmit Subsystem induces a latency of no more than 1.5 seconds from the time of applicability of the position data input to the UAT to the time the corresponding message is transmitted.

Measurement Procedure

For this test, a capability is required to generate a test stimulus ownship track that contains a large acceleration such as a continuous turn of at least 0.5g with registered position and velocity output at one second periodic intervals. The test stimulus should use a NIC and NACp consistent with the non-precision condition. Additionally, the setup needs to output a 1 pps Time Mark signal [300] ms (+/- 10ms) in advance of the position and velocity data being available to the UAT under test. This signal represents the UTC epoch—but need not be the actual UTC second. It also represents the Time of Applicability of Position and Velocity of the test stimulus ownship track.

Step 1: Test Setup

Hook up the test track stimulus to the UAT under test along with the 1 pps signal. Allow the UAT transmitter to run for 60 seconds in order that a mix of MSOs is selected. Set up a recorder to capture all the following at the input to the UAT under test: the baseband track stimulus, the 1pps signal, and the output of a separate UAT receiver, to capture the messages transmitted. All recordings must include a timestamp from a common clock or synchronized clocks.

Step 2: Data Analysis

From the recordings, verify that for all transmitted messages, the total latency of the position data in the message is no greater than 1.5 seconds. This is verified by confirming that there is no error due to the affects of the acceleration by comparing the received message with the corresponding update of the test stimulus ownship track.