

**RTCA Special Committee 186, Working Group 3**

**ADS-B 1090 MOPS**

**Meeting #4**

**Consideration of the need to run cases with 2, 3 and 4 fruit in addition to 0, 1 and 5 fruit during the Enhanced Surveillance Processing Test Procedures**

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**SUMMARY**

**Response to Action Item 3-14. This paper is a discussion on the need to run cases with 2, 3 and 4 fruit in addition to 0, 1 and 5 fruit during the Enhanced Surveillance Processing Test Procedures. A discussion at the 3<sup>rd</sup> meeting regarding the complexity of the test procedures led to the question of whether testing only with 0, 1, and 5 fruit cases is sufficient for enhanced reception validation. It is the position of this working paper that running with 0, 1 and 5 fruit is not sufficient and that at a minimum 0, 1, 3 and 5 fruit should be tested.**

## **Introduction**

At the third meeting of working group 3, an initial draft of proposed enhanced surveillance processing test procedures was presented. A part of these test procedures include a data block test where ATCRBS fruit is injected into the data block portion of an extended squitter message. There are 6 test steps proposed (0 through 5) that inject from 0 to 5 ATCRBS fruit respectively. At each step, the test is repeated with the ATCRBS fruit at 7 different power levels with respect to the extended squitter message, and at each power level the test is run 1000 (proposed) iterations. The proposed enhanced surveillance processing test procedures are quite complex and depending on the test equipment configuration, could be rather time consuming. It is the goal of test procedure developers to define test procedures that perform the tests necessary to validate system performance without adding steps that are superfluous. To that end, working group 3 is considering only running tests with 0, 1 and 5 fruit and omitting the test cases with 2, 3 and 4 fruit.

## **Discussion**

Testing with 0 fruit is required to establish a baseline system performance (MTL) and to validate the test configuration. Since 5 overlapping fruit is the maximum interference that will be tested, then 1 and 5 fruit are required to measure performance at the end points. It is anticipated that the required performance with 1 fruit will be quite high since the enhanced error correction techniques are designed to work with one overlapping ATCRBS with a very low undetected error rate. Conversely, it is anticipated that the required performance with 5 fruit will be quite low, especially when the relative amplitude offset is 0 dB. If none of the points in between are tested, then the potential exists for a system to pass that performs as poorly with 2 or more fruit as it does with 5. Also, in high fruit environments the probability of a message encountering 2 or 3 interfering ATCRBS is higher than the probability of encountering 5. As for test configuration complexity is concerned, if a test set-up is capable of producing 5 fruit then any less should not be a problem other than extended testing time. For the above reasons, it is recommended that all six test steps be performed. However, if manufacturers are able to demonstrate convincingly that there is no real benefit to running the intermediate steps, then as a minimum, tests with 0, 1, 3 and 5 fruit should be required. All six (0 through 5 fruit) configurations will be tested with the gold standard bench tests and it may be prudent to defer a final decision until after those tests are conducted.