

RTCA Special Committee 209

Working Group #1

Mode S Transponder MOPS Development/Maintenance

Meeting #1

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BAE Systems Response to Action Item 6-3

Transponder Reply Rate Capabilities

Revision 1

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SUMMARY

This Working Paper summarizes the BAE Systems response to SC-209 Action Item 6-3 requesting the testing of the company transponders for reply rate capabilities.

RTCA SC209 Working Paper Mode S-WP01-11R1: Reply rates, BAE Systems R. Bayh

Reply Rates for Transponders:

Our military transponder performance, including reply rates, is specified by the DoD AIMS office. Their governing performance specification for Mode 4 transponders, including Modes 1, 2, 3/A, C, 4 and Mode S is AIMS 97-1000. Their governing specification for Mode 5 transponders (Modes 1, 2, 3/A, C, S, 4 and 5) is AIMS 03-1000A.

AIMS 97-1000 specified a minimum reply rate for Selective Identification Feature (SIF)/ATCRBS (Modes 1, 2, 3/A and C) is 1200 ± 100 replies per second. A single collective reply rate limiter is used for SIF/ATCRBS replies. For Mode S performance, the reply rates in RTCA/DO-181 were specified and when appropriate, TCAS capable transponder reply rates are used (minimum 60 replies per second). A separate Mode S reply rate limiter is used and will support the “burst” rates specified in RTCA/DO-181B.

Mode 5 transponder performance is governed by AIMS 03-1000A. Here, the SIF/ATCRBS reply rates are specified at 1000 ± 100 replies per second continuous and the Mode S rate is 65 ± 5 replies per second. Independent rate limiters are used for SIF/ATCRBS, Mode S, and the military modes. Higher rates can be supported for short periods of time, similar to the Mode S “burst” rates.

The BAE Systems AN/APX-117, AN/APX-118, AN/APX-123 and AN/APX-124 transponders are certified for AIMS compliance and will support a minimum of 1000 SIF/ATCRBS replies simultaneously with 60 Mode S replies.

All military transponders certified by the DoD AIMS Program Office has to meet these requirements.