

RTCA Special Committee 186, Working Group 3

ADS-B 1090 MOPS, Revision A

Meeting #6

ACTION ITEM 5-8

**Note to Explain Why a Non-Transponder Device
is Limited to Class A0**

Presented by Vincent Orlando

SUMMARY

At the fifth meeting, a question was raised as to why DO-260 limited the use of a non-transponder device (NTD) to Class A0.

The answer to the question is that the NTD does not use the spectrum as efficiently or provide the system benefits that can be obtained with a transponder implementation of extended squitter.

This working paper proposes that a note be added to DO-260 to explain this limitation..

1.0 Introduction

At the fifth meeting, a question was raised as to why DO-260 limited the use of a non-transponder device (NTD) to Class A0.

The answer to the question is that the NTD does not use the spectrum as efficiently or provide the system benefits that can be obtained with a transponder implementation of extended squitter.

2.0 Proposed Note for DO-260

Insert the following note at the end of paragraph 2.2.2.2:

Note:

A 1090 MHz non-transponder device (NTD) is intended to provide the lowest cost implementation of extended squitter for low-end GA users. An NTD implementation does not use the 1090 MHz spectrum as efficiently nor provide all of the system benefits as a transponder implementation. For this reason, its use is restricted to class A0 operation in order to limit the number of such devices. Examples of the spectrum efficiency and system benefit issues related to NTDs are as follows:

1. TCAS will not be able to benefit from the ADS-B information from the NTD. TCAS will only monitor ADS-B data reported in DF=17 squitters (as emitted by a Mode S transponder). DF=18 squitters from NTDs are not monitored since TCAS must assume that it cannot interrogate the aircraft (via Mode S) to validate the range and approximate bearing via active interrogations through a process called hybrid surveillance.
2. Mode S interrogators will not be able to benefit from the ADS-B information from the NTD. Mode S interrogators will not be able to read extended squitter messages via direct air-ground readout. Such readout requires that the ADS-B data is available in the transponder registers. This will not be the case for an NTD.
3. More interference is generated. An aircraft equipped with an NTD and a Mode A/C transponder will generate more interference than a Mode S transponder implementation of extended squitter. Examples are as follows: (1) For a transponder implementation, TCAS will (after validation) maintain an aircraft on passive surveillance unless it becomes a near threat or a threat. For the NTD case, the aircraft will emit extended squitters and be regularly interrogated by TCAS. (2) A Mode S transponder implementation of extended squitter offers a surface surveillance system the possibility of controlling the squitter rate to reduce unnecessary transmissions