

RTCA Special Committee 186, Working Group 3

ADS-B 1090 MOPS, Revision A

Meeting #15

**Action Item 13-05
Ground Vehicle Auto Shutoff Requirement**

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SUMMARY

This working paper satisfies action item 13-05, which has been assigned to Jim Maynard and Mark Schneider. The action item calls for the resolution of an “omitted requirement” for automatic shutoff of class B2 transmitters outside the movement area and perhaps a surrounding buffer zone. Two alternatives are submitted for possible resolutions to the action item. The first alternative, consistent with the decision of the UAT MOPS Working Group, is to not add a requirement for automatic shutoff of Class B2 transmitters. This proposal is based on the argument that proper use of licensed equipment is the responsibility of the licensee, not the equipment manufacturer. The second alternative is to add a new requirement to Section 2.2.3.3.2.12 based on the following draft requirement:

- Class B2 Non-Transponder-Based Transmitting Subsystems on ground vehicles **shall** provide an interface capable of putting the unit into a standby condition in which the unit suspends all message transmissions.

The proposed requirement would be accompanied by several explanatory notes, which are described in the body of this working paper.

1 Background

Jim Maynard and Mark Schneider have been tasked in action item 13-05 to prepare an “omitted requirement” working paper for class B2 surface vehicles, which should only transmit in the movement area and perhaps a surrounding buffer zone. Jim and Mark were also tasked to determine which section of DO-260A is most appropriate to accommodate this requirement (§2.1 or §3).

Requirement 3.6 in §3.3.1 of DO-242A states, “If required due to spectrum considerations, ADS-B transmissions from ground vehicles (Class B2) shall be automatically prohibited when those vehicles are outside the surface movement area (i.e., runways and taxiways).

2 Alternatives for Resolution of Action Item 13-05

2.1 No New Requirement

The UAT MOPS was reviewed to determine if a requirement could be adapted from the UAT MOPS to the 1090 MOPS. The UAT MOPS Working Group consciously decided not to address this requirement. In Appendix B of the UAT MOPS, the MASPS Compliance Matrix states that, “It is outside the scope of any ADS-B link MOPS to ensure compliance with the automatic feature of this requirement.” Ed Valovage was interviewed to gain some perspective on why this position was adopted by the UAT Working Group. To the best of Ed’s recollection, the UAT Working Group position was based on two arguments:

1. It is not the business of data link equipment manufacturers to control the behavior of users. For example, a handheld radio that is limited to aviation purposes does not automatically disable itself if the user is neither in an aircraft nor at a licensed ground station. The UAT Working Group felt that these issues were well outside the scope of their work.
2. Attempting to specify any geographic region puts the responsibility on the committee to specify resolution, accuracy, and perhaps other characteristics of the geographic region.

The corresponding arguments (“devil’s advocate”) in favor of requiring automatic shutoff are provided below:

1. Ground vehicle transponders are a unique utilization of controlled spectrum because vehicles will frequently move in and out of the movement area, which means that transmitters will frequently need to toggle between the on state and the off state. Individuals other than highly trained pilots and controllers will operate the vehicles. There is a high probability of accidental transmissions outside the movement area if an “automatic” shutoff is not provided as part of the ADS-B device.
2. The requirement can be specified in a way that leaves the implementation open to the equipment vendor.

2.2 New Requirement

2.2.1 Draft Requirement Language

The following new draft requirement could be added to Section 2.2.3.3.2.12 (**Message Termination**):

c. Class B2 Non-Transponder-Based Transmitting Subsystems on ground vehicles **shall** provide an interface capable of putting the unit into a standby condition in which the unit suspends all message transmissions.

Note 1. This interface is intended to be used by a mapping function that will automatically trigger the interface if the transmitter is outside a user adaptable two-dimensional geographic area.

Note 2: If required due to spectrum considerations, the two-dimensional geographic area will be defined as the movement area (i.e., runways and taxiways) plus a reasonable buffer area (i.e., 50 foot buffer). Implementations of this feature should be designed such that a particular ground authority can specify a region that conserves spectrum without introducing risk of accidental termination within

the movement area. Consideration should be given to precision and accuracy of the geographic region definition.

Note 3: As a vendor option, this mapping function may be implemented integral to the Class B2 equipment. In this case, the interface is internal to the unit.

The language of the draft requirement compels equipment vendors to provide a means for spectrum conservation without placing responsibility on the equipment vendors for proper implementation in the field. The requirement does not define the geographic area in terms of the movement area. This would be impossible to test except on an installation specific basis. Defining the geographic area in terms of the movement area would also impose a requirement on installations that may not be appropriate outside the United States.

2.2.2 Location of Requirement in Document

Section 2.2.3.3.2.12 of DO-260A, called “ADS-B Message Termination,” describes circumstances in which transmitters should terminate message transmission. Because the proposed requirement for automatic shutoff is another example of message termination, section 2.2.3.3.2.12 seems like the most appropriate section.

Other locations within the text of DO-260A were considered as possible locations for the new requirement.

Section 2.1 was considered, but 2.1 lists general requirements. Levying a requirement on a specific ADS-B device class seemed out of place in Section 2.1.

Section 3 was considered also, but all the Section 3 requirements pertain to installed equipment considerations. This feature is integral to the ADS-B device. Therefore, the requirement should be levied in Section 2, Equipment Performance Requirements.

3 Conclusion

Working Group 3 should decide whether to include a requirement for automatic shutoff. The UAT Working Group has shared some arguments for why it may be inappropriate for MOPS committees to compel equipment vendors to control the environment in which their equipment is used. If Working Group 3 decides to include a requirement, the requirement proposed in Section 2.2.1 of this document can be used as a draft for such a requirement.