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Minimum Operational Performance Standards (MOPS) for Aircraft VDL Mode 2 Physical Link and Network Layer

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FOREWORD

This document was originally prepared by RTCA Special Committee 214 (SC-214), and approved by the RTCA Program Management Committee (PMC) on March 21, 2012.

RTCA, Incorporated is a not-for-profit corporation formed to advance the art and science of aviation and aviation electronic systems for the benefit of the public. The organization functions as a Federal advisory committee, and develops consensus-based recommendations on contemporary aviation issues. RTCA's objectives include but are not limited to:

- coalescing aviation system user and provider technical requirements in a manner that helps government and industry meet their mutual objectives and responsibilities;

- analyzing and recommending solutions to the system technical issues that aviation faces as it continues to pursue increased safety, system capacity and efficiency;

- developing consensus on the application of pertinent technology to fulfill user and provider requirements, including development of minimum operational performance standards for electronic systems and equipment that support aviation; and

- assisting in developing the appropriate technical material upon which positions for the International Civil Aviation Organization and the International Telecommunication Union and other appropriate international organizations can be based.

The organization's recommendations are often used as the basis for government and private sector decisions as well as the foundation for many Federal Aviation Administration Technical Standard Orders and several advisory circulars.

Since RTCA is not an official agency of the United States Government, its recommendations may not be regarded as statements of official government policy unless so enunciated by the U.S. government organization or agency having statutory jurisdiction over any matters to which the recommendations relate.

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EXECUTIVE SUMMARY

This document has been structured with guidelines according to the RTCA MOPS Drafting Guide dated September 21, 2001.

The material in this document highlights the minimum procedures for the physical link and network layer of the VDL Mode 2 subnetwork.

The test procedures used in this document have been coordinated with EUROCAE Working Group 92 during the preparation of EUROCAE Document ED92B.

This document includes four appendices. Appendix B should be considered a normative appendix.

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1. PURPOSE AND SCOPE

1.1 Introduction

This document contains the Minimum Operational Performance Standards (MOPS) and test procedures for aircraft Very High Frequency (VHF) Digital Link (VDL) Mode 2 physical, link and network layer protocol components which comprise an avionics transmitter/receiver (transceiver) function intended to be used for air-ground (A/G) data communications. This document is designed so that equipment certified to it will be compatible with the relevant Minimum Aviation System Performance Standards (MASPS) in RTCA DO-224C and with International Civil Aviation Organization (ICAO) Doc 9776, *Manual on VHF Digital Link (VDL) Mode 2*, which is also known as the VDL Mode 2 Technical Manual. Additional information on VDL Mode 2 is contained in ARINC Specification 631 and ARINC Characteristics 750 and 758.

Compliance with this MOPS is one means of assuring that the VDL Mode 2 equipment will function satisfactorily under all conditions normally encountered in air traffic services communications and that data formats will be compatible with the Aeronautical Telecommunication Network (ATN). These standards specify characteristics useful to designers, manufacturers, installers, and users of the VDL Mode 2 A/G communications system equipment. This document is organized with the following order and format:

- Section 1 describes the purpose and scope.
- Section 2 describes the minimum operational performance standards for:

  - general design requirements

  - standard conditions

  - environmental conditions

  - equipment test procedures
- Section 3 describes the installed equipment tests.
- Section 4 describes the operational tests.

Appendix A contains a list of acronyms used in this document.

Appendix B provides a correlation matrix between the test procedures of Section 2.4 and the VDL Mode 2 system level requirements given in RTCA DO-224C, and the equipment architecture classes defined in Section 1.3. This appendix is normative in the sense that it specifically identifies which requirements make up the minimum set for the standard classes of equipment.

Appendix C provides the analysis that establishes the equivalency between the Frame Error Rate and the bit error rate. This appendix provides the basis for the use of either bit error rate or frame error rate in the verification procedures of Section 2.4.

Appendix D defines the minimum functionality of the Data/Management Interface for Class Y and Class Z architectures. This functionality is described at a high level. No protocol details (i.e., bit definition, data rate, physical layer details, etc.) for the Data/Management Interface are given in this document. Such a standardized interface is the AVLC Simple Interface Protocol (ASIP) described in Attachment 10 to ARINC Characteristic 750.