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Minimum Operational Performance Standards for Aircraft VDL Mode 3 Transceiver Operating in the Frequency Range 117.975 - 137.000 MHz

RTCA DO-271C
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Prepared by: SC-172

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FOREWORD

This document was prepared by RTCA Special Committee 172 (SC-172) and approved by the RTCA Program Management Committee on November 8, 2005.

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.

- Assisting in developing the appropriate technical material upon which positions for the International Civil Aviation Organization and the International Telecommunications 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.

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.

The physical layer material of this document is based on the Physical Layer MOPS for Airborne VDL Mode 2 (EUROCAE Working Group 47 document, ED-92, dated March 2000), since the physical layer is largely in common to both VDL Mode 2 and VDL Mode 3. Development of this document and ED-92 were coordinated with EUROCAE Working Group 47.

Appendix B is a Normative Appendix.

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1 PURPOSE AND SCOPE

1.1 Introduction

This document contains the minimum operational performance standards (MOPS) and verification procedures for an aircraft Very High Frequency (VHF) Digital Link (VDL) Mode 3 transceiver, intended to be used for air-ground (A/G) voice and data communications. The document is designed so that equipment certified to its standards will be compatible with the VDL Mode 3 Minimum Aviation System Performance Standards (MASPS) in RTCA DO-224B.

Compliance with these standards is one means of assuring that VDL Mode 3 equipment will function satisfactorily under all conditions normally encountered in air traffic control (ATC) A/G operations and that data formats will be compatible with the Aeronautical Telecommunications Network (ATN). These standards specify characteristics useful to designers, manufacturers, installers, and users of the VDL Mode 3 A/G communications system equipment.

This document is organized in four major technical sections and appendices as follows:

Section 1 describes the purpose and scope.

Section 2 contains minimum performance requirements under both standard and environmental test conditions with equipment performance verification procedures.

Section 3 describes installed equipment performance tests.

Section 4 describes operational performance tests.

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

Appendix B contains matrices that cross reference requirements to verification testing and equipment architecture classes under environmental conditions and for standard conditions. 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 defines the assumed functional partitioning of VDL Mode 3 protocol functions for the separated equipment architecture.

Appendix D provides an example of the Data/Management Interface for the separated equipment architecture. This example is described at a high level. No protocol details (e.g., bit definition, data rate, physical layer details, etc.) for the Data/Management Interface are given.

Appendix E defines test vectors for evaluation of the vocoder audio levels and a silence test vector for BER testing.

1.2 System Overview

The VDL Mode 3 A/G communications system provides functionally simultaneous voice and data communications between aircraft and ground-based users. The VDL Mode 3 A/G communications system architecture is defined to provide coverage similar to