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MINIMUM OPERATIONAL PERFORMANCE STANDARDS FOR AERONAUTICAL MOBILE HIGH FREQUENCY DATA LINK (HFDL)

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Prepared by SC-188

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FOREWORD

This report was prepared by Special Committee 188 (SC-188) and approved by the RTCA Program Management Committee (PMC) on December 14, 2000.

RTCA, Incorporated is 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:

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- 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 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.

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1 PURPOSE AND SCOPE

1.1 Introduction

These standards specify system characteristics that should be useful to designers, manufacturers, installers and users of the HF Data Link systems and equipment.

Compliance with these standards is recommended as one means of assuring that the HF Data Link avionics will perform its intended function(s) satisfactorily under all conditions normally encountered in routine aeronautical operations. Any regulatory application of this document is the sole responsibility of appropriate governmental agencies.

This document encompasses standards and descriptions of a system configuration including Ground Subnetworks; HF Data Link Subnetworks, of which the Aircraft is one part; and Aircraft Subnetworks. However, the specified Minimum Operational Performance Standards in this document address only the aircraft HF Data Link Subnetwork function.

The MOPS covers typical HF Data Link avionics requirements and tests for the aircraft avionics. It includes the purpose, scope and equipment performance requirements; recommended bench tests and other performance verification procedures; and installed-equipment tests and operational performance characteristics. The High Frequency Data Link (HFDL) functions operate in the aeronautical frequency bands 2-30 MHz. The transceiver must be capable of being tuned in integral multiples of 1 kHz to support the HF Data Link function and use the class of emission 2K80J2DEN.

Section 1.0 of this document provides general information needed to understand the rationale for HF Data Link equipment and system characteristics and requirements stated in the remaining sections. It describes typical applications and operational goals as envisioned by the members of Special Committee 188 and establishes the basis for the standards stated in Sections 2.0 through 3.0. Definitions and assumptions essential to proper understanding of this document are also provided in this section, while a more extensive glossary appears as Appendix A.

Section 2.0 contains the minimum performance standards for the aircraft HF Data Link function. These standards specify the required performance under standard and environmental conditions. Also included are recommended bench test procedures necessary to demonstrate equipment and network compliance with the stated minimum requirements.

Section 3.0 describes the performance required of the installed aircraft avionics equipment. Tests specifically for the installed equipment are included when performance cannot be adequately determined through bench testing.

Section 4.0 describes the operational performance characteristics for equipment installations and for network operation and defines conditions that will assure the equipment user that operations can be conducted safely and reliably in the expected

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The following list summarizes the industry standard documents and their specific versions referenced within this MOPS:

Reference Document Name	Version
RTCA DO-160D	July 27, 1997
RTCA DO-163	March 19, 1976
RTCA DO-178B	December 1, 1992
RTCA DO-210D	April 19, 2000
RTCA DO-215A	February 21, 1995
RTCA DO-238	April 2, 1997
ARINC Characteristic 753-2	February 20, 1998
ISO-8208 (English)	Release 2*
HFDL SARPs	Annex 10, Chapter 3, Amendment 74
ICAO Manual for High Frequency Data Link First Edition 2000, Doc 9741-AN/962**	May 2000
ITU Appendix 27 AER 2	
AC 20-140	August 16, 1999

Note: ** Includes Amendment 1. ** Within this document the abbreviation "ICAO SARPs Technical Specifications" will be used.*

In the event of any conflict between documents, this MOPS shall take precedence.

Document references within this MOPS are used to assure common requirements between various documents to minimize the risk of conflict, and to reduce the complexity of this document. The user of this MOPS should keep in mind that the referenced documents may, or may not, contain actual references to HF Data Link and therefore some editorial translations may be necessary.

As used in this document, the term "aircraft avionics" includes all components and units necessary for the aircraft system to communicate through a High Frequency Ground Station for data services. The aircraft avionics comprises multiple components, including antennas, couplers, and modulators/demodulators (MODEMs). A particular aircraft avionics will not necessarily include all components or units referred to herein but will perform all required functions.

The guidelines contained in RTCA/DO-178B, *Software Considerations in Airborne Systems and Equipment Certification*, should be considered with respect to aircraft HF Data Link software packages. Users should also consult FAA Advisory Circular AC 20-140, *Guidelines for Design Approval Aircraft Data Communications Systems*, dated 8/16/99.

1.2 System Overview

The High Frequency Data Link provides worldwide communications directly between

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