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Aeronautical Mobile Airport Communications System (AeroMACS) Profile

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FOREWORD

This report was prepared by RTCA Special Committee 223 (SC-223) and approved by the RTCA Program Management Committee (PMC) on December 18, 2013.

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 Aeronautical Mobile Airport Communications System (AeroMACS) Profile document specifies the unique adaptations required to enable the current IEEE 802.16-2009 standard to specify technical requirements for wireless data communications to mobile stations on an airport surface. It was developed under collaboration between the RTCA Special Committee 223 (SC-223) and the European Organization for Civil Aviation Equipment EUROCAE Working Group-82.

The purpose and scope section concentrates on introducing the technology and describes the process for the AeroMACS profile development. It defines the bounds of the investigation, the required cooperation between RTCA, EUROCAE, and the WiMAX forum.and provides a clear scope prescribing guidelines for profile development. In this section various glossary terms used in the document are described.

The background section provides an overview of system characteristics including concept of operations and principal users of AeroMACS. A description of operational mobile and stationary applications illustrates the different requirements this technology is required to meet. A description of assumptions is provided along with verification procedures necessary to validate profile parameter selection.

The technical profiles section describes technical parameter selection required to meet aviation communication requirements. Parameters are selected to meet mobile station requirements and considers operational uses for different environments along with different potential users. This profile requirements section concentrates on different spectrum areas focusing on efficient use of channel assignments and interoperability requirements prescribed by WiMAX forum.

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1 PURPOSE AND SCOPE

1.1 Introduction

This document specifies requirements for the unique adaptations to the current IEEE 802.16-2009 standard to provide wireless data communications to mobile platforms on an airport surface.

AeroMACS is based on the existing IEEE 802.16-2009 WiMAX standard. Within the WiMAX Forum ™, an Aviation Working Group (AWG) has been incorporated to adapt AeroMACS requirements into the WiMAX profile documents. This ensures that all stakeholders comprising test equipment vendors, integrated circuit manufacturers, as well as the aviation industry are capable of supporting the AeroMACS development.

As system profiles gradually include more features -- resulting in increased performance -- more complex parts of the standard may be chosen by the aviation community to be incorporated into new and more-advanced AeroMACS profiles. If so, some of the parameters provided in this document may have to be updated."

This document has investigated the use of WiMAX Forum™ Mobile System Profile: Release 1.0 Version 0.9 (WMF-T23-001-R010v09) against avionics needs. No technical obstacles - which would make it impossible to operate this particular profile for aviation – were found.

Further analysis of the AeroMACS features was performed in the context of the SESAR project P15.2.7 activities and the outcome of these activities has been injected in the finalization of the AeroMACS profile and related documents in RTCA and EUROCAE (e.g., the AeroMACS MOPS).

The joint RTCA and EUROCAE AeroMACS profile described in this document is based on the WIMAX document WiMAX Release 1 System Profile (WMF-T23-001Release 010 v09).

1.2 AeroMACS Design Reference

All AeroMACS subscriber units shall be designed to the WiMAX profile document Release 1.0 WiMAX Forum.

[1] Mobile WiMAX Release 1 System Profile (WMF-T23-001-R010v09)
http://members.wimaxforum.org/apps/org/workgroup/twg/document.php?document_id=53651

[2] Mobile WiMAX Standard Reference Document
(DRAFT-T23-004-R010v02-C_SRD)

[3] Mobile WiMAX Trait Package Documents (DRAFT-T24-002-R010v01-H_TPA)

[4] IEEE 802.16-2009

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