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Minimum Aviation System Performance Standards (MASPS) for Flight Information Services-Broadcast (FIS-B) Data Link

Revision A

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FOREWORD

The original report (DO-267) was prepared by Special Committee 195 (SC-195) and approved by the RTCA Program Management Committee (PMC) on March 27, 2001. Revision A of DO-267 was prepared by SC-195 and approved by the PMC on April 29, 2004. Appendices D, F and I are normative appendices.

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:

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

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

c. 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

d. 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 a 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 have statutory jurisdiction over any matters to which the recommendations relate.

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EXECUTIVE SUMMARY

This document contains Minimum Aviation System Performance Standards (MASPS) for Flight Information Services-Broadcast (FIS-B), an automated, digital data link system. The FIS-B system will provide timely access to data link updates of non-control, advisory information needed by pilots to operate safely and efficiently in the National Airspace System and in international airspace.

The format of this document generally follows that of an RTCA Minimum Operational Performance Specification (MOPS). However, a traditional MOPS is not appropriate for FIS-B since this document establishes system performance rather than requirements for specific equipment. This MASPS supports interoperability between providers of ground and airborne FIS processing systems by defining a broadcast protocol that may be used in any broadcast medium (i.e., VHF, satellite). The MASPS also provides design guidelines and recommended standards for airborne processing and display of FIS products.

The FIS-B broadcast network organization described in the MASPS consists of a physical layer, an International Standards Organization (ISO) standard-based Data Link Services (DLS) layer, a Network layer, an FIS-B Application Service Element (ASE), and an FIS-B Application. The physical layer is supplied by the manufacture with all the other layers and/or elements defined in the MASPS.

The FIS-B Application Service Element (ASE), noted above, provides connectionless unacknowledged protocol services to include support for the segmentation (and reassembly) of large data files into Application Protocol Data Units (APDUs). Segmenting large application data files into smaller APDUs reduces the amount of data lost due to any data link impairments. The MASPS also establishes a publicly accessible FIS-B Product Registry that facilitates coordination and publication of specifications for APDU Payload encoding of new FIS products.

The MASPS guidance for airborne processing and display of FIS products is applicable to any display of FIS information in the flight deck (or cockpit). It is anticipated that most avionics that process and display FIS products will be approved using existing type certification or supplemental type certification processes such as TSO C113, Airborne Multipurpose Electronic Displays. Consequently, this document only contains guidance that is unique to FIS-B and independent of other functions that are governed by other directives such as terrain and obstacles, and traffic.

As the National Airspace System (NAS) evolves and the concepts of Free Flight are implemented, the requirement for use of FIS products and services may change from being advisory in nature to being required for safety of flight. Any such required use will require a revised definition of the operating environment outlined in this MASPS to include the associated application of Required Communications Performance (RCP) criteria. The introduction of such RCP criteria will require changes to this MASPS, especially to Section 2.0, System Performance Specifications, and Section 4.0, Procedures for Performance Requirement Verification.

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1 PURPOSE AND SCOPE

1.1 Introduction

This document contains Minimum Aviation System Performance Standards (MASPS) for Flight Information Services-Broadcast (FIS-B), an automated, digital data link system. The FIS-B system will provide timely access to data link updates of non-control, advisory information needed by pilots to operate safely and efficiently in the National Airspace System and in international airspace. FIS-B services will provide FIS information to pilots such as weather graphics and text, Special Use Airspace (SUA) information, and Notices to Airmen (NOTAMs). This document provides a broadcast protocol for use in any broadcast medium.

These specific system performance standards and equipment characteristics should be useful to designers, manufacturers, installers, and users of FIS-B data link systems. Functional specifications are used where possible so that implementers may have flexibility in developing FIS-B data link systems. Designing to these standards is one means of assuring that the system and equipment will perform their intended functions satisfactorily under all conditions normally encountered in routine aeronautical operations. Any regulatory application of this document is the sole responsibility of appropriate governmental agencies.

The format of this document generally follows that of an RTCA Minimum Operational Performance Specification (MOPS). However, a traditional MOPS is not appropriate for FIS-B, since this document establishes system performance rather than requirements for specific equipment. This MASPS defines a broadcast protocol that supports interoperability between providers of ground and airborne FIS processing systems and provides design guidelines and recommended standards for airborne processing and display of FIS products.

Section 1 of this document provides information on purpose and scope needed to understand the rationale for system and equipment characteristics, standards, and performance requirements stated in the remaining sections. It describes typical system applications and operational goals, and establishes the basis for the standards and performance requirements stated in Sections 1 and3, and Appendices D and F.

Section 2 contains the minimum system performance standards for FIS-B data link systems.

Section 3 contains the minimum performance standards for each subsystem/function that is a required element of the minimum system performance in Section 1. Section 3.1 defines the FIS-B network interface and Section 3.8 provides guidelines and recommended standards for airborne processing and display of FIS products.

Section 4 describes a set of minimum system test procedures to verify system performance compliance (e.g., end-to-end performance verification) and that subsystem performance meets the minimum performance requirements in Sections 1 and 3, and normative Appendices D, F and I.

Appendix A contains a list of acronyms and abbreviations.

Appendix B contains a glossary of terms.

Appendix C contains a list of references.