Radio Technical Commission for Aeronautics
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REPORT OF SPECIAL COMMITTEE 159 ON

MINIMUM AVIATION SYSTEM PERFORMANCE STANDARDS (MASPS)

FOR GLOBAL POSITIONING SYSTEM (GPS)

RTCA/DO-202
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F O R E W O R D

This document was prepared by Special Committee 159 of the Radio Technical Commission for Aeronautics. It was approved by RTCA on November 28, 1988.

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Coordination of these standards was accomplished by RTCA Special Committee 159 with the European Organisation for Civil Aviation Electronics (EUROCAE) Working Group 28.

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1.0 PURPOSE AND SCOPE

The purpose of this document is to define the Global Positioning System (GPS) and related evolving parameters for operation and use by civil airspace users. It is intended that the definition will be sufficient to provide a basis for future preparation of civil minimum operational performance standards (MOPS).

The uses of GPS as a supplemental and as a sole-means system for en route, terminal area and non-precision approach operations in civil airspace are considered. Civil GPS avionics must enable air operations in the existing civil national airspace system.

Considerations for enhancements to the initial military GPS program and its planned constellation of 21 operational satellites with three active spares, along with considerations for civil avionic equipment standards, are described.

Appendices B and C are working group reports prepared prior to finalization of these minimum aviation system performance standards (MASPS) and are provided as reference material. Material in the main body of this MASPS takes precedance where conflicts exist between the main body and Appendices B or C.

1.1 Introduction

The RTCA Executive Committee established Special Committee 159 (SC-159) on September 20, 1985, to produce civil minimum aviation system performance standards (MASPS) for the operation and use of the evolving U. S. Global Positioning System. Based on the terms of reference (Appendix A) and the work of SC-159, including its Integrity Working Group (Appendix B), GPS Integrity Channel Working Group (Appendix C) and cooperation from DoD, this MASPS has matured.

In the finalization of this document, several comments were submitted that were considered more appropriate to the development of minimum operational performance standards. These comments are provided in Appendix F for future reference.

1.2 System Architecture

GPS is a Department of Defense (DoD) operated global coverage, satellite-based navigation system. It provides standard positioning service (SPS) to all equipped users plus precision position service (PPS) to DoD specially equipped users, and other specially equipped users. This MASPS addresses the use of GPS in the civil airspace.

Signal characteristics of the initial GPS are contained in ICD-GPS-200, a United States Air Force document. This MASPS uses the latest version of this document and other information provided by the DoD GPS Program Office.

1.2.1 GPS Configuration

The DoD GPS consists of three segments: Space Segment, Control Segment and User Segment.

1.2.1.1 Space Segment

The planned space segment will consist of 21 satellites, plus three active spares (GPS Block II) that are deployed in six orbital planes. The space segment provides the signal structure