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MINIMUM OPERATIONAL PERFORMANCE STANDARDS FOR AIR TRAFFIC CONTROL RADAR BEACON SYSTEM/MODE SELECT (ATCRBS/MODE S) AIRBORNE EQUIPMENT

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FOREWORD

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 Standards Development Organization (SDO) 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 (ICAO), the International Telecommunication Union (ITU) 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.

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1 PURPOSE AND SCOPE

1.1 Introduction

This document sets forth minimum operational performance standards for Mode Select (Mode S)[1] airborne equipment. Incorporated within these standards are system characteristics that will be useful to users of the system as well as designers, manufacturers and installers.

Compliance with these standards is recommended as a means of assuring that the equipment will perform its intended function(s) satisfactorily under all conditions normally encountered in routine operations.

It is recognized that any regulatory application of these standards is the responsibility of appropriate government agencies.

Because the measured values of equipment performance characteristics may be a function of the measurement method, standard test conditions and methods of test are included in this document.

This document considers an equipment configuration consisting of: transponder, control panel, antenna and interconnecting cables. It should not be inferred that all Mode S airborne equipment will necessarily include all of the foregoing components as separate units; this will depend on the design configuration chosen by the manufacturer. Additional functions and components that may refer to expanded equipment capabilities are identified as additional capabilities. Equipment features that are beyond the scope of this document may be developed in future RTCA activities.

If the equipment implementation includes a computer software package, the guidelines contained in the most current issue of RTCA DO-178, *Software Considerations in Airborne Systems and Equipment Certification*, should be considered. If the equipment implementation includes design considerations for use in conjunction with TCAS functionality, the guidelines contained in the most current issue of RTCA DO-185, *Minimum Operational Performance Standards for Traffic Alert and Collision Avoidance System (TCAS) Airborne Equipment*, should be considered. If the equipment implementation includes design considerations for use in conjunction with ACAS Xa functionality, the guidelines contained in the most current issue of RTCA DO-385, *Minimum Operational Performance Standards for Airborne Collision Avoidance System X (ACAS X) (ACAS Xa and ACAS Xo)*, should be considered. If the equipment implementation includes design considerations for use in conjunction with ACAS-Xu functionality, the guidelines contained in the most current issue of RTCA DO-386, *Minimum Operational Performance Standards for Airborne Collision Avoidance System Xu (ACAS Xu)*, should be considered.

Throughout this document, the term CAS is used to mean a generic collision avoidance system, applicable to any of the existing airborne collision avoidance implementations. The specific terms TCAS, ACAS Xa (or RTCA DO-385) and ACAS Xu (or RTCA DO-386) are used when the associated text applies only to a particular implementation. The full descriptor ACAS Xa/Xo is shortened to ACAS Xa, and TCAS II is shortened to

[1] For the purpose of this document, the term "Mode S" implies a combined ATCRBS/Mode S capability.

