RTCA, Inc.
1150 18th Street, NW, Suite 910
Washington, DC 20036, USA

Detect and Avoid (DAA)
White Paper

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Prepared by: SC-228

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FOREWORD

This report was prepared by RTCA Special Committee 228 (SC-228) and approved by the RTCA Program Management Committee (PMC) on (date)

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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1. INTRODUCTION

This document contains the Plan and Description for development of Phase I Minimum Operational Performance Standards (MOPS) for Unmanned Aircraft System (UAS) Detect and Avoid (DAA) system. The standards will specify performance standards that should be useful to designers, manufacturers, installers and users of the equipment. Emphasis for this initial phase will be standards development on civil UAS equipped to operate into Class A or restricted airspace under IFR, and will not apply to sUAS operating under a different standard, if and when such standards becomes available.

Compliance with the to be-developed standards is recommended as one means of assuring that the equipment will perform its intended function(s) satisfactorily under all conditions normally encountered in routine aeronautical operation as described in the RTCA SC-228 Terms of Reference (TOR) and this document for DAA Phase I. Any regulatory application of this document is the sole responsibility of appropriate governmental agencies.

Sections of this document provide information needed to understand the rationale for development of equipment characteristics and work to be performed in the remaining sections. It describes typical operations and operational goals, as envisioned by the members of Special Committee SC-228, and establishes the basis for the standards that will be developed. Definitions and assumptions essential to proper understanding of this document are also provided.

The standards to be developed will specify the required DAA performance under standard environmental and operational conditions that will be defined as described in the Work Plan section later in this document. Also included in the MOPS will be recommended test procedures necessary to demonstrate equipment compliance with the minimum requirements.

The MOPS will describe the performance required of the DAA system hardware, software, firmware, processors, DAA displays & controls, and data links collectively referred to as DAA equipment in the remainder of this document. To the maximum extent possible, required data link performance will be included by reference to the Phase 1 C2 MOPS concurrently under development by the SC-228 C2 Working Group. Tests for the DAA installed equipment are to be included in the MOPS where performance cannot be adequately determined through bench testing.

The MOPS will describe the operational performance characteristics for DAA equipment installations and will define conditions that will assure the equipment user that operations can be conducted safely and reliably in the expected operational environment.

The MOPS will consider a DAA equipment configuration consisting of: sensors, processors, software/firmware, communication data links, and displays and controls that will allow the Pilot in Command (PIC) of an UAS to conduct safe and efficient transit operations through Class D, E and G airspace while not in the traffic pattern. Operational performance standards for functions or components that refer to equipment capabilities that exceed the stated minimum requirements will be identified as optional features. Performance requirements and associated test procedures may be developed for these optional features. Schedule and other resource constraints will limit the identification and specification of optional features.

The word “equipment” as used in this document includes all components and units necessary for the system to properly perform its intended function(s). For example, the “equipment” may