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**Guidance Material
and
Considerations
for
Unmanned Aircraft Systems**

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Foreword

This report was prepared by Special Committee 203 (SC-203) and approved by the RTCA Program Management Committee (PMC) on March 22, 2007.

RTCA, Inc. 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:

1. coalescing aviation system user and provider technical requirements in a manner that helps government and industry meet their mutual objectives and responsibilities;
2. analyzing and recommending solutions to the system technical issues that aviation faces as it continues to pursue increased safety, system capacity and efficiency;
3. 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
4. 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.

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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Table of Contents

1	Introduction	1
1.1	Unmanned Aircraft System Description	3
1.2	National Airspace System Description	10
1.3	Definition of Terms and Acronyms	10
1.4	Assumptions	11
1.5	General Safety Considerations	12
2	UAS Operations.....	14
2.1	Introduction.....	14
2.2	UAS Operational Characterization	17
2.3	Operational Categorizations.....	19
2.4	Specific Operational Guidance and Considerations.....	29
3	UAS Standards Assessment.....	49
3.1	High-level Operational Functions Decomposition Analyses	49
3.2	Regulations and Standards Gaps Analysis	50
3.3	Recommended Future Regulations and Standards Work.....	60
	Membership	65
	Appendix A – UAS Hierarchy of Terms	A-1
	Appendix B – Terminology and Acronyms	B-1
	Appendix C – NAS Details.....	C-1
	Appendix D – Operational Functions	D-1
	Appendix E – (Reserved).....	E-1
	Appendix F – Representative UAS Mission Scenarios.....	F-1
	Appendix G – Functional Allocation, Operations to Systems	G-1
	Appendix H – Regulatory and Standards Gaps Analysis.....	H-1
	Appendix I – Best Practices for Small Unmanned Aircraft Systems.....	I-1
	Appendix I-1: Sample SUAS Operational Concepts.....	I-23
	Appendix I-2: Sample of Completed SUAS Operational Concept Worksheet	I-31
	Appendix I-3: (Reserved)	I-41

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Table of Figures

<u>Figure 1</u> : Relationship between UAS Guidance Material and Other SC-203 Documents.....	2
<u>Figure 2</u> : UAS Notional Architecture	5
<u>Figure 3</u> : UAS Aircraft Segment Notional Diagram.....	6
<u>Figure 4</u> : UAS Control Segment Notional Diagram.....	8
<u>Figure 5</u> : NAS Airspace Classifications	10
<u>Figure 6</u> : Layered Structure of Separation and Collision Avoidance	32
<u>Figure 7</u> : Functional Taxonomy Used to Provide an Architectural Framework for the Gaps Analysis	49

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1 INTRODUCTION

Aviation is entering a new frontier with the introduction of Unmanned Aircraft Systems (UAS) into the National Airspace System (NAS). Present UAS operations are conducted in segregated airspace and in limited combat theaters. This will change as commercial and national security interests will drive the use of UAS into all classes of the NAS. This transition will present unique challenges and opportunities to the aviation community.

This guidance material is intended to educate the community and be used to facilitate future discussions on UAS standards. This document is not intended to be the basis for airworthiness certification and operational approval of UAS, a responsibility that lies with the Federal Aviation Administration (FAA). The UAS manufacturers and operators will be responsible for meeting the airworthiness certification and operational approvals appropriate to the desired use of the UAS.

UAS operations must meet safety requirements that govern operations in the NAS. UAS must operate safely, efficiently, and compatibly with manned aircraft operation in the airspace so that the overall safety of the airspace is not degraded. The fundamental safety requirement for the UAS is to provide an acceptable level of risk for people and property in the air and on the ground. Before the aviation community develops standards, it must understand UAS as a whole and their intended operations within the NAS. This guidance material provides the aviation community a definition of UAS, a description of the operational environment, and a top-level functional break down. The guidance material provides a framework for developing standards through RTCA Special Committee (SC) – 203. This document reflects the key ideas which should go into development of the Minimum Aviation System Performance Standards (MASPS), but it is not intended to limit or restrict future thinking.

This guidance contains an overview of UAS operations that should be useful to designers, manufacturers, installers, service providers, and users of UAS intended for operational use in the NAS. The specific technical implementation or design architecture to meet the defined operational and technical characteristics is left to the system designer. This document addresses all UAS and UAS operations being considered for realistic implementation in the NAS in the foreseeable future. Included are military, civil, scientific, private, and commercial operations. Not considered are unmanned systems that are tethered, such as moored balloons and kites; systems that cannot be recovered and flown again, such as weapons, missiles, free balloons, or model rockets; or model aircraft used by hobbyists for recreation only. The broad scoping of this document was intended to help in understanding the breadth of operational concepts and systems being considered for integration into the NAS. The operational and systems descriptions explored in this document are intended to assist in defining boundaries and should not be interpreted as an endorsement of any specific system or practice. [Figure 1](#) shows the relationships among this guidance material, the UAS MASPS, other SC-203 documents, and any related MASPS and Minimum Operational Performance Standards (MOPS) that fall outside the SC-203 Terms of Reference (TOR).