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Minimum Aviation System Performance Standards for C2 Link Systems Supporting Operations of Unmanned Aircraft Systems in U.S. Airspace

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FOREWORD

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- 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 (MOPS) for equipment and electronic systems that support aviation; and

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1.1 INTRODUCTION AND PURPOSE OF DOCUMENT

1.1.1 INTRODUCTION

This document presents and justifies the Minimum Aviation System Performance Standards (MASPS) for a Command and Control Link System (C2 Link System) used to monitor and control an Unmanned Aircraft System (UAS). The C2 Link System carries the information exchanges between a Control Station (CS) and an Unmanned Aircraft (UA). This MASPS is not the only way to determine such standards but is one that was determined to be viable by the members of Special Committee SC-228.

1.1.2 PURPOSE

This MASPS specifies the C2 Link System standards that should be useful to designers, manufacturers, installers, service providers, and users of UAS to support approval of C2 Link Systems intended for operational use within the United States (U.S.) Airspace. The C2 Link may make use of dedicated (point-to-point) links set up by the UAS operator, or it may make use of the services provided by a C2 Link Communication Service Provider (C2CSP), e.g., Mobile Network Operators such as Inmarsat, Iridium, terrestrial 4G or 5G mobile network operators, or any entity that builds a terrestrial network for use as a C2 Link System (See Appendix A.2.9). It is up to the UAS operator and the UAS designer which types of links to select to ensure that C2 Link Service is appropriate for the intended scenarios and airspace. Each of the links selected by the UAS operator and/or UAS designer are represented by Links in Figure 1-1. The MASPS does not assume any specific design for the UA or the CS because of the wide variation found in current UAS designs. Consequently, this document is intended to provide information to support the determination of the specific performance requirements that will be applied to a UAS during the certification process.

The MASPS also explains the process the Special Committee used to create these standards, which enables each UAS certification applicant or C2 Link Service Provider to tailor that process to support approval of their specific design. Because there are a variety of possible UAS designs and possible C2 Link Systems that can be used in those designs, this MASPS establishes requirements based on the airspace where the UAS is operating and type of the messages flowing across the C2 Link Systems. The purpose of the MASPS is to define C2 Link System standards that will be applicable to all UA operating within the scope of the Concepts of Operations (CONOPS) defined in APPENDIX A. This is a different approach from other MASPS that started with requirements from the air navigation service provider and specific CONOPS for the use of communication systems (e.g., Controller Pilot Data Link Communications).

Compliance with these standards is recommended as one means of assuring that a C2 Link System and each of its subsystems will perform its intended function(s) satisfactorily under all conditions normally encountered in routine aeronautical operations for the environments intended. Additionally, the MASPS may be accepted as a means of compliance to regulations by one or more regulatory and/or advisory documents (e.g., advisory circulars, notices, etc.) and may be referenced in part or in total. Any regulatory application of this document is the sole responsibility of the appropriate certification authority

