

RTCA Special Committee 186 Working Group 6

ADS-B / ASA MASPS Maintenance

Meeting #17

Boeing, 1200 Wilson Blvd., Rosslyn/Arlington Virginia

9:00am – 5:00pm EDT

14 – 16 September 2010

Proposal to Combine the Contents of DO-242B and DO-289

Revision 1

Gary Furr, Engility Corporation and Tom Pagano, FAA

SUMMARY

This Working Paper reviews the Table of Contents of both DO-242B and DO-289 for the purpose of proposing a likely Table of Contents and organization of a document resulting in the combination of the two MASPS.

1. INTRODUCTION

The RTCA SC-186 Plenary has directed the newly reconvened Working Group 6 to review the ADS-B MASPS (working draft of DO-242B) and the ASA MASPS (DO-289, including Change 1) for the purpose of combining the two MASPS documents.

During discussions in the two Teleconference Meetings that Working Group 5 has held since reconvening, it has been suggested that the two MASPS documents be combined into a newly minted RTCA publication which represented a combining and reorganizing of the materials in both MASPS documents.

This Working Paper serves to review the Tables of Contents of the two MASPS documents and to make a recommendation as to the Table of Contents of the future product of the WG-6 effort.

2. CURRENT TABLES OF CONTENTS

Sections numbers of DO-242B	Title of DO-242B Sections	Sections numbers of DO-289	Title of DO-289 Sections
1	Purpose and Scope	1	Purpose and Scope
1.1	Introduction	1.1	Introduction
1.2	System Overview	1.2	System Overview
1.3	Operational Applications	1.3	Key Definitions
1.4	Verification Procedures	1.4	Aircraft Surveillance Applications
		1.5	Key Concepts of Operation
		1.6	Application Analysis Methodology
2	Operational Requirements	2	ASA System Requirements
2.1	General Requirements	2.1	ASA Applications
2.2	System Performance – Standard Operational Conditions	2.2	Transmit Quality Level and Application Capability Level
		2.3	ASA System Architecture
		2.4	Requirements
3	ADS-B System Definition and Functional Requirements	3	Interface and Subsystem Requirements
3.1	System Scope and Definition of Terms	3.1	ASA Transmit Subsystems
3.2	ADS-B System Description	3.2	Surveillance Data Link System Requirements
3.3	System Requirements	3.3	ASA Receiving Participant Subsystems
3.4	ADS-B Messages and Reports	3.4	External Subsystems
3.5	ADS-B Subsystem Requirements		
3.6	ADS-B Functional Level Requirements		
4	Procedures for Requirement Verification		
Appendix A	Acronyms	Appendix AA	Acronyms and Definitions of Terms
		Appendix AB	Bibliography
		Appendix AC	Accuracy and Integrity Parameters
		Appendix AD	Requirements for GPS-Derived Position Data for Support of ATC “Radar-Like” Services
		Appendix AE	Compatibility of ASA MASPS with ADS-B Standards and Fielded Systems
Appendix B	Definitions of Terms	Appendix B	Description of the Application Appendices
Appendix C	Bibliography and References	Appendix C	Enhanced Visual Acquisition (EVACQ)
Appendix D	Near-Term ADS-B Applications	Appendix D	Conflict Detection (CD)
Appendix E	Other Applications	Appendix E	Airport Surface Situational Awareness (ASSA)
Appendix F	Efficient Spectrum Utilization	Appendix F	Final Approach and Runway Occupancy Awareness (FAROA)
Appendix G	Design Tradeoff Considerations	Appendix G	Enhanced Visual Approach (EVAPP)
Appendix H	Receive Antenna Coverage Constraints	Appendix H	Airborne Conflict Management (ACM)
Appendix I	Integrity Considerations for ADS-B Applications	Appendix I	Approach Spacing for Instrument Approaches (ASIA)
Appendix J	Accuracy and Update Period Analysis	Appendix J	Independent Closely-Spaced Parallel Approaches (ICAPA)
Appendix K	Latency and Report Time Error Data		
Appendix L	Track Acquisition and Maintenance Requirements		

Sections numbers of DO-242B	Title of DO-242B Sections	Sections numbers of DO-289	Title of DO-289 Sections
Appendix M	Examples of On-Condition Report Formats		
Appendix N	Intent Guidance Material for Future ADS-B Intent Broadcast		
Appendix O	Determination of Intent Information Exchange Requirements for Air-Air Encounter Alerting and De-confliction		
Appendix P	4-bit Coding for Make and Model in ADS-B		
Appendix Q	Future Air-Referenced Velocity (ARV) Broadcast Conditions		
Appendix R	Determining the Navigation Accuracy Category for Velocity (NAC _v)		

3.0 Initial Proposed Outline of Combined Document

<u>Sections numbers of DO-3xx</u>	<u>Title of DO-3xx Sections</u>	<u>Author</u>	<u>Comments</u>
1	Purpose and Scope	Larry Kenney	Review Section 1 of both DO-242A and DO-289 and make recommendations on final content.
1.1	Introduction		
1.2	System Overview		
1.3	Operational Applications		
1.4	Verification Procedures		
2	Operational Requirements	Dean Miller	Review Section 2 of both DO-242A and DO-289 and make recommendations on final content.
2.1	General Requirements		Probably all of section §2.1.2 can be moved into the ADS-B section below into §3.2.1.3. §2.1.2.19 may specifically be moved into Appendix “I” and revised
2.2	System Performance – Standard Operational Conditions		Parts of DO-289 section 2.4 will be moved into §2.2. Need to review the need for the Operational descriptions in the new document.
3	System Definition and Functional Requirements		
3.1	System Scope and Definition of Terms		
3.2	System Descriptions		Need to include a section for Surface Vehicles.
3.2.1	Aircraft Systems (ACL description)		
3.2.1.1	CDTI		
3.2.1.2	ASSAP		
3.2.1.3	ADS-B Subsystem (Transmit and Receive)	Larry Bachman	Review Sections of both DO-242A and DO-289 and make recommendations on final content.
3.2.1.3.1	ADS-B		

<u>Sections numbers of DO-3xx</u>	<u>Title of DO-3xx Sections</u>	<u>Author</u>	<u>Comments</u>
3.2.1.3.1.1	ADS-B Receive and Process		
3.2.1.3.1.2	ADS-B Transmit		
3.2.1.3.2	ADS-R Receive and Process		
3.2.1.3.3	TIS-B Receive and Process		
3.2.2	ANSP Systems		
3.2.2.1	ADS-B (Ground Receive)		
3.2.2.2	TIS-B & ADS-R Sources of Surveillance Information (Ground Transmit) <i>(Are these requirements or assumptions for the Ground Stations?)</i>		
3.3	System Requirements (and ACL)		Parts of DO-289 §2.4 may be moved into §3.3. Top level summary and table of applications.
3.3.1	CDTI	Jonathan Hammer	
3.3.1.1	CDTI for ACL=1	Jonathan Hammer	
3.3.1.2	CDTI for ACL=2	Jonathan Hammer	
3.3.2	ASSAP	Jonathan Hammer	
3.3.3	ADS-B Subsystem Requirements	Tom Pagano	
3.3.3.1	ADS-B Surveillance Coverage	Tom Pagano	
3.3.3.2	ADS-B Information Exchange Requirements by Equipage Class	Tom Pagano	
3.3.3.3	ADS-B Data Exchange Requirements	Tom Pagano	
3.3.3.4	ADS-B Network Capacity	Larry Bachman	
3.3.3.5	ADS-B Medium	Larry Bachman	
3.3.3.6	ADS-B System Quality of Service	Dean Miller	
3.4	Messages and Reports		The Intent Info can be removed IP12-ASA needs to be reviewed as part of this editing. Add broadcast of TCAS RA Message for TCAS equipped aircraft.
3.5	Subsystem Requirements and Assumptions	Rudy Johnson	Section 3.4 of DO-289 should be reviewed and included as necessary
3.6	Functional Level Requirements		No shall statements in this section of DO-242A
4	ADS-B IN System Applications Requirements	Taji Shafaat	
4.1	Enhanced Visual Acquisition (EVACQ) / ATSA-AIRB (Reference only in DO-3xx)		
4.2	Conflict Detection (CD) <i>(TBD)</i>		
4.3	Airport Surface Situational Awareness (ASSA) <i>(Reference only in DO-3xx)</i>		
4.4	Final Approach and Runway Occupancy Awareness (FAROA) <i>(TBD)</i>		
4.5	Enhanced Visual Approach (EVAPP) / ATSA-VSA (Reference only in DO-3xx)		

<u>Sections numbers of DO-3xx</u>	<u>Title of DO-3xx Sections</u>	<u>Author</u>	<u>Comments</u>
4.6	ATSA – SURF (Reference only in DO-3xx)		
4.7	In Trail Procedure (ITP) (Reference only in DO-3xx)		
4.8	SURF IA (TBD)		
4.9	Flight Deck Interval Management – Spacing (FIM-S) (Reference in DO-3xx and add Appendix “I” for intent)		
4.10	Ground-Based Interval Management (TBD) (May move into 3.2.2)		
Appendix A	Acronyms and Definitions of Terms		
Appendix B	Bibliography and References		
Appendix C	Derivation of Link Quality Requirements for Future Applications		
Appendix D	Design Tradeoff Considerations (update old 242A-App_G)		
Appendix E	Receive Antenna Coverage Constraints (update old 242A-App_H)		
Appendix F	Integrity Considerations for ADS-B Applications (rewrite and retitle old 242A-App_I)		
Appendix G	Latency and Report Time Error Data (update old 242A-App_K)		
Appendix H	Derivation of Track Acquisition and Maintenance Requirements (update old 242A-App_L)		
Appendix I	Intent Guidance Material for Future ADS-B Intent Broadcast (update or rewrite old 242A-App_N)		
Appendix J	L/W and Position Offset Coding (old 242A-App_P, renamed and updated with GPS Antenna and L/W Changes)		
Appendix K	Future Air-Referenced Velocity (ARV) Broadcast Conditions (update old 242A-App_Q)		
Appendix L	Determining the Navigation Accuracy Category for Velocity (NAC _v) (rewrite starting with revised Appendix from Link MOPS)		
Appendix M	Compatibility of ASA MASPS with ADS-B Standards and Fielded Systems (update of old 289-App_AE)		
Appendix N	MASPS / Link MOPS Compliance Matrices (alternatively could be published as new Appendices in Changes to DO-260B and DO-282B)		
Appendix O			

<u>Sections numbers of DO-3xx</u>	<u>Title of DO-3xx Sections</u>	<u>Author</u>	<u>Comments</u>
Appendix P			
Appendix Q			
Appendix R			