MASPS for ADS-B Rev. A

Tracking Information (committee secretary only)	
Change Issue Number	36
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Short Title for Change Issue:	Simultaneous Parallel Approaches

MASPS Document Reference:		Originator Information:	
Entire document (y/n)		Name	Gene Wong
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Table/Figure number(s)	Table 2.4a, Table 3.2-1	Other	

Proposed Rationale for Consideration (originator should check all that apply):	
	Item needed to support of near-term MASPS/MOPS development
	DO-260/ED-102 1090 MHz Link MOPS Rev A
	ASA MASPS
	TIS-B MASPS
	UAT MOPS
	Item needed to support applications that have well defined concept of operation
	Has complete application description
	Has initial validation via operational test/evaluation
	Has supporting analysis, if candidate stressing application
X	Item needed for harmonization with international requirements
X	Item identified during recent ADS-B development activities and operational evaluations
X	MASPS clarifications and correction item
X	Validation/modification of questioned MASPS requirement item
	Military use provision item
	New requirement item (must be associated with traffic surveillance to support ASAS)

Nature of Issue:		Editorial		Clarity	X	Performance	X	Functional

Issue Description:

Table 2.4a and Table 3-1 contain incorrect surveillance coverage for ADS-B air-to-ground application in the area of simultaneous parallel approaches.

Table 2.4a, under the last column of “Parallel Runway Conform. Mon.” and corresponding to “Operational Domain Radius (nmi)”, MASPS specifies “10”. Similarly, Table 3-1, last column of Ground Receive Subsystem (class C) and corresponding to ATS Parallel Runway, specifies “approach coverage out to 10 nmi”. FAA’s Precision Runway Monitor (PRM) system specification requires the monitoring of simultaneous parallel approaches up to 30 nmi. In specific airports with Air Traffic Service approval, the surveillance range may be relaxed to the point where the aircraft intercepts the final approach course. If ADS-B ground receiver is to perform equivalent PRM surveillance function, it must provide coverage to 30 nmi, or the point where the aircraft intercepts the final approach course.

Originator's proposed resolution if any:

In Table 2.4a, under the last column of "Parallel Runway Conform. Mon." and corresponding to "Operational Domain Radius (nmi)", replace "10" with "30, or the point where the aircraft intercepts the final approach course".

In Table 3-1, Ground Receive Subsystems (class C), last column and corresponding to "ATS Parallel Runway and Surface Operation", replace "approach coverage out to 10 nmi" with "30 nmi, or the point where the aircraft intercepts the final approach course".

Working Group 6 Deliberations:

May 24, 2001: This issue paper was reviewed at the May WG6 meeting, and it was agreed that the tables mentioned in the Issue Paper (Tables 2.4a, and Table 3.2-1) do contain incorrect information. The suggested resolution will be implemented and this Issue Paper will be addressed in Revision A of DO-242.

February 22, 2002: Final review of the resolution of this Issue Paper was approved by WG6 at their February meeting as part of the review of draft DO-242A.

Working Group 6 Final Resolution:

Attachment A of this Issue Paper shows Tables 2-4(a) and 3-1 as they appear in the draft DO-242A delivered to RTCA on March 4, 2002. The cells changed to address this Issue paper are highlighted in yellow.

Table 2-4a: Summary of Expected ATS Provider Surveillance and Conflict Management Current Capabilities for Sample Scenarios

Information	Operational Capability			
	En Route	**Terminal**	**Airport Surface**	**Parallel Runway Conform Mon.**
Initial Acquisition of A/V Call Sign and A/V Category	**within 24 sec.**	**within 10 sec.**	**within 10 sec.**	**n/a**
Altitude Resolution (ft)	**25**	**25**	**25**	**25**
Horizontal Position Error	**388 m @ 200 NM 116 m @ 60 NM 35 m @ 18 NM**	**116 m @ 60 NM 35 m @ 18 NM**	**3 m. rms, 9 m. bias [15],[6], [11]**	**9 m.**
Received Update Period (Note 2)	**12 sec. [10]**	**5 sec. [6]**	**1 sec.**	**1 sec.**
Update Success Rate	**98%**	**98%**	**98% [6]**	**98%**
Operational Domain Radius (NM)	**200**	**60**	**5**	**30, or the point where the aircraft intercepts the final approach course**
Operational Traffic Densities (# A/V) (Note 3)	**1250 [6]**	**750 [6]**	**100 in motion; 150 fixed**	**50 dual; 75 triple; w/o filter: 150**
Service Availability (%) (Note 4)	**99.999 [10] 99.9 (low alt)**	**99.999 [10] 99.9 (low alt)**	**99.999 [10]**	**99.9**

Table 2-4b Additional Expected Capabilities Appropriate for ADS-B Supported Sample Scenarios

Information	Operational Capability			
	En Route	**Terminal**	**Airport Surface**	**Parallel Runway Conform Mon.**
Altitude Rate Error (1 s) (Note 5)	**1 fps**	**1 fps**	**1 fps**	**1 fps**
Horizontal Velocity Error (1 s)	**5 m/s**	**0.6 m/s**	**0.3 m/s**	**0.3 m/s**
Geometric Altitude	**Yes**	**Yes**	**Yes**	**Yes**

Table 3-1: Subsystem Classes and Their Features

Class	Subsystem	Example Applications	Features	Comments
Interactive Aircraft/Vehicle Participant Subsystems (Class A)				
A0	Minimum Interactive Aircraft/Vehicle	enhanced visual acquisition, conflict detection	Lower transmit power and less sensitive receive than Class A1 permitted.	Minimum interactive capability with CDTI.
A1	Basic Interactive Aircraft	A0 plus airborne conflict management, station keeping	Standard transmit and receive	Provides ADS-B based conflict avoidance and interface to current TCAS surveillance algorithms/ display
A2	Enhanced Interactive Aircraft	A1 plus merging, conflict management, in-trail climb	Standard transmit power and more sensitive receive. Interface with avionics source required for TS and TC+0 report data.	Baseline for separation management employing intent information.
A3	Extended Interactive Aircraft	A2 plus long range conflict management	Higher transmit power and more sensitive receive. Interface with avionics source required for TS, TC+0, and TC+n report data	Extends planning horizon for strategic separation employing intent information.
Broadcast-Only Participant Subsystems (Class B)				
B1	Aircraft Broadcast only	Supports A1 Applications for other participants	Transmit power may be matched to coverage needs. NAV input required.	Enables aircraft to be seen by Class A and Class C users.
B2	Ground vehicle Broadcast only	Supports airport surface situational awareness	Transmit power matched to surface coverage needs. High accuracy NAV input required.	Enables vehicle to be seen by Class A and Class C users.
B3	Fixed obstacle	Supports visual acquisition and airborne conflict management	Fixed coordinates. No NAV input required. Collocation with obstruction not required with appropriate broadcast coverage.	Enables NAV hazard to be detected by Class A users.
Ground Receive Subsystems (Class C)				
C1	ATS En route and Terminal Area Operations	Supports ATS cooperative surveillance	Requires ATS certification and interface to ATS sensor fusion system.	Expected en route coverage out to 200 NM. Expected terminal coverage out to 60 NM.
C2	ATS Parallel Runway and Surface Operation	Supports ATS cooperative surveillance	Requires ATS certification and interface to ATS sensor fusion system.	Expected approach coverage out to 30 NM, or the point where the aircraft intercepts the final approach course Expected surface coverage out to 5 NM.