

<i>Last Updated</i>	<i>Total Count</i>	<i>Open Items</i>	<i>Closed Items</i>	<i>Deferred</i>
8/9/2006	38		4	

Open Items:

No.	Issue Item	Resolution	Status Open/ Closed	Action Item	Assigned
ASSAP SCOPE					
S-1	Which applications are included in this version of ASSAP?	<p>The ASSAP MOPS will be compliant with the ASA MASPS. Regarding which applications are going to be included, we have to follow the direction of the SC186 Program Management Committee. According to the Terms of Reference from the RTCA Program Management Committee (Revision 9), we have to:</p> <p>"1. Develop MASPS for Airborne Surveillance Applications (ASA), including detailed application descriptions and end-to-end requirements analysis, initially for the following applications, enabling codification of these applications:</p> <p>a) Conflict Detection</p> <p>b) Enhanced visual acquisition</p> <p>c) Enhanced visual approaches</p> <p>d) Runway and Final Approach Occupancy Awareness</p> <p>e) Airport Surface Situational Awareness</p> <p>... and:</p> <p>7. Develop MOPS for Airborne Separation</p>	<p>CLOSE PENDING REDIRECTION FROM RTCA PROGRAM MANAGEMENT</p>	AI #14	Roxaneh

No.	Issue Item	Resolution	Status Open/ Closed	Action Item	Assigned
		<p><i>Assistance Systems (ASAS) processing. Develop recommended definitions of Required Surveillance Performance (RSP). ASAS MOPS will specify requirements for airborne surveillance processing, alerting and guidance algorithms, performance, cockpit display of traffic information (CDTI), and avionics interfaces ***in support of the applications specified in the ASA MASPS***. [My emphasis here.] The ASAS MOPS defines how TCAS, ADS-B, and TIS-B traffic is integrated on a CDTI display."</i></p>			
S2	<p><i>Is TQL required in ASSAP?</i></p>	<p><i>For UAT MOPS DO-282 and 1090 MOPS DO-260A, bits are reserved but the transmit equipment will not support these bits. However, basic and intermediate applications can use actual data quality parameters and current DO-242A requirements. (Reference: ASA MASPS, Table AE-2)</i></p>	<p>CLOSED PUT IN NOTE IN DOC</p>	<p>AI #7</p>	<p><i>Roxaneh</i></p>
S3	<p><i>Is ACL required in ASSAP?</i></p>	<p><i>For UAT MOPS DO-282 and 1090 MOPS DO-260A spare bits are available bur the transmit equipment will not support these bits. However, basic and intermediate applications need no knowledge of ACL to operate. (Reference: ASA MASPS, Table AE-2)</i></p>	<p>CLOSED PUT IN NOTE IN DOC</p>	<p>AI #7</p>	<p><i>Roxaneh</i></p>
S4	<p>How do we define the minimum requirements for Application Processing?</p>	<p>There are two options: (1) Provide performance requirements, i.e. determine performance metrics with thresholds and tolerances that can be tested. This provides greater flexibility to the vendor. (2) Provide the algorithm along with test cases for design verification to be conducted on the real-time system. This is more desirable for coupled applications.</p>	<p>CLOSED? PREFERENCE IS FOR OPTION 1</p>	<p>AI #15</p>	<p><i>ALL</i></p>
S5	<p>Should database inputs such as surface maps be defined in ASSAP?</p>	<p>No. According to ASA MASPS section 3.4.5: "The airport surface map is necessary to support the ASSA and FAROA</p>	<p>OPEN PENDING</p>	<p>AI #1</p>	<p><i>Roxaneh,</i></p>

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		<p>applications for each airport where these applications are used. The subsystem that provides the airport surface maps is external to ASA system boundaries defined in this MASPS. Airport maps are assumed to be encoded into an electronic database.” Database requirements are covered in other documents, e.g., DO-272, DO-257A. Add Don’s comment. “As long as the applications in ASSAP do not provide alerts for Runway or Surface conflicts, ASSAP does not need to have a surface database. In order to carry out conflict detection for occupied runways or runway crossings, ASSAP will need a runway database. In order to do alerts in other movement areas, ASSAP would need detailed surface movement databases.”</p> <p>AI: Bill Thedford will verify if ASSAP has to consider database input requirements.</p>			<i>Don, Bill</i>
S6	What are the risks/issues for requiring Do-260A vs. DO-260A)?	Write issue paper.	OPEN		Assign
INTERFACE Between ASSAP & CDTI and ASSAP & ADS-B/TIS-B Receiver					
11	<i>Are control panel / pilot input sent via CDTI to ASSAP?</i>	<i>Yes, see ASA MASPS Figure 2-6 which illustrates the ASA system with emphasis on external interfaces..</i>	CLOSED		<i>Roxaneh</i>
12	Is the selection of an application external to the ASSAP?	<p>This is not clear to me from the ASA MASPS:</p> <p>1.3.7.1: Background applications are those applications that apply to all surveilled traffic of operational interest. These applications may be in use in some or all airspace (or on the ground), but without flight crew input or automated inout to select specific traffic. Background applications include EVacq, CD, ASSA, and FAROA.</p> <p>1.3.7.2: Coupled applications are those applications that operate only on specifically- chosen (either by the flight crew or automation) traffic. They generally operate only for a specific flight operation.</p>	OPEN	AI #16	

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		<p>Thus, it appears that EVacq, CD, ASSA and FAROA are background (i.e., simultaneous) applications.</p> <ul style="list-style-type: none"> How is the transition between ASSA and FAROA (both background applications) made? <p>The only selected application is the EVappr. Are selected applications initiated by the pilot via the control panel and passed to the ASSAP via the CDTI interface? What information is passed to indicate when a selected application is started or terminated?</p>			
I3	What is the minimum number of tracks sent to the CDTI?	<p>Issue Paper: ACSSASSAPMOPSAI4.ppt</p> <p>The ASA MASPS specifies that a minimum of 30 traffic symbols (R3.270) be supported by the CDTI. What is this number based on?</p> <p>Proposed Requirement:</p> <ul style="list-style-type: none"> ASSAP shall provide a minimum number of 30 airborne and 30 ground traffic to the CDTI. <p>Note: A minimum number of 30 airborne aircraft is based on satisfying the EVacq application based on basic visual aid criteria learned from TCAS experience. The minimum number of 30 ground traffic is based on satisfying the operationally significant number of traffic required of ASSA and FAROA applications.</p>	OPEN	AI #4 AI #13	ACSS
I4	Should the prioritization/filtering take place in the ASSAP or CDTI?		OPEN		ACSS
I5	What is the priority selection logic of tracks shown on the CDTI?		OPEN		ACSS
I6	How is the TCAS Tag / Cross-Reference Information used by CDTI,? How should it be generated?	When correlation between TCAS and another surveillance source (i.e., the best of ADS-B/ADS-R or TIS-B) is detected and passed on to the CDTI, how does the CDTI decide which	OPEN	AI #5	

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	When is a TCAS symbol shown on the CDTI?	<p>source position to show? One proposal: TCAS track is displayed when the correlating ADS-B or TIS-B falls outside the “Hybrid Surveillance” validation window. Concern: if displayed at different altitudes and TCAS resolution advisory indicates a climb/descent into ADS-B track, this could lead to confusion.</p> <p>Should the decision be based on additional info from ASSAP such as:</p> <ul style="list-style-type: none"> • quality (accuracy & integrity); • type of correlation (i.e., strong, degraded, ambiguous; see strawman FA presentation) <p>or should it selected via the control panel by the operator?</p>			
I7	How is the Assured Normal Separation Distance (ANSD) generated for the CD application?	Appendix D: “Initially the pilot or system will change the ANSD for different phases of flight, or varying operating environments.” If it is determined that the system has to change it, how does the system do it?	OPEN		
I8	The use of TIS-B Service Indicator is still being considered. Start this issue discussion with an update of that status. Define what should constitute the TIS-B Service-Indicator that might be sent from ASSAP to CDTI. How will the CDTI announce that ownship is within service volume?	The TIS-B service status is conveyed via the 1090ES Management Message or the UAT Ground Uplink Message. These would need to be parsed to derive the in-service-indicator and passed on to the CDTI.	OPEN		
I9	If the CDTI must accommodate the display of traffic data with simultaneous overlay of terrain or FIS-B products when integrated into an MFD, do any of the resulting requirements affect the interface between ASSAP and CDTI?		OPEN		ASSIGN

I10	Are 1090 Reports assembled (i.e., full state vectors) when received by ASSAP?		OPEN		ACSS
Surveillance Processing					
SP1	Is the ICAO address received via 1090 MHz unique?	<p>ACSS argued that the ICAO address received on 1090 MHz is assumed to be unique per DO-260A, DO-181C, ED 73B, and ICAO Annex 10 Volume IV. Currently, DO-260 A relies on the reception of unambiguous addresses to assemble state reports received on multiple squitter messages.</p> <p>But there have been cases where duplicate addresses were observed. This could happen if the installer left a default value or entered the wrong value.</p> <p>In Capstone, the MicroEARTS accounts for duplicate addresses.</p> <p>AI: Bill T.: Provide probability estimates for duplicate addresses. Is it a minimum requirement to show all targets? Ruy: What is the safety impact of displaying none in such a case? Determine frequency and apply it to the fault tree analysis. Roxaneh: Has RFG performed risk assessment for air-to-air applications? Allen Branch: Find out FAA's risk assignment on not displaying a target for these applications.</p>	OPEN	AI #17	Ruy, Tom, Bill, Allen
SP2	What is the tracking capacity (i.e., minimum number of tracks to be supported)?	<p>Issue Paper: ACSSASSAPMOPSAI3_13.ppt</p> <ul style="list-style-type: none"> ■ The CD application requires the greatest “airborne” coverage volume of 45 NM and +/- 15,600 ft (of the 5 applications in consideration) <ul style="list-style-type: none"> ■ According to the ASA MASPS, Table 3-11 for LA2020 has 257 “airborne” aircraft in a 50NM 	OPEN	AI #3 AI#13 AI#27 AI#28	Tom, Larry, Allen

		<p>range</p> <ul style="list-style-type: none"> ■ Need help to determine if the coverage volume is actually less in high-density airspace in order to reduce the number of traffic to be tracked ■ Excerpts from the ASA MASPS: From pg. D-2, “The CD application will be used in all airborne airspace domains, i.e., en route, terminal, and oceanic/remote.” ■ According to the ASA MASPS, the ASSA and FAROA applications define a “surface” coverage as follows (excerpt from the ASA MASPS; same for FAROA): <ul style="list-style-type: none"> ■ “The ASSA application shall be able to process and display all operationally significant traffic. ■ Note: Operationally significant traffic for ASSA includes at least the 10 closest airborne vehicles and the 30 closest surface A/Vs. <p>Larry: Provide the number and types of traffic in the LA2020scenario ithin 12 NM and +/-4000ft. Allan: hat is the plan for equipage of surface vehicles. This will validate how many ground vehicles ASSAP will have to monitor.</p>			
SP3	What logic should be used for Best Track Source Selection	<p>Wichgers_Strawman_Track_Selection_Logic_2006-05-16.ppt</p> <ol style="list-style-type: none"> 1 Selection Process (Until one “best” track is available) <ul style="list-style-type: none"> – 1) Select Track with both Valid Position and Velocity State Data <ul style="list-style-type: none"> • Airborne: First select sources that have both valid position and velocity. If there are none, then just select sources that have valid “position”. • Ground: Select sources with valid position. • Without “valid” position, there is no valid track. – 2) Select Track with highest TQL <ul style="list-style-type: none"> • All current ADS-B and TIS-B Link MOPS are interpreted as TQL=0. Future revisions of the Link MOPS are expected to comply with the ASA MASPS TQL. 	CLOSED?	AI #6	Joel

		<ul style="list-style-type: none"> - 3) Select Track with best integrity for most stringent Active ASA Application • For tracks with $SIL \geq 1$, select track with smallest containment region (highest NIC) ➤ $SIL \geq 1$ satisfies Basic and Intermediate ASA applications requirements ➤ When the ASSAP MOPS is written to address higher ACLs, then we may need to expand the integrity screening of step 3 (e.g., first select tracks with $SIL \geq 2$) to satisfy the “shall” requirement to optimize the track selection to the applications being run - 4) Select Track with best position accuracy (highest NACP) - 5) Select Track with best velocity accuracy (highest NACV) - 6) If more than one track is still available, select any of the tracks that remain. They are equivalent. • Would like to select ADS-B Track over TIS-B Track [if known] ➤ Rationale: TIS-B probably has more lag with all the other parameters equal 			
SP4	How are TIS-B/ADS-B/TCAS tracks correlated?	Spatial correlations will have to be used for TIS-B since the addresses may be unique to the ground station and not match the ADS-B or TCAS address. This is also the case if TCAS report does not include Mode S address.	CLOSED?		Roxaneh
SP5	Do we need to compensate for TIS-B latency?		OPEN	AI#19	
SP6	Are there any issues with receiving messages from multiple links for the same a/v (i.e., UAT and 1090)?		OPEN	AI # 8	Roxaneh
SP7	Are there concerns with meeting ASA MASPS R3.210: Latency for the combination of ASSAP and the CDTI shall	Open for modification from ASA MASPS. An issue paper is needed to change these thresholds if necessary.	OPEN	AI #9	Jonathan, Joel

	(R3.210) be less than 400 ms for targets that are used by coupled applications, targets against which there is an alert, and the 10 highest priority targets.				
SP8	Are there concerns with meeting ASA MASPS R3.188: Track estimation shall (R3.188) extrapolate all established tracks to a common time within one-second of delivery to ASA applications or the CDTI interface.	Open for modification from ASA MASPS. An issue paper is needed to change these thresholds if necessary.	OPEN	AI #9	Jonathan, Joel
SP9	Are there concerns with meeting ASA MASPS R3.178: The tracking function shall (R3.178) terminate a track when the maximum coast interval has been exceeded for all of the applications for which the track is potentially being used.	Open for modification from ASA MASPS. An issue paper is needed to change these thresholds if necessary.	OPEN	AI #9	Jonathan, Joel
SP10	Are there concerns with meeting ASA MASPS p144: The maximum latency of the navigation data outputs to the ASA system will be less than 2 seconds (ASA MASPS, Page 144)	Open for modification from ASA MASPS. An issue paper is needed to change these thresholds if necessary.	OPEN	AI #9	Jonathan, Joel
SP11	What level of validation is required?	Unresolved. Check into DO-249.		AI #20	
SP12	Define the Functional Architecture	Issue Paper: ASSAS Strawman Functional Architecture The purpose of laying out the functional architecture and discussing the key functions that must be performed is to	OPEN		Roxaneh

		establish a disciplined approach to ensuring that we develop a full set of requirements (i.e., discover if there are holes in the ASA MASPS) and fill in the details on requirements that were only partially developed in the MASPS.			
SP13	What are the performance metrics for SP functions?		OPEN		Larry, Randy
SP14	Duplicate address issue.	<ol style="list-style-type: none"> 1. Has RFG or the FAA performed a risk assessment of not displaying any targets when they have the same address? 2. Check ASA MASPS safety analysis for the case when a target is not displayed. 3. What is the likelihood of duplicate addresses? 	OPEN	AI#22 AI#23 AI#24	Ruy Allan Roxaneh
SP15	Does NAC have to be extrapolated?	<p>The strawman functional architecture paper proposed a method for extrapolating the quality (NAC) to meet the following ASA MASPS requirement: “ASSAP shall (R3.188) deliver track reports to the CDTI for all aircraft of sufficient quality for at least enhanced visual acquisition, extrapolated to a common time that is within 1 second of the time the data is delivered to the CDTI, with at least a 1 Hz rate.” A discussion ensued as to the rationale behind this MASPS requirement.</p> <p>Comment: Could this be tied to the usability requirement (R3.288 c)?</p>			Roxaneh
SP16	Is assignment of a unique track number required?	<p>The strawman functional architecture paper proposed a method for detecting distinct targets that share the same identifier and “splitting” them into unique track IDs and recommended making it a requirement. The team thought it was an internal function and should not be a requirement.</p> <p>Comment: The ASA MASPS has a requirement that ASSAP assign a unique track number. “The ASSAP track ID is a unique identifier from ASSAP to the CDTI that identifies the traffic for which data is being provided.</p>			Roxaneh

		The ASSAP subsystem shall (R3.272) provide to the CDTI, and the CDTI subsystem shall (R3.271b) accept from the ASSAP subsystem, a unique ASSAP track ID for traffic to be displayed.”			
SP17	Are the ADS-B reports that are processed by ASSAP “pre-filtered” or “raw measurements?”	Excerpts from “GPS User Equipment Introduction”: “A GPS receiver measures pseudoranges and pseudorange rates to the satellites. Knowing the position of the satellites from the decoded navigation messages, the user position and GPS system time can be calculated from four or more satellites. A GPS receiver, however, can never measure exact range to each satellite. The measurement process is corrupted by noise which introduces errors into the calculation. This noise includes errors in the ionospheric corrections and system dynamics not considered during the measurement process (e.g., user clock drift). A Kalman filter characterizes the noise sources in order to minimize their effect on the desired receiver outputs.”			Roxaneh
SP18	How long should ASSAP wait to declare an (established) TIS-B or ADS-B track?	There were different opinions on this issue. One point of view was to wait for a number of reports before declaring a track to avoid false tracks. Another view was to declare a track after the first unassociated report because (a) in the case of TIS-B these are already pre-tracked, and (b) in certain cases (e.g., on take-offs) detection time may be of essence.			Roxaneh
APPLICATION PROCESSING					
AP1	How is In-Service-Indicator generated?	The TIS-B service status is conveyed via the 1090ES Management Message or the UAT Ground Uplink Message. These would need to be parsed to derive the in-service-indicator and passed on to the CDTI.	OPEN		
AP2	If ANSD is determined by the system based on phase of flight, how is it done?	Appendix D: “Initially the pilot or system will change the ANSD for different phases of flight, or varying operating environments.” If it is determined that the system has to change it, how does the system do it?	OPEN		

AP3	How can the NIC values be scaled to correspond to SIL values that differ from those specified in the ASA MASPS?		OPEN	AI#31	Joel
AP4	Determine the availability of 1 NM HPL for existing TSO C129 sensors		OPEN	AI#29	Don