

<i>Last Updated</i>	<i>Total Count</i>	<i>Open Items</i>	<i>Closed Items</i>	<i>Deferred</i>
11/2/2006	43			

Open Items:

<b>No.</b>	<b>Issue Item</b>	<b>Resolution</b>	<b>Status Open/ Closed</b>	<b>Action Item</b>	<b>Assigned</b>
<b>ASSAP SCOPE</b>					
S-1	<i>Which applications are included in this version of ASSAP?</i>	<p><i>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:</i></p> <p><i>"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:</i></p> <p><i>a) Conflict Detection</i></p> <p><i>b) Enhanced visual acquisition</i></p> <p><i>c) Enhanced visual approaches</i></p> <p><i>d) Runway and Final Approach Occupancy Awareness</i></p> <p><i>e) Airport Surface Situational Awareness</i></p> <p><i>... and:</i></p> <p><i>7. Develop MOPS for Airborne Separation 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>	<b><i>CLOSE PENDING REDIRECTIO N FROM RTCA PROGRAM MANAGEMENT NT</i></b>	<b><i>AI #14</i></b>	<b><i>Roxaneh</i></b>
S2	<i>Is TQL required in ASSAP?</i>	<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>	<b><i>CLOSED PUT IN NOTE IN DOC</i></b>	<b><i>AI #7</i></b>	<b><i>Roxaneh</i></b>

No.	Issue Item	Resolution	Status Open/ Closed	Action Item	Assigned
S3	Is ACL required in ASSAP?	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)	<b>CLOSED PUT IN NOTE IN DOC</b>	<b>AI #7</b>	<i>Roxaneh</i>
S4	How do we define the minimum requirements for Application Processing?	<p>There are two options:</p> <p>(1) Provide performance requirements, i.e. determine performance metrics with thresholds and tolerances that can be tested. This provides greater flexibility to the vendor.</p> <p>(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>	<b>CLOSED PREFERENCE IS FOR OPTION 1, WITH ALGORITHM AS GUIDANCE IN AN APPENDIX</b>	AI #15	<i>ALL</i>
S5	Should database inputs such as surface maps be defined in ASSAP?	<p>No, it is not needed. According to ASA MASPS section 3.4.5: “The airport surface map is necessary to support the ASSA and FAROA 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>PUT THIS in the Assumptions Section. See minutes.</p> <p>AI: Bill Thedford will verify if ASSAP has to consider database input requirements.</p>	<b>CLOSED (ADD INTO ASSUMPTIONS SECTION)</b>	<b>AI #1</b>	<i>Roxaneh, Don, Bill</i>
S6	What are the risks/issues for requiring Do-260A vs. DO-260)?	Write issue paper.	<b>OPEN INTO ASSUMPTIONS</b>		<i>Don</i>
S7	Investigate display differences in traffic information between	See issue paper ASSAP-WP08-10_Issue S7 Action Item 51_Display Diff.ppt (Roxaneh): 1. Identical ADS-B target display information between CDTI and ATC cannot be guaranteed because of different requirements levied on ATC Surveillance Application	<b>PROPOSE TO CLOSE</b>	<b>AI #51</b>	<i>Roxaneh</i>

No.	Issue Item	Resolution	Status Open/ Closed	Action Item	Assigned
	CDTI and ATC display	<p>vs. Air-to-Air Applications.</p> <ul style="list-style-type: none"> <li>• Different Requirements on Integrity <ul style="list-style-type: none"> <li>– ATC: The ATC Automation Function shall use the <i>integrity and accuracy</i> information in the ADS-B Report to determine whether tracks should be updated with the report<sup>1</sup>. (Note, currently for Capstone the MEARTS requires NIC &lt; 4 to display ADS-B on glass.) <ul style="list-style-type: none"> <li>• DO-260A compliance will be mandated for the ATC surveillance application (because integrity is used by the ATC function to determine the eligibility of a report for update).</li> </ul> </li> <li>– CDTI: EVacq does not require a minimum integrity (see Note 2 of Table C-2 of ASA MASPS), targets with unknown integrity could be displayed. <ul style="list-style-type: none"> <li>• DO-260 compliance has not been ruled out for air-to-air applications.</li> </ul> </li> </ul> </li> <li>• Different Requirements on Validation* <ul style="list-style-type: none"> <li>– ATC: The ATC Automation Function shall validate the position of ADS-B Reports with other surveillance sources when the surveillance source data is available<sup>1</sup>.</li> <li>– CDTI: This type of validation cannot be performed on the avionics. Therefore, the avionics could show reports that are filtered out by the ATC function.</li> </ul> </li> <li>• Different Update Rates <ul style="list-style-type: none"> <li>– ATC: The ATC automation may decimate the ADS-B to meet a fixed update interval. In other words, it may not show the ADS-B every second in mixed environments (i.e., radar and ADS-B). (However, it will use every ADS-B update for safety functions.)</li> <li>– CDTI: (1) The ASA MASPS (R3.188) requires ASSAP to deliver track reports to the CDTI with at least a 1 Hz update rate. (2) The BCS shall rate limit the ADS-R sent to the LSP to prevent overloading the data links.</li> </ul> </li> </ul> <p>2. Identical display information of non ADS-B targets between CDTI and ATC cannot be guaranteed for the following reasons:</p> <ul style="list-style-type: none"> <li>• Measurements vs. Tracked Data <ul style="list-style-type: none"> <li>○ The ATC function displays measurements (e.g., radar plots) on the Controller Display.</li> <li>○ The BCS generates tracks from sensor inputs (i.e., TIS-B reports received by ASSAP will be track data).</li> </ul> </li> <li>• Different Source Selection/ Update Rate <ul style="list-style-type: none"> <li>○ The surveillance sources sent to the Broadcast Services function may</li> </ul> </li> </ul>	AFTER REVIEW		

No.	Issue Item	Resolution	Status Open/ Closed	Action Item	Assigned
		<p>differ from those sent to the ATC automation function.</p> <ul style="list-style-type: none"> <li>○ ATC may use a single source (Mosaic or Single Sensor Mode); the update rate may be limited to the single sensor selected.</li> <li>○ BCS may generate a track by fusing the reports from a different set of sensors; the update rate may be higher due to fusion of multiple sensors.</li> </ul> <p>Conclusion:</p> <ul style="list-style-type: none"> <li>• Identical display of traffic information of ADS-B or non ADS-B targets between the CDTI and ATC cannot be guaranteed because of potential differences in data sources and differences in processing.</li> <li>• The five applications within the scope of this MOPS are advisory and for situational awareness only. The existing control on this hazard is that the pilot must follow see and avoid rules.</li> <li>• Steps to ensure low residual risk for this hazard: <ul style="list-style-type: none"> <li>– Pilot training to avoid over-reliance on CDTI .</li> <li>– FAA procedures that instruct the pilot to comply with ATC instructions regardless of information presented on the CDTI.</li> </ul> </li> </ul>			
<b>INTERFACE Between ASSAP &amp; CDTI and ASSAP &amp; ADS-B/TIS-B Receiver</b>					
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>	<b>CLOSED</b>		<i>Roxaneh</i>
12	Is the selection of an application external to the ASSAP?	<p>ASA MASPS</p> <ul style="list-style-type: none"> <li>• 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 input to select specific traffic. Background applications include EVacq, CD, ASSA, and FAROA.</li> <li>• 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.</li> </ul> <p>Thus, it appears that EVacq, CD, ASSA and FAROA are background (i.e., simultaneous) applications.</p> <p>How is the transition between ASSA/ FAROA and EVAcq (background applications) made?</p> <ul style="list-style-type: none"> <li>• From CDTI minutes in Seattle: “Jonathan suggested that for ASSA and FAROA, (and perhaps other applications), there should be no need to “switch”</li> </ul>	<b>OPEN (DON WILL LOOK FOR DATA TO SEE IT THIS MAKES SENSE)</b>	AI #16	

No.	Issue Item	Resolution	Status Open/ Closed	Action Item	Assigned
		<p>between applications, but to have the application defined as the use of the CDTI. So, for instance, the airborne targets would be flagged as “good” if the data supports EVAcq, while targets on the ground would be flagged as “good” only if they meet the ASSA or FAROA requirements.”</p> <ul style="list-style-type: none"> <li>• This may cause an issue when traffic transitions back and forth between airborne and on-ground since the display requirements are different. <ul style="list-style-type: none"> <li>○ Action Item (Jonathan, Sethu): The CDTI and ASSAP group agreed that the application selection issue needs further discussion. Two proposals from Jonathan and Sethu will be further discussed.</li> </ul> </li> </ul> <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> <p>CDTI minutes from joint meeting in Seattle:</p> <ul style="list-style-type: none"> <li>• EVApp: “Pilot should be able to turn on and off, as a minimum. Other automation may be used.”</li> <li>• ASSAP comment: turn on/off means selecting/deselecting target as a minimum.</li> <li>• EVAcq: Is defined as operating everywhere, including on the ground.</li> <li>• CD: CD should turn off and on similar to TCAS I (or II), based on altitude.</li> </ul> <p>ASSAP meeting 11/7: Modify Jonathan’s recommendation to send additional info between CDTI/ASSAP regarding degraded quality for ASSA and EVAcq.</p>			
I3	What is the minimum number of tracks sent to the CDTI?	<p>Issue Paper: ACSSASSAPMOPSAI4.ppt (Tom E.)</p> <ul style="list-style-type: none"> <li>• The ASA MASPS specifies that a minimum of 30 traffic symbols (R3.270) be supported by the CDTI. What is this number based on?</li> <li>• Proposed Requirement: <ul style="list-style-type: none"> <li>○ ASSAP shall provide a minimum number of 30 airborne and 30 ground traffic to the CDTI.</li> <li>○ 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.</li> </ul> </li> </ul> <p>From ASSAP minutes at Seattle meeting:</p> <ul style="list-style-type: none"> <li>• CDTI Action Item: The CDTI group will provide the minimum number of traffic required to display to the ASSAP group. This number will drive the minimum number of traffic required for ASSAP to send to the CDTI.</li> </ul>	<p><b>OPEN</b> <b>CDTI WILL DETERMINE THIS RQMT</b></p>	<p>AI #4 AI #13</p>	<p>ACSS</p>

No.	Issue Item	Resolution	Status Open/ Closed	Action Item	Assigned
14	Should the prioritization/filtering take place in the ASSAP or CDTI?	Prioritization/filtering should take place in the ASSAP (from Aug meeting in Seattle).	CLOSED		ACSS
15	What is the priority selection logic of tracks shown on the CDTI?	<p>From CDTI minutes in Seattle: “A prioritization scheme was developed, with the ability within ASSAP to track at least TBD(120?) tracks. Some amount of these will be sent to CDTI, prioritized as such:</p> <ul style="list-style-type: none"> <li>• RA</li> <li>• TA</li> <li>• ASA applications Alerts</li> <li>• Coupled</li> <li>• Selected</li> <li>• Closest in range/altitude (look at TCAS example on AI #38, ASSAP-WP08-16, -25)</li> </ul> <p>Tom Eich says that the DTIF should be able to handle about 127 ADS-B targets on the bus to the display. The CDTI subgroup will come up with some minimum capability number for sending the tracks to the CDTI for display.”</p>	OPEN		ACSS
16	How is the TCAS Tag / Cross-Reference Information used by CDTI? How should it be generated? When is a TCAS symbol shown on the CDTI?	<p>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 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. Should the decision be based on:</p> <ul style="list-style-type: none"> <li>• quality (accuracy &amp; integrity);</li> <li>• closest to ownship</li> <li>• selection via the control panel by the operator?</li> <li>•</li> </ul> <p><b>Resolve slight differences in minutes:</b>  From CDTI minutes at Seattle meeting:</p> <ul style="list-style-type: none"> <li>• TCAS tagging means that TCAS also tracked that target (or, it matched the correlation, anyway). <b>Tagging should be mandatory for interface, but optional for display.</b> For a TCAS display mode (if mandatory), the data could be obtained from the separate path direct to CDTI from TCAS.</li> <li>• It may be required for systems with an integrated TCAS/CDTI, but not for systems with a separate TCAS display. (That is, a TCAS only display indicates to the flight crew that TCAS is monitoring those aircraft. )</li> </ul>	OPEN	AI #5	

No.	Issue Item	Resolution	Status Open/ Closed	Action Item	Assigned
		<ul style="list-style-type: none"> <li>Best data will be used for TIS-B/TCAS correlated data (not one closest to own-ship). Issue don't know what "best" means.</li> <li>Data for data block may or may not be included with all traffic in file. That is, it could be sent for just the selected target.</li> </ul> <p>From ASSAP minutes at Seattle meeting:</p> <ul style="list-style-type: none"> <li>Traffic sources are tagged when they are correlated with TCAS. ASSAP has decided that this tagging is an option (and MOPS can write requirements for the option). <b>This issue may have to be re-addressed in the future to determine if it is required by the CDTI.</b></li> <li>If you are carrying an ASSAP and TCAS then the tagging is mandatory. What is CDTI going to do with this?? If this is optional for display why isn't this optional for the whole system.</li> </ul>			
I7	How is the Assured Normal Separation Distance (ANSD) generated for the CD application?	<p>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?</p> <p>CDTI minutes from Seattle: "ASSAP will accept number from someplace. CD says it is pilot selectable. If there is automation or an integrated system, it <u>could</u> come in from someplace other than CDTI. ASSAP will have to feed back ANSD to CDTI."</p> <p>ASSAP minutes from Seattle: "ASSAP needs the ANSD value which could come from various sources such as a pilot input from the CDTI, a ground link, or an automated method based on phase of flight. The CDTI group will require an ANSD annunciation to be displayed on the CDTI."</p>	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 annunciate that ownship is within service volume?	<p>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.</p> <p>Propose we resolve difference in CDTI vs ASSAP minutes at the joint meeting in Seattle:</p> <ul style="list-style-type: none"> <li>From CDTI Minutes of Seattle meeting: "It was decided that the TIS-B in-service flag should be provided to the pilot. The CDTI subgroup will make a requirement for displaying this information."</li> </ul>	OPEN PENDING PROGRAM OFFICE DIRECTION		

		<p>Display of TIS-B coverage volume will be included as optional.”</p> <ul style="list-style-type: none"> <li>From Aug meeting ASSAP minutes: “The CDTI group proposed making provision for an optional annunciation on the CDTI when ownership is outside service coverage. Should the actual service volume boundaries be supplied to the CDTI for display? Based on the implementation for determining the actual service volume, ASSAP may have to calculate the service volume and provide a flag to the CDTI.”</li> </ul> <p>Program made decision not define for 1090. Will it be in for UAT in the final spec?</p>			
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?	<p>From ASSAP minutes of Seattle meeting:</p> <ul style="list-style-type: none"> <li>This is currently out of the scope for ASSAP but may be considered in the future. This issue will not be discussed with the CDTI group.</li> </ul>	CLOSE		ASSIGN
I10	Are 1090 Reports assembled (i.e., full state vectors) when received by ASSAP?	<p>See paper ACSSASSAPMOPSIssueI10.ppt (Tom E.)</p> <ul style="list-style-type: none"> <li>Yes, the Creation and Update of ADS-B Reports are based on Figure 2-22 in DO-260A and the associated section paragraph requirements (2.2.10.4.1.2 for airborne A/Vs and 2.2.10.4.2.2 for surface A/Vs).</li> </ul>	CLOSED		ACSS
I11	General comment on ASSAP/CDTI interface.	CDTI minutes from Seattle: “It was agreed that the interface definition would not need to be honored if ASSAP and CDTI are implemented in the “same box”, but the performance (end to end) would have to be met.”	CLOSED		
I12	Discuss how ASSAP will annunciate failures to the CDTI. What are the CDTI timing requirements for switching from ASSAP to TCAS traffic when ASSAP has failed?	“Requirement added to interface section: ASSAP has to annunciate to CDTI within xx sec that it has failed.”	CLOSED		
<b>Surveillance Processing</b>					
SP1	Is the ICAO address received via	ACSS argued that the ICAO address received on 1090 MHz is	CLOSED	AI #17	Ruy,

	1090 MHz unique?	<p>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:</p> <ul style="list-style-type: none"> <li>• Bill T. AI #21: Provide probability estimates for duplicate addresses. Is it a minimum requirement to show all targets?</li> <li>• Ruy AI #24: What is the safety impact of displaying none in such a case? Determine frequency and apply it to the fault tree analysis.</li> <li>• Roxaneh AI#22: Has RFG performed risk assessment for air-to-air applications? <ul style="list-style-type: none"> <li>○ Obtained Stu's response: "The RFG has yet to do any risk assessments for the air-to-air applications. I hope the group will begin looking at the Visual Spacing on Approach application this fall. Please do let them know if any of your ASSAP work identifies areas the RFG should consider during its safety assessments."</li> </ul> </li> <li>• Allen Branch AI#23: Find out FAA's risk assignment on not displaying a target for these applications.</li> </ul> <p>On the 1090 ES it is not an ASSAP issue.</p> <p>In UAT, at a minimum you should track the closest one.</p>		<b>AI #21</b> <b>AI #22</b> <b>AI #23</b> <b>AI #24</b>	<i>Tom, Bill, Allen, Roxaneh</i>
SP2	What is the tracking capacity (i.e., minimum number of tracks to be supported)?	<p>Issue Paper: ACSSASSAPMOPSAI3_13.ppt (Tom E.)</p> <ul style="list-style-type: none"> <li>■ 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"> <li>■ According to the ASA MASPS, Table 3-11 for LA2020 has 257 “airborne” aircraft in a 50NM</li> </ul> </li> </ul>	<b>OPEN</b>	<b>AI #3</b> <b>AI#13</b> <b>AI#27</b> <b>AI#28</b>	<i>Tom, Larry, Allen</i>

		<p>range</p> <ul style="list-style-type: none"> <li>▪ 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</li> <li>▪ 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.”</li> </ul> <p>■ According to the ASA MASPS, the ASSA and FAROA applications define a “surface” coverage as follows (excerpt from the ASA MASPS; same for FAROA):</p> <ul style="list-style-type: none"> <li>▪ “The ASSA application shall be able to process and display all operationally significant traffic.</li> <li>▪ <i>Note: Operationally significant traffic for ASSA includes at least the 10 closest airborne vehicles and the 30 closest surface A/Vs.</i>”</li> </ul> <p>Randy/Mike/Larry: Provide the number and types of traffic in the LA2020scenario ithin 12 NM and +/-4000ft. From paper TrafficCapacityRequirementsV2.doc (Randy)</p> <ul style="list-style-type: none"> <li>• The first two rows indicate the required processing capacity is around 230 targets (only airborne aircraft are of concern in CD), regardless of the altitude limits. Row 3 indicates that the processing capacity reduces to 125 targets for an aircraft at 20,000 ft. It can be argued that the en route coverage volume should not be applied below en route altitudes. Row 4 indicates that the en route requirements reduce to 114 targets when the terminal coverage volumes are applied below 10,000 ft. Row 5 indicates the terminal domain requires a processing capacity of 93 airborne targets. In the case that both FAROA and CD applications are in use, 30 ground targets are added to the airborne targets, increasing the terminal processing capacity to around 120 targets.</li> </ul> <p>From Paper ASSAP-WP07-07_Traffic Densities From LA2020 Traffic Scenario.ppt (Randy/Mike)</p> <ul style="list-style-type: none"> <li>▪ Distributions of Aircraft and Ground Vehicles in LA2020 scenario within 12NM of center and below 8,000 ft. (worst case scenario of +/- 4,000 ft requirement)</li> <li>▪ Statistical results are from 4 runs of TrafGen tool, which implements LA2020 scenario definition.</li> <li>▪ These counts are slightly different from the</li> </ul>			
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		<p>originally reported count of 200 Aircraft which was for &lt;4,000 ft (vs. &lt; 8,000 ft).</p> <p>Allan: what 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 (Joel)</p> <ol style="list-style-type: none"> <li>1 <b>Selection Process (Until one “best” track is available)</b> <ul style="list-style-type: none"> <li>– <b>1) Select Track with both Valid Position and Velocity State Data</b> <ul style="list-style-type: none"> <li>• Airborne: First select sources that have both valid position and velocity. If there are none, then just select sources that have valid “position”.</li> <li>• Ground: Select sources with valid position.</li> <li>• Without “valid” position, there is no valid track.</li> </ul> </li> <li>– <b>2) Select Track with highest TQL</b> <ul style="list-style-type: none"> <li>• 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.</li> </ul> </li> <li>– <b>3) Select Track with best integrity for most stringent Active ASA Application</b> <ul style="list-style-type: none"> <li>• For tracks with <math>SIL \geq 1</math>, select track with smallest containment region (highest NIC) <ul style="list-style-type: none"> <li>➤ <math>SIL \geq 1</math> satisfies Basic and Intermediate ASA applications requirements</li> <li>➤ 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 <math>SIL \geq 2</math>) to satisfy the “shall” requirement to optimize the track selection to the applications being run</li> </ul> </li> </ul> </li> <li>– <b>4) Select Track with best position accuracy (highest NACP)</b></li> <li>– <b>5) Select Track with best velocity accuracy (highest NACV)</b></li> <li>– <b>6) If more than one track is still available, select any of the tracks that remain. They are equivalent.</b> <ul style="list-style-type: none"> <li>• Would like to select ADS-B Track over TIS-B Track [if known]</li> </ul> </li> </ul> </li> </ol>	<b>CLOSED</b>	AI #6	Joel

		➤ 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.	<b>CLOSED</b>		Roxaneh
SP5	Do we need to compensate for TIS-B latency?	No additional compensation needed for ASSAP. The position is extrapolated to the time of transmission.	<b>CLOSED</b>	AI#19	
SP6	Are there any issues with receiving messages from multiple links for the same a/v (i.e., UAT and 1090)?	See ASSAP-WP08-09_ Issue SP6 Action Item 8-Dual Link Reception.ppt (Roxaneh)	<b>OPEN</b>	AI # 8	Roxaneh
SP7	Are there concerns with meeting ASA MASPS R3.210: Latency for the combination of ASSAP and the CDTI shall (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.	Open for modification from ASA MASPS. An issue paper is needed to change these thresholds if necessary.	<b>OPEN</b>	AI #9	Jonathan, Joel
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.	This needs clarification.	<b>OPEN</b>	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.	Seems reasonable.	<b>CLOSED</b>	AI #9	Jonathan, Joel
SP10	Are there concerns with meeting ASA MASPS p144: The maximum latency of the navigation data outputs to the ASA	Open for modification from ASA MASPS. An issue paper is needed to change these thresholds if necessary.	<b>OPEN</b>	AI #9	Jonathan, Joel Tom,

	system will be less than 2 seconds (ASA MASPS, Page 144)				Roxaneh
SP11	What level of validation is required?	Unresolved. Check into DO-249. Development and implementation planning guide for ADS-B applications.	<b>OPEN</b>	AI #20	
SP12	Define the Functional Architecture	Issue Paper: ASSAP Strawman Functional Architecture (Roxaneh)  The purpose of laying out the functional architecture and discussing the key functions that must be performed is to 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.	<b>CLOSED</b>		Roxaneh
SP13	What are the performance metrics for SP functions?		<b>OPEN</b>		Larry, Randy
SP15	Does NAC have to be extrapolated?	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.  Comment: Could this be tied to the usability requirement (R3.288 c)?  Joel: No, don’t extrapolate. NAC degradation is already included in the analyses.  Larry: Figure out what is adequate EVacq & what is adequate for ASSA for TIS-B? Update rate and NAC values. Larry will do this. Decided not to do this. Pilots are used to this.	<b>PROPOSE TO CLOSE</b>		Roxaneh
SP16	Is assignment of a unique track identifier required?	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	<b>CLOSE D</b>		Roxaneh

		<p>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. 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.” It could use flight ID.</p>			
SP17	Are the ADS-B reports that are processed by ASSAP “pre-filtered” or “raw measurements?”	<p>Excerpts from “GPS User Equipment Introduction”:</p> <p>“A GPS receiver measures pseudorange 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.”</p>	<b>CLOSED</b>		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.	<b>OPEN TIED TO AI (RANDY)</b>		Roxaneh/ Randy
<b>APPLICATION PROCESSING</b>					
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.	<b>OPEN PENDING PROGRAM OFFICE DIRECTION</b>		
AP2	If ANSD is determined by the system	Appendix D: “Initially the pilot or system will change the			

	based on phase of flight, how is it done?	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? Not an issue. ASSAP will have this as an input. <b>Dan:</b> What should it be based on m e.g., phase of flight, guidelines should appear in appendix, even if it is just a table of recommended ANSD. Included in CD application.			
AP3	How can the NIC values be scaled to correspond to SIL values that differ from those specified in the ASA MASPS?	<p>1) Require that SIL, NIC, NACP, and NACV each independently meet the requirements for the active applications as stated in the ASA MASPS</p> <ul style="list-style-type: none"> <li>– This is the current baseline and way that the ASA MASPS is written.</li> </ul> <p>2) Establish NIC scaling factors based upon SIL that will be appropriate for all possible sources of position data.</p> <ul style="list-style-type: none"> <li>– Concerned about the level of difficulty validating the scaling for all possible data sources. Concerned that the only answer is “no scaling” because of the potential for a “hypothetical” system.</li> </ul> <p>3) <u>If</u> the SC-186 community wants to maximize application availability of the received traffic information, then rather than scaling the received quality as identified in alternative #2, I propose the following</p> <p>Write the Surveillance Application Requirements based upon received traffic information</p> <ul style="list-style-type: none"> <li>• For example, traffic quality is sufficient application (A1) when any of the following are valid: <ul style="list-style-type: none"> <li>○ When SIL = 0, quality is insufficient</li> <li>○ When SIL = 1, NIC &gt;= X1, NACP &gt;= Y1, NACV &gt;= Z1</li> <li>○ When SIL = 2, NIC &gt;= X2, NACP &gt;= Y2, NACV &gt;= Z2</li> <li>○ When SIL = 3, NIC &gt;= X3, NACP &gt;= Y3, NACV &gt;= Z3</li> </ul> </li> <li>• Advantage: Keeps the problem in the surveillance community to make reasonable assumptions about application needs versus the reported quality. <ul style="list-style-type: none"> <li>○ Many of the surveillance application requirements are based upon good engineering judgment, especially the initial situational awareness applications.</li> </ul> </li> <li>• Concern is the delay in re-evaluating the application</li> </ul>	<b>CLOSED</b>	AI#31	Joel

		requirements in the ASA MASPS.			
AP4	Determine the availability of 1 NM HPL for existing TSO C129 sensors	<p>Legacy C129 transponders are typically certified to 10-5. Validate a way to scale containment radius from 10-5 integrity to 10-2. This can buy availability back. Alternatively validate a containment radius at 10-5 required for EVAcq.</p> <ul style="list-style-type: none"> <li>• Enhanced Visual Acquisition Requirements <ul style="list-style-type: none"> <li>– Target Integrity <ul style="list-style-type: none"> <li>◆ <math>NIC \geq 5</math>, <math>R_c &lt; 1 \text{ Nm}</math> (1852m)</li> <li>◆ Integrity Containment Risk 10-2/hr</li> </ul> </li> </ul> </li> <li>• Risk Associated with DO-260 Equipment <ul style="list-style-type: none"> <li>– From the fault tree <ul style="list-style-type: none"> <li>◆ Risk (Undetected Error <math>&gt; 1.0 \text{ Nm}</math>) = <math>2.15e-5/hr</math></li> </ul> </li> </ul> </li> <li>• Enhanced Visual Acquisition Requirements are met by DO-260 installations <ul style="list-style-type: none"> <li>– At least for Honeywell Equipment</li> <li>– Other vendors should look into their risk</li> </ul> </li> <li>• Need to Validate a method for scaling <math>R_c</math> Requirements for Availability</li> </ul>	<b>CLOSED</b>	AI#29	Don
AP5	Provide some preliminary NIC/NAC/SIL threshold values for the initial 5 ASA applications based on Joel's proposed alternative 3 of issue AP3.	<ul style="list-style-type: none"> <li>• Legacy C129 transponders are certified to 10-5 and cannot achieve a SIL of 3.</li> <li>• Perform ADS-B availability studies in regards to NIC and SIL.</li> <li>• Joel will provide some preliminary NIC/NAC/SIL threshold values for the initial 5 ASA applications based on his proposed alternative 3.</li> </ul>	<b>OPEN</b>	AI #47	Joel
AP6	Tracking of surface traffic may have issues when velocity is below 50Kts. The ASA Apps have requirements for velocity to be accurate (3m/s for ASSA & FAROA	Careful what we require for velocity requirements for surface traffic. Need clarifying. (Depends on source.)	<b>OPEN</b>		Don/ Jonathan
AP7	Discuss SBS Essential Spec requirements on TIS-B NIC/SIL/NACv set to zero along with ASSA application requirements from ASA MASPS Table 2-3.				

AP8	<p>Geometric vs. Pressure Altitude:  When traffic info contains suspect (or no) pressure alt, can the CDTI provide target alt relative to ownship geo in a way that is transparent to the pilot (i.e., on a target-by-target case provide pressure-pressure when avail and geo-geo when not avail)?</p>				
AP9	<p>The current GPS sensors do not output a 95% uncertainty figure of merit for horizontal velocity (future WAAS GSPS sensor may optionally provide this). STP has requirements to derive a HEVU, VEVU which are 95% uncertainty estimates based on source, which are encoded into NACv prior to transmission. However, the NACv and NUCr are typically set to unknown (i.e., 0) in existing equipments. How should ASSAP handle these cases? How will this affect the availability of applications that require a min NACv?</p>	<p>Joel's recommendation: If velocity is indicated as valid, use velocity to latency compensate the position (i.e., extrapolate) regardless of NACv.</p> <p>Need to further think though what this will mean for the availability for applications that require a min NACv.</p>			