

ASSAP MOPS Group Meeting Minutes #2

DAY 1:

The ASSAP MOPS group meeting, on 14 June 2006, started at 9:10 AM (Eastern Time). Roxaneh, chairman, started the meeting with introductions and reviewing the proposed agenda.

The attendees included the following on the first day:

Last Name	First Name	Organization
Chamlou	Roxaneh	MITRE/CAASD
Eich	Tom	ACSS
Manning	Robert	L-3 GSI (support USAF)
Walker	Don	Honeywell
Wichgers	Joel	Rockwell Collins
Brandao	Ruy	Honeywell
Theford	Bill	USAF
Samanant	Paul	Honeywell
Branch	Allen	FAA
Bachman	Larry	APL

1. Agenda addition: Ruy requested a discussion regarding how ASSAP will/should handle both DO-260 and D-260A reports.
2. Follow-on telecons and group meetings:
 - a. Next telecon scheduled for July 27, 3-4 EST.
 - b. Next group meeting scheduled for August 22-24. Tentatively scheduled at Boeing in Seattle to coincide with CDTI MOPS; one day joint meeting. Two rooms have been reserved, one for CDTI and the other for ASSAP. In the future, the ASSAP group plans to rotate the group meetings between RTCA headquarters and some other location.
 - c. September telecon (time TBD).
 - d. October group meeting (date TBD). Tentatively at RTCA headquarters in Washington, DC.
 - e. December group meeting (date/place TBD). Tentatively in Phoenix hosted either by Honeywell or ACSS.
 - f. Prefer that the October and December meetings do not conflict with 209 or other industry meetings.
3. Reviewed Issue Item #1, AI#14 regarding which applications are included in the initial version of the ASSAP MOPS. The program committee has determined that the first 5 applications have to be considered in the first version of the ASSAP MOPS. Don Walker mentioned that Honeywell is interested in In-trail procedure to be considered. Ruy mentioned that the CD application may be lower priority. The group agreed to focus on the first 5 applications and consider other

- applications such as the advanced applications once they are further defined.
Issue Item #1, AI#14 Status: CLOSED.
4. Reviewed Issue Item #2, AI#7 regarding if TQL is required in the initial version of the ASSAP MOPS. Currently, the 1090 MOPS DO-260A has not defined this parameter. The basic and intermediate applications (first 5) can use actual data quality parameters (Reference: ASA MASPS, Table AE-2); therefore TQL is not required. We agree that TQL is not required until we address the advanced applications. It was recommended that a note be added in the ASSAP MOPS regarding not requiring TQL. Issue Item #2, AI#7 Status: CLOSED.
 5. Reviewed Issue Item #3, AI#7 regarding if ACL is required in the initial version of the ASSAP MOPS. Same as TQL as described in previous item. Issue Item #3, AI#7 Status: CLOSED.
 6. Reviewed Issue Item #4 regarding if control panel / pilot inputs have to be addressed in ASSAP. Figure 2.6 in the ASA MASPS shows that all the flight crew interfaces are part of the CDTI interface. Not an ASSAP issue. Issue Item #4 Status: CLOSED.
 7. Reviewed Issue Item #5, AI#1 regarding if database inputs such as surface map databases need to be addressed in ASSAP. The airport surface map for the ASSA and FAROA applications are external to the ASA system boundaries defined in the MASPS. Database requirements are covered in other documents, e.g., DO-272. **Action Item Update (Bill Thedford):** Bill volunteered to verify if ASSAP has to consider database (airport map, etc.) input requirements for ASSA and FAROA. Issue Item #5, AI#1 Status: OPEN.
 8. Reviewed Issue Item #8, AI#17 regarding on how to handle if two or more aircraft have the same address. The following action items were assigned to assess the probability and safety implications of this issue. For now, ASSAP will assume that all addresses are unique. Issue Item #8, AI#17 Status: OPEN.
 - a. **Action Item (Bill Thedford):** Bill to provide some probability estimates regarding two or more aircraft having the same address in the same vicinity.
 - b. **Action Item (Roxaneh):** Roxaneh will contact Stu to see if the RFG group has performed a risk assessment for EVA/VSA regarding displaying or not displaying a target such as when two or more aircraft have the same address.
 - c. **Action Item (Allen Branch):** Alan has the action to determine if the FAA has an opinion regarding the severity of not displaying a target for EVA.
 9. Reviewed Issue Item #12 regarding how TIS-B/ADS-B/TCAS tracks are correlated? It was mentioned that using addresses alone between ADS-B and TCAS is not sufficient due to the previous issue regarding the case if two or more

aircraft have the same address. Spatial correlation was proposed to solve this problem. This issue will be decided based on the results of Issue Item #8, AI#17. For now, ASSAP will assume that all addresses are unique therefore using addresses alone for correlating ADS-B and TCAS tracks are sufficient. Note: Spatial correlation 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 an ADS-B transmitter is installed on an aircraft with an ATRCBS only transponder (no address available from the TCAS track). Issue Item #12: OPEN.

10. Reviewed AI #4 regarding the minimum number of traffic to send to the CDTI. Tom Eich provided a presentation (ACSSASSAPMOPSAI4.ppt) suggesting a total minimum number of 60 with a minimum requirement for 30 surface and 30 airborne targets. There was general consensus that 60 is a good starting point. Rationale was taken from Service Volumes for various applications including TCAS and ADS-B applications from DO-289. AI#4 Status: CLOSED.
11. Reviewed AI #3,13 regarding tracking capacity. Tom Eich provided a presentation (ACSSASSAPMOPSAI3_13). AI #3,13 Status: OPEN.
 - a. Discussed rationale for required service volume based on the initial applications. Tom Eich stated that the CD application requires 45 Nm, +/- 15,600 ft per the ASA MASPS. Based on 257 airborne traffic within 50NM from the LA2020 scenario, suggest that the required minimum number of traffic to track is about 300 which includes a minimum of 30 surface targets to satisfy the ASSA and FAROA applications. Don Walker proposed that there may be a reduced set of requirements based on aircraft performance. Ruy mentioned if CD was really necessary to consider for the initial version of the ASSAP MOPS. Tom stated that the next most stringent application is EVA which we are considering requires tracking a minimum number of 60 targets, (min 30 airborne, min 30 surface; reference AI#4 above).
 - b. **Action Item (All):** In general, everyone should read the ASA applications (DO-289) to provide related input to the development of the ASSAP MOPS. Roxaneh suggested starting with the CD and EVA applications. Due next group meeting (2 months).
 - c. **Action Item (Roxaneh):** Roxaneh has the action to provide the authors of the ASSAP applications in DO-289 as a resource to questions. AI#26 was created and CLOSED.
 - d. **Action Item (Larry Bachman):** Larry Bachman to provide the number and types of traffic in the LA2020 scenario within 12 Nmi and +-4000 ft. These numbers are inflated from the EVA numbers in DO-289. This information will help validate how many airborne vehicles ASSAP will have to monitor and track. Knowing the types of traffic may lower the minimum tracking capacity.

- e. **Action Item (Alan Branch):** Alan took an action to see if there is a plan for equipage of surface vehicles. This information will help validate how many ground vehicles ASSAP will have to monitor and track.
12. Reviewed AI#5 regarding ADS-B/TCAS track selection for the display and applications. Tom Eich provided a presentation (ACSSASSAPMOPSAI5). All agreed that when integrated with a TCAS system, you need to verify that the ADS-B track does not compromise the intended safety of the TCAS system. A spatial window check was proposed between a correlated ADS-B and TCAS track and if the check fails then the ADS-B track is replaced with the TCAS track on the display. More discussion is needed on this issue. AI#5 Status: OPEN.
- Tom proposed +-45 degrees bearing, 0.5 Nm Relative Range window for correlation. These values are based on satisfying basic visual aid from TCAS experience.
 - Action Item (Don Walker):** Don volunteered to determine the availability of 1 Nm HPL for existing TSO-C129 sensors.
13. **Action Item (Roxaneh):** Present overall architecture at the next telecon since many of the attendees was not present at the first group meeting.
14. Schedule Review:
- Very aggressive to meet October for resolving all issues.
 - Bob Walker suggests focusing on one application such as the EV Aq to get a better understanding of the effort required.
 - May consider writing the requirements for EV Aq first then determine a schedule for completing the other 4 applications. Will discuss a target date tomorrow.

DAY 2:

The ASSAP MOPS group meeting, on 15 June 2006, started at 9:07 AM (Eastern Time). Roxaneh, chairman, started the meeting with introductions and reviewing the proposed agenda.

The attendees included the following on the second day:

Last Name	First Name	Organization
Chamlou	Roxaneh	MITRE/CAASD
Eich	Tom	ACSS
Manning	Robert	L-3 GSI (support USAF)
Walker	Don	Honeywell
Wichgers	Joel	Rockwell Collins
Brandao	Ruy	Honeywell
Theford	Bill	USAF
Samanant	Paul	Honeywell
Branch	Allen	FAA
Pagano	Tom	FAA
Weeldreyer	Jeff	?

Thomas	David	L-3 Titan
Saffel	Bob	Rockwell Collins
Grappel	Robert	MIT/LL

1. Agenda addition: Tom Pagano requested a discussion on accepting DO-260 for ASSAP.
2. Reviewed AI#6 regarding Best Track Source Selection Logic presented by Joel Wichgers (reference Wichgers_Strawman_Track_Selection_Logic_2006-05-16.ppt). AI#6 Status: CLOSED
 - a. Tom Pagano asked to clarify if best track is based on tracks or reports. Best track selection is based on tracks that have already been established and correlated.
 - b. **Action Item (Joel Wichgers):** Propose a way to scale the NIC based on the integrity containment risk (SIL). Due at the next group meeting (2 months).
 - c. Joel proposes to not use a Kalman filter to weight information from two or more tracks. Use the integrity and accuracy data coming directly from the datalink.
 - d. Larry questioned when this will be checked. Propose some hysteresis like 10 sec.
 - e. This same algorithm can also be used for TIS-B to TIS-B selection.
 - f. The general consensus of the group is that this is a good start and will have to be further analyzed when the applications are addressed.
3. Robert presented a paper regarding duplicate addresses (referenceTime Registration.doc and BSGS16-WP03- Dup Address Alg-2 copy.pdf).
 - a. Algorithm testing was performed using actual measured data from general aviation aircraft. Bob S. mentioned that Velocity is very jumpy and may cause a problem.
 - b. Jeff asked what the bit error probability is. Robert said that the probability is 10^{-7} – 10^{-6} .
 - c. Duplicate addresses have occurred on commercial aircraft recorded at Dallas airport.
 - d. 260A issue: Concern about this algorithm will not work post CPR decoding. Odd and Even messages from different aircraft may also cause an issue.
 - e. This is a big problem in 1090 since the data are in different messages. UAT is less than a problem since all the data is in the same message.
 - f. Roxaneh will address the duplicate address issue at the Plenary meeting. This issue has to be address by more than the ASSAP group (260A, etc.).
 - g. ASSAP currently will assume that all addresses are unique until this issue is resolved.
4. Discussed if DO-260 is acceptable for ASSAP.

- a. FAA is going forward with DO-260A but currently the majority of the ADS-B out is DO-260 today. If we don't consider DO-260 then many applications may not work.
 - b. Table AE-2 in the ASA MASPS says that DO-260 is compatible for the ASA applications. There is also a table that translates NUC to an equivalent SIL, NAC and NIC. Analysis has been done for these applications in the appendix.
 - c. As we develop the requirements, we need to be aware if there are any limitations using DO-260.
 - d. Since this has been addressed in the ASA MASPS, no additional analysis is needed regarding the use of DO-260.
5. Reviewed AI#9 regarding issues with the timing requirements in the ASA MASPS. AI#9 Status: CLOSED
- a. R3.210 in the ASA MASPS defining 400ms latency for the 10 highest priority traffic seems too stringent of a requirement. 400ms is open for modification in the ASA MASPS. The latency for all other traffic is defined as 1 second. ARINC735A transmits the DTIF at 1 second which already introduces more than 1 second of latency. The total latency is greater than 1 second when you include CDTI processing and ASSAP latency. An issue paper is needed to change these values since they are shall requirements in the ASA MASPS.
 - b. (R3.187) ASSAP shall 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...
6. Jonathan Hammer provided the authors of the ASA MASPS. AI#26 Status: CLOSED.
- a. Randy Bone and Bob Hilb were the main attendees of the working group.
 - b. EV Acquisition, EV Approach – Dave Spencer (Lincoln Labs)
 - c. ASSA and FAROA – Joel W.
 - d. CD – Lee Etnyre, Wang
7. Discussed which issues are CDTI related. These issues will be discussed at the CDTI / ASSAP coordination meeting.
- a. Does the CDTI group have a latency requirement from F to G?
 - b. Who will perform display filtering?
 - c. The CDTI group should provide a technical status and issue report related to ASSAP.
 - d. What controls are they sending to us for CD and approach?
8. Reviewed the ASSAP outline. Decided to remove the section for ACL since it will not be defined in the first release of the ASSAP MOPS.

9. Comment: Velocity reports may be as important as position reports. ASSAP will have to consider that the reports from a 260A transmitter may have different data ages for velocity and position reports.
10. Comment: Someone suggested that the proposed MITRE degenerate Kalman filters are not requirements but a recommended design defined in the ASAP MOPS appendix. The ASSAP MOPS should only define performance requirements.
11. **Action Item (Ruy Brandao):** Check the ASA MASPS safety analysis for not displaying a track. This information will help understand the case of not displaying a track when duplicate addresses exist.
12. Meeting completed at 5PM.