ASSAP MOPS Group Meeting Minutes #4

The attendees included the following:

Last Name	First Name	Organization
Bachman	Larry	JHU/APL
Branch	Allen	FAA/AIR-CERT
Furr	Gary	L-3/Titan – FAA TC
Chamlou	Roxaneh	MITRE/CAASD
Eich	Tom	ACSS
Eftekari	Robert	MITRE/CAASD
Ramdeen	Steve	FAA/AIR-130
Shay	Rick	NASA LARC
Sleight	Randy	FAA/JHU APL
Swider	Christopher	FAA/AIR-130
Swaine	Robert	FAA/AOV 310 (ICAO Separation and Airspace Safety Panel)
Thomas	Dave	L-3 TITAN – FAA TC
Walker	Don	Honeywell
Wichgers	Joel	Rockwell Collins

DAY 1:

The ASSAP MOPS group meeting, on 07 November 2006, started at 9:10 AM (Eastern Time). Roxaneh, chairman, started the meeting with introductions and reviewing the proposed agenda.

1. Roxaneh received Don Walker's (Honeywell) presentations and they were added to the meeting agenda. The proposed agenda was accepted. Also the last group meeting and telecon minutes were accepted as is.

2. Follow-on ASSAP telecons and group meetings are scheduled as follows:
    a. The next telecon is scheduled for Monday, December 11, 2-4 EST.
    b. The next group meetings are scheduled as follows:
        1. January 9-12, 2006 in Phoenix, Arizona (located at either ACSS or Honeywell)
        2. March 27-29, 2006 at RTCA headquarters (located in Washington, DC)
        3. June 5-8, 2006 at Rockwell Collins (located in Cedar Rapids, Iowa; TBC)

3. The review of the ASSAP MOPS schedule was led by Roxaneh (Reference ASSAP-WP08-05):
    a. All functional and performance requirements are scheduled to be completed by 6/29/07.
    b. Coordination activities with the CDTI group are scheduled up until 6/1/07.
    c. The first draft of the ASSAP MOPS is scheduled to be completed by 11/12/07.
    d. The Plenary meeting for the ASSAP MOPS document is scheduled for 2/1/08.

e. The schedule assumes that tests are developed in parallel with the requirements. This may be difficult as some of the requirements will not be mature. Early tests activities will help identify problems with the requirements.
f. The rationale behind the scheduled March '08 completion date of the ASSAP MOPS is based on aligning up with associated TSOs scheduled around the same time frame.
g. The ASSAP MOPS schedule was accepted as is.

4. The ASSAP MOPS Writing Assignment Discussion was led by Roxaneh (Reference ASSAP-WP08-04_Writing Responsibility.doc and ASSAP-WP08-05-ASAS MOPS_10_17_06.doc). The ASSAP MOPS outline was used to assign writing responsibilities as follow:
    a. The Performance Requirements of the Equipment, Section 2.2.2 contains system latency requirements that may require possible modifications to the values currently defined in the ASA MASPS. White papers must be written for any deviations from the ASA MASPS. This section was assigned to APL.
    b. The Functional Requirements were assigned as follows:
        1. Input/Output, Section 2.2.3.1 was assigned to Tom Eich (ACSS).
        2. Surveillance Processing, Section 2.2.3.2 was assigned to APL and MITRE.
        3. **Action Item #63 (Tom Eich, ACSS; due 12/11/06)**: Regarding ASSAP MOPS writing assignments. Identify which sections of the Application Processing General Requirements will be assigned to ACSS. Remaining sections will need assignees.
        4. Application Processing sections for EV Acquisition and ASSA/FAROA were assigned to Don Walker (Honeywell).
        5. Application Processing sections for CD and EV Approach were assigned to MITRE.
    c. The ASSAP Equipment Performance sections should be similar to the requirements in the Link MOPS which includes requirements such as EMI, performance, and pin injection.
    d. The Assumptions, Section 1.6 was assigned to Don Walker and Ruy Brandao (Honeywell).
    e. Everyone should begin writing their assigned ASSAP MOPS sections. The issues list and action item list should be referred too. Any deviations from the ASA MOPS will require issue papers and concurrence from the ASSAP group.

5. Review of the Issues List was led by Roxaneh (Reference issues list ASSAP-WP08-08):
    a. Issue S5 – Does ASSAP have to address any requirements for the airport map database? The ASSA and FAROA applications do not have requirements for any alerting which would require airport map attributes for alerting algorithms in ASSAP. The ASSA and FAROA applications

use the airport map for situational awareness on the CDTI. A comment will be written by Don Walker (Honeywell) to be included in the Assumptions section of the ASSAP MOPS. Issue S5 is closed.

b. Issue I2 is Open. Jonathan and Sethu will provide proposals at the next ASSAP/CDTI coordination meeting regarding application selection. Don Walker (Honeywell) brought up an issue if ground traffic should be considered degraded based on the EV Acquisition criteria instead of ASSA/FAROA criteria when no airport map is available. Based on the decision, the degraded criteria sent from ASSAP to the CDTI will have to be determined for these cases when an airport map is available or not.
c. **Action Item #64 (Tom Eich, ACSS; due Feb '07)**: Regarding I/O interfaces between ASSAP and CDTI. Coordinate and propose degraded traffic and qualified traffic interface requirements between ASSAP and the CDTI.
d. Issue I6 – Sending TCAS correlated tags with the traffic sent to the CDTI is an optional requirement for the CDTI. The next ASSAP/CDTI coordination meeting needs to address if this information is required to be sent from ASSAP to the CDTI.
e. Issue I8 – The program office made a decision to not define the TIS-B Service Indicator in the 1090 MOPS. Will it be in final UAT spec? It may have been taken out of the UAT spec. Issue I8 is open pending program office direction.
f. Issue SP1 – Traffic with duplicate addresses poses a problem with 1090 ES because the squitter data is not all sent in the same report; odd and even CPR encoded positions are also sent in different reports. This issue cannot be solved in ASSAP surveillance. It may be possible with UAT reports because all the squitter data is sent in the same report. Since not displaying a target is consider minor and duplicate addresses in the same surveillance vicinity is a rare corner case, ASSAP will require as a minimum that the closest track must be tracked for UAT duplicate address situations only. Issue SP1 is closed.
g. Issue SP5 is closed. GPS position is extrapolated to the time of transmission. No additional compensation or position filtering is needed in the ASSAP surveillance tracking function.
h. Issue SP15 - Joel Wichgers (Rockwell Collins) highly suggested not extrapolating NACp. The intent of the ASA MASPS was not to extrapolate NACp. The group will not make this as a requirement in the MOPS. The ASSA and FAROA applications defined in the ASSA MASPS contain background information on how the quality, integrity, and track coasting thresholds were determined for degrading and dropping traffic. The ASSAP group should review this background information to determine if any issues or clarifications exist.

6. MITRE's Simulation Capability and Overview was presented by Roxaneh and Robert Eftekari (Reference presentation ASSAP-WP08-15): The simulation will provide guidance material for the ASSAP MOPS and help validate the

performance metrics. Robert ran two demos with traffic along the east coast and in Arizona with Embry-Riddle aircraft UAT equipped.

DAY 2:

The ASSAP MOPS group meeting, on 08 November 2006, started at 9:10 AM (Eastern Time). Roxaneh, chairman, started the meeting reviewing the proposed agenda.

1. The proposed agenda was accepted.

2. Roxaneh summarized the ASSAP MOPS writing assignments from Day 1.

3. The ASSAP group discussed about the scope of the interface definition between the CDTI and ASSAP. The goal is to only include functional requirements and latencies since various architectures can be implemented.

4. Issue SP2: ASSAP tracking capacity was presented by Randy Sleight, JHU/APL (Reference presentation ASSAP-WP08-12).
    a. **Action Item #3 (APL):** Regarding tracking capacity requirements. A minimum tracking of 120 targets from Randy's presentation (ASSAP-WP08-12) is suggested. Performance requirements are also needed on which 120 targets have to be tracked. For example: ASSAP shall track a minimum of the most relevant 120 targets. More performance requirements should be considered.
    b. **Action Item #65 (APL)**: Randy's presentation (ASSAP-WP08-12) determined that the CD application's altitude coverage volume should be +/-20,600 ft instead of +/-15,600 ft as defined in the ASA MASPS. APL will verify how the ASA MASPS determined the coverage to be +/-15,600ft. Changing the requirement from the ASA MASPS needs to be considered. If so, then a white paper is required to deviate from the ASA MASPS requirements.

5. Issue #S7: Display differences in traffic info between CDTI and ATC was presented by Roxaneh, MITRE (Reference presentation ASSAP-WP08-10).
    a. This presentation will be presented at the next CDTI/ASSAP coordination meeting.

6. Issue AP#5, AI #47: Preliminary NIC/NAC/SIL threshold values for the initial 5 applications based on alternative 3 of issue AP3 was presented by Joel Wichgers (Reference presentation ASSAP-WP08-22).
    a. **Action Item #66** (MITRE): Re-evaluate the velocity accuracy thresholds in the ASA MASPS for the CD application.
    b. **Action Item #67** (Don Walker): Re-evaluate the accuracy thresholds in the ASA MASPS for the ASSA and FAROA applications. Mainly regarding the velocity accuracy at speed less than 50kts.

7. Robert Eftekari presented a calculation of closure rate for the EV Approach application. A demo was also presented showing a coupled target with a simulation of its closure rate. (Reference presentation ASSAP-WP08-13).
    a. Their demo displays slant range in the data block and calculates closure rate based on change of slant range. The ASA MASPS requires ASSAP to send horizontal range to the CDTI. Tom Eich mentioned to MITRE that they may want to consider displaying horizontal range in the data block along with calculating closure rate using only the horizontal components.

8. AI#39, TCAS Tracking Performance was presented by Don Walker (Reference presentation ASSAP-WP08-25).
    a. During Don's presentation regarding how TCAS prioritizes its tracks sent to the display, every one accepted Tom Eich's current proposal for ASSAP track priority (RAs, TAs, ASA App Alerts, Coupled Traffic, Selected Traffic, then those closest in range). This priority scheme will have to be evaluated for each application.

9. Robert Eftekari presented some UAT ADS-B NACp Variations from Recorded Data (Reference presentation ASSAP-WP08-14). The data indicated that the majority of UAT ADS-B equipped aircraft had a NACp of 6.

10. Issue SP#6. AI #8: Dual Link Reception was presented by Roxaneh (Reference presentation ASSAP-WP08-09).
    a. **Action Item #68 (Roxaneh, MITRE):** UAT TIS-B and UAT ADS-R reports are not distinguishable. An issue paper should be written to address this problem in the UAT Link MOPS.
    b. Conclusion – It should not be a problem for ASSAP to receive tracks via dual links. May consider fusing or selecting the best track.

11. AI #49: Overview of Position Accuracy Studies was presented by Randy Sleight, JHU/APL (Reference presentation ASSAP-WP08-17).
    a. For 1090 ES, changes in velocity seemed to cause jumps in accuracy.
    b. For UAT ERAU aircraft, steep drops and turns seemed to set NIC to 0.

12. New Issue - Geometric/Pressure Altitude discussion: When traffic info contains suspect (or no) pressure altitude, can the CDTI provide target altitude relative to ownship geometric altitude that is transparent to the pilot (i.e., on a target-by-target case provide pressure-pressure when available and geo-geo when not available)? The ASSP WG agreed to make provision for this and will bring this up with the CDTI WG at our next joint meeting (see item 15 c). ASSAP tracking must be cautious in its use of either geometric or pressure altitude. Also geometric altitude can be in either form of HAE or MSL. UAT sends both pressure altitude and HAE geometric altitude. 1090 ES sends pressure altitude and difference between HAE geometric and pressure altitude in-order to save bits in the messages. Per Arinc 743A-4 regarding GPS data, Label 370 is HAE geometric altitude and Label 076 is MSL geometric altitude.

13. Updated Discussion on CD Application led by Ganghuai Wang, MITRE (Reference presentation ASSAP-WP08-11).
    a. Typo identified during the last group meeting has been fixed. AI#34 can be closed.

14. AI #36: The ASSAP group request that other transponder manufacturers explain how NUCp is encoded on their current transponders. (Don W., Tom E., Joel). Reference presentation ASSAP-WP08-20, ASSAP-08-21, and ASSAP-08-23. AI #36 can be closed. Don's presentation suggested using NIC values for degrading EV Acquisition traffic which was used for the Capstone project. The group removed this suggestion from the presentation since it does not match the degrading requirements for the EV Acquisition application defined in the ASA MASPS.

15. AI # 55, Develop a white paper to justify deviation from Table 3-21 requiring display range / map scale and display orientation. Additionally, check validity of other parameters in Table 3-21. Some of the parameters may be optional. (Presented by Tom Eich, ACSS). Reference presentation ASSAP-WP08-16.
    a. Display Range / Map Scale; Display Orientation / True; and Display Orientation Mag should be considered optional since the CDTI can receive this information externally.
    b. Removing "Call Sign" was agreed. Flight ID is what should be used.
    c. **Action Item #69 (Tom Eich, ACSS):** Traffic Geometric Altitude: How will the CDTI use geometric altitude? Relative altitude may be acceptable but converting it to pressure altitude may be an issue for the ABSOLUTE value on the target. The ASSAP group has decided that this is optional as a second source but needs to be discussed further with the CDTI group. Displaying traffic with an absolute value of GEO may be an issue. Delta (relative) GEO is ok but should be indicated.
    d. Quality of Traffic Directionality – How do you calculate quality of traffic directionality? May be based on velocity accuracy and speed. A minimum requirement needs to be considered.
    e. New proposed parameter - Traffic Vertical Sense: May be a requirement for TCAS correlated traffic. Propose that this is optional for ADS-B and TIS-B only traffic.
    f. New proposed parameter - Traffic Ground Status. This may be optional.
    g. New proposed parameter - Traffic type. Also need to consider ADS-R.

16. AI #56: Own-ship information to the CDTI is missing in Table 3-21 of the ASA MASPS such as lat/lon, ground speed, etc. Review the data from the STP document and propose parameters to be sent to the CDTI. (Presented by Tom Eich / ACSS). Reference presentation ASSAP-WP08-16:
    a. New proposed parameter - Own-ship Track Angle or Heading for calculating traffic directionality.

b. New proposed parameter - Own-ship Position Quality should be required for ASSA and FAROA. May also be required for the other applications. Further discussion is needed with the CDTI group.
c. New proposed parameter - Own-ship Length / Width should be optional for ASSA and FAROA.

DAY 3:

The ASSAP MOPS group meeting, on 09 November 2006, started at 1:10 PM (Eastern Time). Roxaneh, chairman, started the meeting reviewing the proposed agenda.

1. The proposed agenda was accepted as is.

2. The group reviewed the action item log and updated the assignee and due date fields.

3. Roxaneh will contact Rick Shay about AI#10 (Determine NASA involvement and/or availability related to the validation of requirements.) which was assigned to him without his presence.

4. Joel provided some information about heading quality from inertial sources. Joel said that heading accuracy from an inertial source should be within a 10^{th} of a degree. AHRS systems can be more inaccurate. Velocities may be a concern at low speeds.

5. Discuss SBS Essential Spec requirements on TIS-B NIC/SIL/NACv along with ASSA application requirements from ASA MASPS Table 2-3.
    d. This document says that TIS-B service will always set the NIC, NACv, and SIL to zero. Only NACp is required.
    e. Having a NIC and SIL of zero may be ok for the EV Acquisition application but will cause ground traffic for ASSA and FAROA to always be degraded.

6. Reviewed the ASSAP MOPS outline for the application processing requirements. Roxaneh added a Common Application Processing Requirements section.

Meeting ended at 4:35PM