

Working Group 6  
 RTCA DO-242A ADS-B MASPS  
 Minutes of 10th Meeting held in Arlington VA.  
 December 10, 11, & 14, 2001

The attendees included:

Tom Foster, Rockwell Collins	Bill Flathers, AOPA	Robert Manning, AF/XOR-GANS
Stuart Searight, FAA / ACT-350	Steve Horvath, UPS-AT	James Maynard, UPS AT
Jerry Anderson, FAA / AIR-130	Bob Hilb, UPS	William Morris, Raytheon
Richard Barhydt, NASA Langley	Gary Livack, FAA / AFS-400	Ken Staub, Trios Assoc.
		Tony Warren, Boeing Air Traffic Mgmt.

**Monday, 10 December**

1. Introductory Remarks

- Tom Foster began the meeting by welcoming everybody to the Rockwell Collins offices. It was agreed that the primary goals of the week were to: 1) review and finalize the briefings for plenary later in the week; 2) consider some new inputs from Anchorage ATC and Mitre/CAASD; and 3) to then get back to working Issue Papers and Action Items.
- Tom also gave a review of the SC-186 leadership telecon that took place the previous night. It was agreed by participants of the telecon that better coordination is needed between the working groups on their work efforts and deliverable scheduling. It is probable that the steering committee will be reconstituted and regular such telecons will occur in the future. Paul Fontaine pledged SF-21 program office support to all SC-186 activities.

2. Review Agenda

- It was agreed that after reviewing the Intent briefing prepared by Tony and Richard the group will review 242A-WP-10-04 and 242A-WP-10-05 which document some new recommendations for ADS-B from Anchorage ATC and Mitre/CAASD. With that one addition, the agenda was accepted.

3. Review and Approve Minutes of Last Meeting

- Minutes from the last meeting were approved without comment.

4. Review of plenary briefing for Intent Material (242A-WP-10-09) [T. Warren, R. Barhydt]

- It was agreed to include which aspects of the Intent capabilities are to be linked to which ADS-B equipage classes.
- It was agreed to trim down the briefing to a high-level discussion on the reasons for needing to expand upon the DO-242 TCP definitions, a summary of the changes, and how they will be phased in. Examples will be left out of the briefing, but be available as needed to assist in the conversation.
- Tony and Richard will edit the presentation accordingly and the group will review it tomorrow.

5. Review of plenary briefing on NIC/NAC/SIL (242A-WP-10-07) [J. Maynard]
  - Jim's briefing that he gave to WG3 at their December meeting in London was modified to be more generic and high level for presentation to the plenary.
  
6. Review of ADS-B recommendations from Anchorage ATC and Mitre/CAASD (242A-WP-10-04, 242A-WP-10-05)
  - Capstone Program Comments (242A-WP-10-04):
    - IDENT: It is the plan of WG6 to address this issue in Revision A. Ken Staub reported he closed **AI 9-9** by coordinating with Rich Jennings on this issue. Ken also took an Action Item **[AI 10-1]** to author an Issue Paper on this topic.
    - Identify flights under ATC control: An action was given to Bill Flathers **[AI 10-2]** to write an issue paper on this topic. It is the plan of WG6 to address this issue in Revision A as well.
    - Altitude Off: ADS-B altitude sources will have higher integrity than older sources and ADS-B systems have the ability to flag bad altitude source. Therefore, WG6 feels the Altitude Off ability is probably not needed for ADS-B unless there are other operational uses of turning altitude off. *(After discussion at plenary later in the week, WG6 position was changed on this topic and an Issue Paper will be written by Jim Maynard **[AI 10-06]**.)*
  - Mitre/CAASD Comments (242A-WP-10-05)
    - ADS-B Air-ground Requirements: Tony Warren felt that this request is out of scope of the ADS-B MASPS. It was agreed that the WG6 position will be that WG6 has no data to base a change in Revision A on these concerns. WG6 feels that analysis and data need to be provided and that this can be examined as part of a later revision on the MASPS. If analysis is provided at a future date, it should also be shown why this requirement should be an ADS-B requirement and not a ground display requirement.
    - User Population Requirements: WG6 feels that this is a link validation issue, and should not be placed in the MASPS. *(After some off-line discussion with between Tom, Tony, and Stan Jones, it was agreed to have an Issue Paper written on this topic and that it be considered for Revision A.)*
    - Update Intervals: WG6 was not sure what was asked for on this point. It will be asked of the authors if the resolution of IP35 and the elimination of Note 7 satisfies their concerns, or if they are asking for something else.
    - Emulation of Transponder Functionality: This is addressed in 242A-WP-10-04 above.
    - Intent Information: WG6 feels this idea is consistent with its current recommendations.
    - Addresses and Identification: This topic is possibly addressed by the address qualifier which is current proposed in Jim Maynard's SV and MS reorganization papers.

## Tuesday, 11 December

7. Review of plenary briefing on State Vector and Mode Status reorganization recommendations (242A-WP-10-08) [J. Maynard]
  - ASA MASPS Coordination Issue: It is difficult to establish the criticality for ADS-B to transmit items such as CDTI capable or TCAS operational, since the importance of a failure of this data is determined by the applications being run by the receiving aircraft. This overall criticality level

needs to be addressed by WG4. “Any discrete information that is critical for an application is assumed to be addressed by reported service levels of the transmitting aircraft and validated by WG4.”

- Jerry Anderson questioned how the SV and MS report changes would effect the requirements put forth in Table 3-4. After some discussion, it was agreed the following question needs to be answered: What are the required update rates and coast intervals for any new report elements within DO-242A.

#### 8. Review of plenary briefing on WG6 status and MASPS Changes overview (242A-WP-10-06) [T. Foster]

- The group reviewed Tom’s briefing. After a few minor changes per that review, the presentation was deemed ready for plenary.

#### 9. Open Intent Issues

- Definition of Intent capability levels {AI 8-5} [T. Warren]
  - This item is closed with the final draft of the Intent White Paper (242A-WP-10-03)
- WP section 3.4.3.5 TBDs {AI 8-8} [R. Barhydt]
  - [AI 10-3] This material will be worked by Richard and given to Jim for incorporation into his next draft of the SV, MS, and OC Report Reorganization.
- Conditions for re-issue of TCR {AI 9-12} [T. Warren]
  - The status of this AI is dependant upon plenary decisions regarding A3 aircraft.
- Short-Term Intent text re-write {AI 9-13} R. Barhydt]
  - Richard provided some draft text for Target Altitude, Target Heading, and Target Track. (242A-WP-10-10) that was reviewed.
  - A lengthy discussion followed on how target altitude will be interpreted and used by pilots and applications.
    - It was agreed to reserve a bit for Target Altitude Type in the Target State Report.
  - [AI 10-4] Jim will incorporate the submitted material from Richard (242A-WP-10-10) into his next draft of the SV, MS, and OC Report Reorganization (242A-WP-11-01)
  - It was agreed that a reserved bit for Target Altitude Type will also be needed in the Trajectory Change Report.

#### 10. Open NIC/NAC Issues

- SIL integrity definition {AI 8-7} [T. Foster, T. Warren]
  - It was agreed that this item was closed within 2242A-WP-9-01a
- HFOM, VFOM, EPU definitions {AI 8-6} [S. Searight]
  - EPU (DO-236a): A measure based on a defined scale in nautical miles or kilometers which conveys the current position estimation performance.
  - Position Estimation Error (DO-236a): The error difference between true position and estimated position.
  - Position Uncertainty (DO-236a): A measure that bounds the magnitude of an unknown position estimation error at a specific confidence level. A 95% position uncertainty of X can be either one-dimensional (indicating 95% probability true error is less than  $\pm x$  error) or two-dimensional (indicating a 95% probability true error is contained within a circle of radius X).

Note: This document only addresses the horizontal 95% radial position uncertainty and the horizontal 99.999% radial position uncertainty.

- HFOM (DO-236a): a measure of the accuracy of an aircraft's reported position. It is the radius of a circle, centered on an aircraft's reported position, such that the probability of the true position lying outside that circle is 5% or less. Redundant measurements are not needed to estimate HFOM; the HFOM computation assumes that everything is working as it should.
- Editing of MASPS NUC text {AI 6-4} [S. Searight]
  - It was agreed that this action item can not be completed until other areas of changed MASPS text are finalized.
- Accuracy of Note #3 on page 8 of 242A-WP-6-11 {AI 6-22} [T. Warren]
  - This action item is closed.
- Vertical NIC requirements (IP 39)
  - The group considered how this material should be addressed and edited into Jim's 242A-WP-11-01 draft. It was agreed to include a deferral of a 2-bit NAC<sub>baro</sub> (Barometric Altitude Quality Code) for section 2.1.2.15 and a 1-bit NIC<sub>baro</sub> (Altitude Cross-Checking Flag) for section 2.1.2.16.
  - This text will be the resolution for IP39 and close that Issue Paper.

#### 11. Definitions of Obstacles types and categories {AI 8-3}

- Gary Livack reported that Rudy Riana from RTCA will forward to Stuart the draft of the Airport Mapping document that is going to the PMC. [AI 10-9] Once Stuart receives the document, he will be able to pull the definitions and place them in the MASPS glossary.

### **Friday, 14 December**

12. Tom announced his early retirement from Rockwell, but that Rockwell will continue to support his activities with WG6.

13. Review of Responses from Plenary Briefings. *(The notes under this item are a combination of notes from plenary and the WG6 review and discussions from Friday morning.)*

#### A. WG6 overview briefing given to plenary by Tom Foster

- It was suggested from a Canadian Air Traffic Controller the air speed is needed in State Vector and is a required element for some ground-based ATC activities, ATN, and CPDLC build 2.
  - This was debated when WG6 reconvened with Tony feeling that Air Speed did not have to be broadcast at the rate of the SV even if Ground Speed is lost. Others felt that it was promised at plenary that we would keep it at the current rates, but would include this issue in our coordination list with WG4 by requesting them to examine under what conditions air speed might be able to be transmitted at lower rates.

- It was agreed that for DO-242A we have the OC-ARV report and a condition defined for when this is to be broadcast. It will need to be deferred to future revisions what other conditions might trigger the sending of this data and what different rates might be used for the various conditions.
  - Tony and Richard felt it was part of the TSR proposal to also send this data whenever a TSR is sending Target Heading instead of Target Track. It was agreed that this material will be referenced in the body as appendix material.
  - Richard's spreadsheets from 242A-WP-08-09 will be included in the appendix as justification for other conditions for OC-ARV.
- Note 7 of Table 3-4 (IP35): Though the group thought there was resolution to this IP, there is still some dissention among the principals. Apparently there is a recent suggestion from Steve Heppe that Bill Harman finds more acceptable than the latest proposed resolution. Stan Jones has also had some input on this topic within 242A-WP-10-05 regarding user population requirements. [AI 10-5] Stuart will facilitate another round of discussion on this topic with Stan Jones, Jonathan Hammer, Steve Heppe and Bill Harman. Stuart will also set up a telecon for the 3<sup>rd</sup> week in January at which it is hoped this can come to closure. [AI 10-6] Stuart will also request of Stan that his user population requirement proposal be placed into an Issue Paper.
- Capability Class Codes
    - Per plenary review CCs will need to be added for TSR and TCR capabilities.
- Capstone Inputs
    - [AI 10-1] Ken Staub will write a formal Issue Paper for the IDENT request and propose MASPS language.
    - [AI 10-2] Bill Flathers will write an Issue Paper for ability to distinguish whether a plane is under ATC or not (i.e. "Squawk 1200" equivalent capability).
    - "Altitude Off": It would appear from plenary discussion that this is an operational need to have the pilot either be able to turn off his altitude or set the altitude block as invalid. [AI 10-7] Jim Maynard will write an Issue Paper on this topic and – unless someone can propose an acceptable resolution – this item could be deferred until a later MASPS revision. Jerry Anderson said this is an important issue and needs to be addressed in Revision A.
    - Stand-by, i.e. no squawk: equivalent to turning off the transmitter. [AI 10-8] Jim Maynard will write an Issue Paper on this subject. (The 1090 requirement for "Stand-by Mode" in section 4.4.6 of DO-260 will be sighted.)

B. NIC/NAC/SIL briefing given to plenary by Jim Maynard.

- Latency of data source is viewed as an ASA MASPS issue. The ADS-B MASPS is to only deal with the latency attributed to the receiving and sending of the data within the ADS-B system.
- After some discussion about NIC after Charles Sloan questioned its usefulness, the plenary agreed that WG6 should continue with its plans to incorporate this material into DO-242A.

C. State Vector and Mode Status Report Re-organization briefing given to plenary by Jim Maynard.

- Questions were raised about the moving of airspeed from SV to an OC report. It was questioned what this data is to be used for and how often it should be transmitted and what latency is permissible. After some discussion it seemed to be agreeable since rate and latency requirements can be equal to those of DO-242.

D. Intent Briefing given to plenary by Tony Warren and Richard Barhydt.

➤ Plenary Discussion items:

- There was concern raised about changing the definition/criteria of Equipage Levels. WG6 feels the only change to these definitions is the inclusion of short-term intent (TSR) within the A1 equipage class. This requirement was also directly opposed by some.
- Ron Jones expressed concern that placing a requirement on an equipage class (A2 having a TCR) to which there is not data sources for would be harmful and costly.
- It was asked if the requirements for the TSR have been validated as needed. European activities such as Enhanced Surveillance and DAP were sighted in response.
- George Ligler stated his concern that if the core Europe 2020 model is accurate and if air-to-air requirements are increased to 150 miles as proposed in Europe and if multiple TCR reports are implemented, neither UAT or 1090 will be able to meet the long-range requirements for ADS-B.
- Tom suggested some different ways to get this information into the document:
  1. Appendix It
  2. Optional – if you do it, do it this way
  3. Put it all in the documents as required
  4. Rocky felt TSRs were important and should be in DO-242A, but it would be best to not couple it to the A1 equipage class.
- It was proposed that the WG6 proposal be accepted with TSRs being decoupled from A1 equipage, TCRs be optional for A2, and A3 equipage be deferred. This would allow WG6 to go forward with data structures, but not unduly burden MOPS development.

➤ Plenary Agreements:

- A0: State Vector only, no TSR allowed.
- A1: TSR is an allowable option, TSR definition is defined within DO-242A and an update rate at 20 miles if implemented.
- A2: TSR and single TCR required if the data is made available to the ADS-B avionics from the proper data sources. (The ADS-B equipment is required to support the capability.) The update rate for a single TCR at 40 miles will need to be defined.

- A3: Must support TSR and TCR+1. The final number of TCRs is yet to be defined and the management requirements for multiple TCRs will be placed in an appendix. The update rate for a single TCR and TCR+1 at 90 miles will need to be defined, with the update rates for TCR+2 . . . +n deferred. (While the number of TCRs is yet to be determined, the number of bits – probably 3 – for TCR sequencing will be defined.)
  - WG6 will need to work the range and update requirements for air-to-air operations.
  - WG6 will need to get some support if update rates for a second TCR for A3 equipment is to be specified. Paul Fontaine indicated he would look into getting WG6 that support.
  - Tom Mosher pointed out that resolution AND range (bits allocated) are needed for altitude, TTG, and Turn Radius.
  - Chris Moody stated in an off-line discussion at plenary that he thinks some requirements in Table 3-4 will need changing due to Intent changes.

E. Action Items from Plenary:

- Update rates for TSR and TCRs at all relevant equipage class operational ranges will be developed and distributed to WG3 and WG5.
- Number of bits to address number of TCRs (2 or 3) will be determined.

14. Telecon with WG5 on TSR and TCR update requirements. *(WG5 called into the WG6 meeting to clarify some of the agreements made at plenary regarding intent information. The following notes are from that telecon.)*

- This telecon was requested by WG5 to coordinate exactly what they will place in the UAT MOPS in accordance with what was agreed to for the MASPS in plenary.
- They are in agreement to put TSRs in the MOPS, but will need to have update requirements from WG6.
  - When is this to be transmitted?
  - What is the update requirement rate air-air?
  - What is the update requirement air-to-ground?
  - WG5 would like to have specific definition for conditions when the TSR is to be broadcast.
- They will also include TCRs in the MOPS at least to the extent of TCR+0, and will need update requirements for TCR+0. WG5 is unsure, however, if they will handle TCR+1 in their document because they are not sure if they can accommodate the update rates without doing some internal data compression.
  - WG5 needs range requirements for all required update rates.
  - WG5 is concerned about when TCR+0 and TCR+1 are both less than 2.5 minutes TTG.
  - Air-to-air range for the high update rates for TCR will be 50 nmi (2.5 minutes with 1200knot closure rate)
  - For TTG > 2.5 minutes:
    - 95% every 27 seconds at 90 nmi was Stan Jones' proposed requirement
    - 99% probability of receiving 1 TCR before 50 nmi was Tony's proposal (which George said would be an easy requirement to meet.

- It was proposed that a joint group of WG5 and WG6 work on the update rate requirements and have a finalized proposal before both groups meet in January. There can then be a telecon between the two groups to review that proposal at 12:00 noon eastern on Monday, January 14. The team members will be Chris Moody, Stan Jones, Warren Wilson, Tom Mosher, Tony Warren, Richard Barhydt, and Jim Maynard. The Working Groups will then telecon from their meetings on Monday January 21<sup>st</sup> at 1:00PM eastern. The group's work will include:
  - TSR and TCR update requirements for short range and less than 2.5 minutes.
  - TCR update rates for  $2.5 < TTG < 5.0$
  - A3 requirements for 90 mile TCR update rate for large TTG

15. Review of Action Item Status [et al]

- The action items were reviewed without comment.

16. Review Date and Place of Next Meetings [et al]

- It was agreed to extend the next WG6 meeting to a full five-day meeting.
- It was also agreed that the February meeting will take place in Arlington, VA instead of Phoenix, AZ.

January 28 – February 1	Boeing, Seattle WA 9:00am Monday thru 3:00pm Friday
February 12-15	Rockwell Collins, Arlington, VA 9:00am Tuesday thru 3:00pm Friday
April 8-9	RTCA, Washington DC 9:00am Monday thru 5:00pm Tuesday
April 10-11	SC-186 Plenary: RTCA, Washington DC

*\* tentative meeting locations*

17. Action Items

- See Table on following pages.

Action Number	Action Item Description	Assigned to	Status
10-1	Write a formal Issue paper for the IDENT request provided by Capstone and propose MASPS language for this capability.	Ken Staub	Completed (IP52)
10-2	Author Issue Paper requesting ADS-B capability to transmit code which distinguishes whether or not the flight is under ATC control (analogous to squawking 1200).	Bill Flathers	Completed (IP53)
10-3	Supply text for remaining TBDs for TSR and TCR requirements to Jim Maynard for incorporation into 242A-WP-11-01.	Richard Barhydt	
10-4	Incorporate material from 242A-WP-10-10 into next draft of the SV, MS, and OC Report Reorganization paper (242A-WP-11-01)	Jim Maynard	Completed (242A-WP-11-01)
10-5	Facilitate another round of discussion on Note 7 of Table 3-4 (IP35) with Stan Jones, Jonathan Hammer, Steve Heppe and Bill Harman and set up a telecon for the 3 <sup>rd</sup> week in January with the goal of bringing this to closure.	Stuart Searight	In Progress (12/27/01 email)
10-6	Request Stan Jones to author an Issue Paper on user population requirement proposal in 242A-WP-10-05.	Stuart Searight	Done (IP55)
10-7	Write an Issue Paper on the request from Capstone for the ability to stop transmitting altitude upon request for situations when pressure altitude is.	Jim Maynard	Completed (IP54)
10-8	Write an Issue Paper on the request from Capstone for ability to switch to "no squawk" or receive only mode. (The 1090 requirement for "Stand-by Mode" in section 4.4.6 of DO-260. will be sighted.)	Jim Maynard	
10-9	Incorporate obstacle definitions into MASPS glossary upon receiving the Airport Mapping document from Rudy Riana at RTCA.	Stuart Searight	
9-1	Edit letter to SC-181 (242A-WP-9-08) and draft letter to SC-159 regarding availability of integrity and accuracy components for PVT data.	Tom Foster	
9-2	Provide definitions on navigation reference point and ??? for inclusion in Appendix B	Ken Staub	
9-3	Develop and appendix from 242A-WP-5-04 to justify aircraft size coding requirements being added to DO-242A	Ken Staub	
9-4	Develop definitions for determining on-ground and airborne status from the perspective of when ADS-B systems need to transmit specific data similar to the approach taken in DO-260.	Jim Maynard	
9-5	Author new Issue Paper requesting clarification of definitions for coast and coast intervals.	Stuart Searight	Completed (IP50)
9-6	Revise 242A-WP-9-02 per WG6 review and distribute it by November 16.	Tony Warren Richard Barhydt	Completed (242A-WP-10-03)
9-7	Organize a telecon for November 20 (tentatively 1:00pm eastern) to discuss updated intent white paper.	Tony Warren	Closed
9-8	Write an Issue Paper regarding the analysis needed to address the accuracy and latency requirements for altitude rate in a future MASPS revision.	Tom Foster	
9-9	Coordinate with Rich Jennings regarding an IP requesting ADS-B equipment provide a transponder-like ID feature.	Ken Staub	Closed
9-10	Author an Issue Paper stating the need to have the ASA MASPS service levels carried into the ADS-B MASPS.	Jonathan Hammer	
9-11	Review the WG6 minutes and provide a list of "Coordination Issues" identified between WG6 and WG4.	Stuart Searight	

Action Number	Action Item Description	Assigned to	Status
9-12	Propose refinements to 2.1.2.10 of 242A-WP-9-01a to define the conditions for when a TCR needs to be re-issued. (This criteria will not just be a change in the TCP sequence as written in 242A-WP-9-01, but will also be set for "major" changes in the data set, which Tony will define. These changes will be reflected in the White Paper as well so that they are consistent.)	Tony Warren	
9-13	Re-write Short-Term Intent section of 242A-WP-9-01a with subsections for Target Altitude, Target Heading, and Target Track.	Richard Barhydt	Completed (242A-WP-10-10)
9-14	Email Steve, Bill, and Jonathan summarizing the WG6 discussion and agreed to resolution for IP35 and ask for any final comments on this topic.	Stuart Searight	Completed (11/16/01 email)
9-15	Examine the most demanding application for which they currently have understanding of provide the requirements for resolution (in meters) for the state vector report of horizontal position (lat/lon) for both airborne and on-ground aircraft. (This work might start in Appendix G.) Also requested are required SVR resolutions for geometric altitude, ground speed while on the surface, and vertical rate. (See table 3.4.3.1 of 242A-WP-9-01a)	Jonathan Hammer (WG4)	
9-16	Verify that 9 bits is a typo and should read 19 bits for amount of bits needed to support airborne applications in G.2.1 of Appendix G.	Jonathan Hammer	Closed (JH & SJ agreed on 1/3/02 that it should read "19")
9-17	Provide mathematical argument for arriving at required resolution for heading while on ground.	Jim Maynard	
9-18	Email Hal Moses and Jonathan Hammer informing them of WG6's plan for detailed briefings on DO-242A status, schedule, and plans.	Tom Foster	Completed (11/1/01 email)
9-19	Write and Issue Paper questioning the need for Report Mode in the State Vector Report. (site text at bottom of page 96 of DO242) Perhaps such a field is needed to convey what is known about a target, and whether it has yet been acquired.	Stuart Searight Jim Maynard	
9-20	Write up summarization of the discussion on coasting, and element validity being based message reception requirements.	Tom Foster	
8-1	Review and comment on proposed resolutions (LSBs) for TCR elements	Jonathan Hammer (WG4)	To be added to WG4/WG6 coordination list
8-2	Ask WG1 to examine possible con ops for air-ground uses of TCPs	Gary Livack	Completed (email 10/1801)
8-3	Provide WG6 with the finalized SC-193 definitions of Movable, Point, Line, and Closed-Polygon obstacles for incorporation into Appendix B.	Gary Livack	Closed (Rudy Riana will forward document to Stuart)
8-4	Rewrite section 2.1.2.2.2 to reference data smoothing algorithms in DO-185A rather than the new appendix previously agreed to which defined a simple Kalman filter.	Jonathan Hammer	Closed (242A-WP-9-01a)
8-5	Write brief paragraphs defining each of the Intent Capability Levels. (242A-WP-8-08)	Tony Warren	Completed (242A-WP-10-03)
8-6	Pull definitions for VFOM, HFOM, HPL, VPL, and EPU from GPS and/or RNP documents	Stuart Searight Jim Maynard	

Action Number	Action Item Description	Assigned to	Status
8-7	Draft a note - or text if needed - for Table 2.1.2.14 clarifying the limits of what integrity components are encompassed by the SIL value. This material will state clearly that SIL only represents the integrity of the sensor providing the current data along the lines of "SIL is for reporting the sensor source integrity that is associated with the containment radius of the data being transmitted."	Tom Foster, Tony Warren	Closed (242A-WP-9-01a)
8-8	Upon completion of the next draft of the TCP/Intent white paper, fill in the "TBD text" areas of draft section 3.4.3.5 "OC-TSR".	Richard Barhydt	Closed (242A-WP-10-10)
8-9	Create and Issue paper regarding On-Condition – Request for Information reports and include Jim’s draft material on this topic from 242A-WP-8-01.	Stuart Searight	Completed (IP 49)
7-1	Consider from an operational point of view whether a change in value which improves NIC or NAC needs to be updated at the same rate as the state vector just like a detrimental change does, or if it can be update at the lower update rate of the Mode Status report.	Jonathan Hammer (WG4)	To be added to WG4/WG6 coordination list
7-2	Formally forward 242A-WP-7-16 to WG4 for consideration in their ASA MASPS work, and inform Pierre and Jean-Claude Richard of our review and actions of their submitted comments.	Tom Foster	Completed (9/7/01 email)
7-3	Update draft of the MASPS language for re-organization of the SV and MS reports (242A-WP-6-11A) and distribute it to WG6 prior to the September meeting.	Jim Maynard	Completed (242A-WP-8-01)
7-4	Inform Steve Heppe of the agreed upon resolution of IP46 and it’s impact on closing of IP03	Stuart Searight	Completed (9/7/01 email)
7-5	Confer with Steve Heppe, Stan Jones, and Bill Harman and attempt to resolve IP35 to everyone’s satisfaction.	Jonathan Hammer	Completed (242A-WP-9-07a)
7-6	Incorporate into Appendix J the supporting study on altitude rate that demonstrated that geometric was the best altitude source followed by barometric, and then derived barometric.	Jonathan Hammer	Stuart needs to email Appendix J to Jonathan
7-7	Develop changes to Section 3.3.2, and Tables 3-3(a)&(b) addressing what messages each equipage class will be required to broadcast.	Jim Maynard	Partially Completed (242A-WP-8-01)
7-8	Write letter stating WG6 concerns with RNP MOPS and submit it to SC181.	Tom Foster	Closed (242A-WP-9-08) (AI 9-1)
7-9	Examine the MASPS and propose specific changes to clarify the MASPS requirements for surface position update rates to resolve IP13.	Carl Evers Rick Cassell	Completed (242A-WP-9-05)
7-10	Propose a label for an Emergency/Priority Status, and some new text for Appendix E to handle crash situations and Emergency Locator Transmitter functions. (IP41)	Bill Flathers	Completed
7-11	Tighten the wording in the State Vector requirements, that both barometric and geometric altitude shall be reported when available, and clarify what is meant by "when available". (IP42)	Jim Maynard	
7-12	Submit an addendum to IP43 discussing reasons why it was withdrawn.	Bill Flathers	Completed
7-13	Rework 242A-WP-6-02 per WG6’s discussion at their August meeting on this Issue Paper	Stuart Searight	Completed (242A-WP-8-01)
7-14	Determine what changes are needed for removal of Turn Indication as a required SV element	Stuart Searight	
7-15	Implement proposed changes for IP 36	Stuart Searight	

Action Number	Action Item Description	Assigned to	Status
7-16	Propose language that will define when an aircraft is considered on the ground and when it is airborne and the transitions in-between these states and propose what needs to be broadcast dependant on these states..	Ken Staub Bill Flathers	Completed (242A-WP-9-09)
7-17	Reword Issue Paper 19 to reflect the broader context of runway incursion alerting this paper now represents.	Gary Livack	
6-1	Draft letter to SC-181 asking if accuracy fields can be output on an avionics bus so that they can be used by ADS-B and if DO-229A GPS receiver's outputs (HFOM, VFOM, HPL) satisfy the requirements of DO-236A. (This will also close AI's 3-1 & 4-6.)	Tony Warren	Closed. (AI 9-1)
6-4	Search entire MASPS for instances of "NUC", "integrity", and "accuracy" to assure NIC/NAC changes are complete.	Stuart Searight	
6-5	Clarify Tables 2-2 and 2-3 and all text referencing these tables. (This material is not ADS-B requirements, but is rather "anticipated application requirements".)	Stuart Searight	
6-8	Write specific MASPS changes for air-reference velocity vector and IP37.	Richard Barhydt Jim Maynard	Completed (242A-WP-8-01)
6-9	Collect simulator data that will justify/support the MASPS IP37 changes.	Tony Warren	Completed (242A-WP-8-09)
6-10	Draft specific MASPS changes that address Aircraft size characteristic (IP04) and navigation reference point (IP14).	Ken Staub	Completed
6-11	Clarify or change wording in proposed MASPS changes for IP05 so that anonymous addresses will be reset if duplicate addresses are detected.	Ron Jones	
6-18	Review the proposed revision of Table 3-5 in 242A-WP-6-11 and determine if it adequately resolves IP29 on the reporting of both geometric and barometric pressure altitude.	Steve Heppe	
6-21	Examine to what accuracy does heading need to be recorded for aircraft on airport surface.	Ken Staub	Completed by Jim Maynard
6-22	Verify the accuracy of Note #3 on page 8 of 242A-WP-6-11.	Tony Warren	Closed
5-1	Write an Issue Paper documenting the issues and concerns related to passive ranging. This Issue Paper will <u>not</u> be addressed in Rev A.	Jim Maynard	
5-3	Author a proposed footnote to the definition of ADS-B which talks to the link flexibility and protocol issues in response to the groups discussion on IP30.	Dan Castleberry	
5-15	Propose any needed additional aircraft/vehicle categories listed in 2.1.2.1.3. (IP06)	Gary Livack	Closed (242A-WP8-01)
5-20	Coordinate about work being done to resolve IP23 and IP32 regarding a way to map ADS-B capabilities, applications, features, and intended functions to the draft Advisory Circular on Guidelines to the Operational Approval for ADS-B Avionics.	Gary Livack Jim Maynard	
4-4	Write a note for Table 2-1a and 2-1b to address the independence of the accuracy and integrity values and to clarify the reference to DO-236A	Tony Warren	CLOSED (242A-WP-9-10)
4-6	Consult with Boeing navigation experts to obtain inputs on the MASPS definitions of navigation containment and integrity for consistency with RNP and GNSS standards	Tony Warren	Closed
4-7	Provide IP on proposal for ADS-B requirements to address formation flight characteristics	John Gonda	Also see AI 5-21

Action Number	Action Item Description	Assigned to	Status
3-1	Formulate proposed requests of SC-181 regarding placing requirements on DO-236 (RNP) to provide inputs for ADS-B as it relates to NIC/NAC.	Tony Warren	Closed
3-6	Write White Paper on backward compatibility subject	Tom Foster	
3-9	Write comments to IP15 explaining rationale for rejecting	Dan Castleberry	
2-15	Produce IP on protecting ADS-B services from other services provided by a shared data link	Tom Foster	Closed IP48
2-16	Write ad hoc group's response to issue #3 of IP7 that will put issue in broader context and serve as proposal to WG#4 for consideration in the ASA MASPS.	Dan Castleberry	