ASAS MOPS FRAC Draft 24 April 2008
COMMENT MATRIX

*Importance
CRITICAL (C): Comments of a serious nature.
SUBSTANTIVE(S): Comments of substantial merit which are important, but not critical.
EDITORIAL (E): Comments that address items such as typographical, format or other grammatical errors.
Return your forms to RTCA electronically to Hal Moses (E) hmoses@rtca.org and cc: Jonathan Hammer (E) jhammmer@mitre.org, Sethu Rathinam (E) srrathin@rockwellcollins.com and Chris Moody (E) cmoody@mitre.org no later than 4:30 p.m. EST, April 21, 2008.

No.	Reviewer Name	PAGE	SECTION	*C S E	COMMENT / RATIONALE	PROPOSED RESOLUTION
1.	Bone			S	Is there a need to continually display to the flight crew the ownship flight identification being broadcast? If it were shown to the flight crew, they could confirm and see on an on-going basis what was being broadcast. There have been concerns about bad flight identifications being broadcast without the flight crew knowing. If this not a requirement now, it may be a later requirement.	Consider whether this is necessary for any applications that may use flight identification or a more general requirement. Also consider whether it should be a "may" or note to allow for the future applications that require the use of flight identification. **Out of scope of ASAS**
2.	R. Brandao				deleted	
3.	Terry Abbott	All	All	E	Recommend changing "breaking hyphens" throughout the document for non-braking hyphens for special terms, e.g., ADS-B.	See comment.
4.	Joel Wichgers	All	All	E	Please number all the "shall" requirements. This is very helpful for requirements discussion within RTCA and coordination with other groups, as well as for manufactures to build to these requirements.	Number all the "Shall" requirements.

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5.	Honeywell		General	C	This document is not ready for publishing in its present state. The requirements text regarding the tracking and correlation algorithms are not mature enough. The CD application should be removed from the document until significant flight test has been performed to validate the alerting algorithms.	Schedule at least two more working group meetings to finish maturing the existing text. Remove CD from the document.
6.	Honeywell		General	E	DO-160E has been superseded by DO-160F	Reference DO-160F throughout
7.	Honeywell		General	E	DO-185B will be published shortly.	Reference DO-185B throughout
8.	Honeywell		General	E	Change "Correlation Window Test" to "Correlation Window Criteria" throughout	
9.	Honeywell		General	E	Ensure all "shalls" are in bold font	**shall**
10.	Honeywell		General	E	Remove the "[]" from behind the "shalls"	Change as proposed
11.	Honeywell		General	E	Which is it: "own-ship" or "ownship"	Be consistent
12.	Honeywell	137	General	S	Remove references to "OEM". Anyone can specify a different way of doing things.	Remove references to OEM ACCEPT
13.	Honeywell	App. C	General	E	In several places, there is a footnote ("1") mark without a correlating footnote.	Resolve.
14.	Honeywell	App. G	General	S	There is very little substantive guidance in this appendix. It can't be used for certification purposes, so why not remove it?	

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15.	Craig Pettit	General	General	E	Noticed that there is not a Reference Document section in this document. Other documents are referenced throughout the document so a Reference Document section should be included.	Include a Reference Document section in this document.
16.	Joel Wichgers	33	General Section 2 comment	C	The means that has been proposed in numerous sections for "required" algorithms are not specified in a complete, comprehensive, nor are testable manner (e.g., a parameter multiple of xyz). We either need to either: 1) specify the required performance requirements that are testable (which is strongly preferred), or 2) specify the exact algorithms (ala TCAS). The half specification of algorithms as given in this draft MOPS are not a clear and comprehensive specification of the requirement and are not testable.	Specify the required minimum performance requirements in a testable manner, and change all the algorithms to "Example algorithms" (left with parameters) or "One acceptable means" (with full and comprehensive algorithm definitions).
17.	Sethu Rathinam	General		S	Treatment of ADS-R in addition to ADS-B and TIS-B needs to be made consistent throughout the document.	<Appropriate note in the beginning?>
18.	Sethu Rathinam	General		E	EVApp is used sometimes as typed here, sometimes with a period after	Use 'EVApp" exactly.
19.	AIR-130	-	-	E	Too many acronyms for reader of MOPS.	Some acronyms should be spelled out (with or without the adjacent acronym) unless they obvious and common throughout the MOPS, or spelled out locally, such as in the section

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						title. These might include: A/V, AGL, ANSD, ASA, CAZ, CDZ, CNS, CPA, EPU, GA, HAE, HMI (which also often means "human machine interface"), ICR, LOS, RC, SBS, SSR, TMC, TOA, TSE, VEPU.
20.	AIR-130	-	-	E	Broaden scope of CDTI in next revision of the MOPS (rev A), to address 3D perspective displays.	Scope of next revision of MOPS should include the depiction of traffic looking forward (e.g., on Primary Flight Display or Sythetic Vision System).
21.	Joel Wichgers	Many	Many	S	DO-160F was approved by the RTCA PMC on Dec. 6, 2007. We should change all references from DO-160E and DO-160D to DO-160F.	Change all referenced in the document from DO-160D and DO-160E to DO-160F. **ACCEPT**
22.	Joel Wichgers	Many	Many	S	Every place the document indicates position or velocity uncertainty, it is necessary to indicate that these are 95% uncertainties.	Change "uncertainty" to "uncertainty (95%)".
23.	Joel Wichgers	Many	Many	S	Globally replace "height above ellipsoid" with "geometric altitude" for consistency with all the other RTCA ADS-B standards documents including DO-242, DO-289, DO-260/DO-260A, DO-282/DO-282A.	Globally replace "height above ellipsoid" with "geometric altitude". ACCEPT make all "geometric altitude (HAE)"—add not to be confused with MSL
24.	Joel Wichgers	Many	Many	E	Editorial: Consistently use "own-ship" or ownship".	Globally search and replace all "ownship" with "own-ship".
25.	Petri		Throughout	E	Shall and Shall[] need to be made consistent	I expect this will be done when numbers are added to the requirements.
26.	Sethu Rathinam	1, general	1.1	E	Uses of ownship, Ownship, own-ship etc. need to be consistent.	Pick one and use it throughout the document.

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27.	Honeywell	2	1.2.1	E	Extra “)” in 2nd bullet	Remove extra “)”
28.	Sethu Rathinam	2	1.2.1	E	Fix commas in last sentence.	“(UAT) systems respectively, …”
29.	Joel Wichgers	3	Figure 1-1, 1.2.1	E	The dashed line indicating the scope of the ASAS MOPS is not clear, as it implies that it also covers half of the ADS-B/TIS-B Report generation function. As is indicated in the last sentence of §1.2.1, the scope of this MOPS is the ASSAP and CDTI functions.	Alter the size of the dashed box indicating the scope of this MOPS, such that it does not include the arrow that says “ADS-B / TIS-B Reports.”
30.	Joel Wichgers	3	Figure 1-1, 1.2.1	S	The Figure is not correctly labeled in three areas. 1) The arrow from the “Ground Systems” should not be labeled “ADS-B Messages”. The messages broadcast by ground systems are TIS-B and ADS-R. 2) The “ADS-B / TIS-B Receive Subsystem” is missing ADS-R. 3) The “ADS-B / TIS-B Reports” arrow is missing ADS-R / Reports”.	Change labels in Figure 1-1 as follows: 1) Change “ADS-B Messages” label between the Ground systems and the subsystems for ASA receive participant to “TIS-B / ADS-R Messages” 2) Change the “ADS-B / TIS-B Receive Subsystem” label to be “ADS-B / ADS-R / TIS-B Receive Subsystem”. If this is done, a ‘smart’ global search for “ADS-B / TIS-B” to be replaced with “ADS-B / ADS-R / TIS-B”. 3) The “ADS-B / TIS-B Reports” arrow should be labeled “ADS-B / ADS-R / TIS-B Reports”. **ACCEPT**
31.	Bone	3	1.2.2	E	I am not sure the applications only “augment…see and avoid.” They also help with general traffic awareness and other things.	Modify or delete text to appropriately reflect the goals of the applications.
32.	Sethu Rathinam	3	1.2.2	E	… defined in section 1.3	… described in section 1.3

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33.	Terry Abbott	3	1.2.2	E	While I fully realize that we are "stuck" with the phrase "situational awareness" in the title of the previously defined application, we do not need to continue to propagate this incorrect phraseology. The phrase "situational awareness" is not technically correct, e.g., "traffic situational awareness applications." The correct term is "situation awareness," not "situational awareness." Reference Endsley, numerous 1989-2006; Glaser, 1989; Kozlowski, 1998; Klein, Moon, and Hoffman, 2006. The use of the phrase "situational awareness" suggests that we don't understand the concept.	Where appropriate in the text, e.g., everywhere but the application titles, change "situational awareness" to "situation awareness."
34.	Bone	5	1.3.1	C	Could you not do an ASSAP & CDTI with only ASSA or FAROA as the minimum requirement? Why is EVAcq required if you only want to do ASSA and / or FAROA?	If this is determined to be desirable, don't require EVAcq as a minimum requirement. Allow for ASSA and / or FAROA-only implementations. **Doc is consistent with ASA MASPS. Too big a change to doc at this point anyway**
35.	Sethu Rathinam	5	1.3.1	E	"… by advising the flight crew about" – modify to introduce the that CD is for non-TCAS aircraft	"… by advising the flight crew of non-TCAS equipped aircraft about"
36.	Joel Wichgers	5	1.3.1	E	The last sentence in the paragraph describing the CD application should be clarified that the CD requirements in this MOPS version are not intended to be referenced by regulatory guidance. Future	Change the last sentence of the CD paragraph: "If an applicant chooses to implement CD, the requirements in this document may be referenced; however, the CD requirements in this MOPS version are not intended to be

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					versions of this MOPS may contain a mature version of the CD application requirements that are intended to be referenced by applicable regulations (e.g., TSO). Grammar – A comma after "however" is needed for proper punctuation.	referenced by regulatory guidance."
37.	Sethu Rathinam	6	1.3.2	E	"This may be required for future applications"	"Use of some type of ACL may be required for future applications"
38.	Joel Wichgers	6	1.3.2	S	This section overview ASA MASPS "Future Application" items and have not be addressed in this version of the MOPS, including the "ASA Capability Level (ACL)". I think that we should also add a similar paragraph about Transmit Quality Level (TQL).	Add the following new paragraph to the end of §1.3.2. "Transmit Quality Level (TQL) has not been addressed within this document. The TQL concept was included in the ASA MASPS to address transmit quality factors that have not been included in DO-242 and DO-242A compliant link MOPS. The additional quality information in not needed to support the applications addressed in this version of the ASAS MOPS." **ACCEPT**
39.	AIR-130	6	1.4	E	Current Text: "The intended function of equipment built to the specifications in this MOPS is to **perform the processing and displaying** that support…" More generally, its about the interface, which includes controls.	The intended function of equipment built to the specifications in this MOPS is to **provide the processing and human-system interface** that support…
40.	AIR-130	7	1.5.1.1	S	Mentions RTCA DO-236B in 4th line. This MASPS contains many performance	Delete the DO-236B MASPS reference, or be more explicit.

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					factors, so which ones are sought? Furthermore, no manufacturer has yet to claim compliance to DO-236. (Airbus may market compliance, but it's to Draft 8 of the DO-236 MASPS, and then only with GPS.)	**DO-236 is deleted**
41.	R. Brandao	7	1.5.1.1	S	Latency only has meaning if it is clear from what reference it is measured against.	Please reference a section where latency is clearly defined and from where it is measured. **Dons action will deal with this. We may need pointer in this section to the new DW appendix.**
42.	Terry Abbott	7	1.5.1.1	E	The section title uses "Own-ship," but this and previous sections use "ownship."	Remove the hyphen "-" from all uses of ownship. Similar issue with "own ship."
43.	Joel Wichgers	7	1.5.1.1	C	The statement that Own-ship position data will be delivered to the ASSAP such that the uncompensated latency is less than 600 ms is not always correct when interfaced with FMS systems complaint with ARINC 702A. Data concentrators that are on many real aircraft architectures between the navigation output and the ASSAP will add additional delay over and above the 600 ms specified by ARINC characteristic 702A. Furthermore, the forward implication in	The 600 msec uncompensated position latency assumption is not compatible with aircraft architectures that have data concentrators. It should be 1 second maximum latency as specified in the ASA MASPS between A1 and B1, and do not sub allocate the compensated and uncompensated latency. I did not catch that this uncompensated latency assumption was also made in the STP MOPS. 600 msec is for the uncompensated latency for position output, but additional time is needed from the sensor output until the information makes it to the STP/transponder or ASSAP to allow aircraft architectures that incorporate

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					Table 2-1 on page 43 which indicates that the "Maximum Latency" does not exceed 600 ms. There is a big difference the terms between "Maximum Latency" from a Navigation Source and the "uncompensated latency." GNSS receivers have a specified maximum latency of 700 msec (500 msec from Time of Measurement to TOA, and 200 msec from TOA to output – see RTCA DO-229D sections 2.1.2.6.2 and 2.1.3.6.2, and RTCA DO-253B section 2.3.10.4.). I will discuss this issue further with a comment on Table 2-1.	data concentrators between them.
44.	AIR-130	7	1.5.1.7	C	**TIS-B and ADS-R Service Status.** - This paragraph indicates that there are no requirements for TIS-B service status. - This document must define requirements for TIS-B and ADS-R service status. The pilot needs to know how complete the surveillance picture is. This includes BOTH UAT and 1090ES. - Realize that current SBS and Link MOPS don't support, however the requirement needs to be driven!	Add requirements for TIS-B and ADS-R Service Status. NEED OPS CONCEPT FOR THIS. Chip will bring proposal for requirements later in the week.
45.	AIR-130	9	1.5.11	S	- The MOPS does not address the fact that many DO-260 targets will be transmitting information that won't have been certified, and thus could be inaccurate.	-We will put an assumption in the front that ASSAP will assume that all received data is as advertised.

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					- How will the MOPS address receiving DO-260 targets which are not certified?	
46.	AIR-130	-	1.X	S	The MOPS needs to outline the fact that the full traffic picture only exists out to 15 nm horizontally and +/- 3000 feet vertically due to the limitations of TIS-B and ADS-R.	Incorporate the following statement somewhere in section 1.2, 1.3. or 1.5 as appropriate: "The ASAS will only assure a comprehensive traffic picture within 15nm horizontally and +/- 3000 feet vertically of ownship. This is due to limitations with TIS-B and ADS-R" **Make it a note and say it MAY**
47.	D. Miller	15	2.2.1	E	Include "ADS-R" in "Receive Subsystems" box and "Reports" input arrow in Figure 2-1	
48.	D. Miller	15	2.2.1	E	Include "ADS-R" in parentheses at bottom of page	
49.	Honeywell	33	2.2.1.3.1	C	The performance desired in this section is not clear. These requirements need matured.	ACCEPT
50.	AIR-130	16	2.2.2	E	Fig 2-2. What is a "map *available*"?	Replace "map available" with "electronic map" or "map", etc.
51.	D. Miller	16	2.2.2	E	Include "ADS-R" in "Receiver" box in Figure 2-2	
52.	Joel Wichgers	16	2.2.2.1	S	The ADS-B / TIS-B receiver must also receive ADS-R.	Globally change the term "ADS-B / TIS-B" with "ADS-B / ADS-R / TIS-B". **ACCEPT**
53.	Terry Abbott	16	2.2.2.1	E	In " UAT (RTCA DO-282A())" remove the "()."	See comment.
54.	Edward Lester	17	2.2.2.1.1	E	In part e, the shall is not bold. Also in 2.2.2.5 (pg 25) paragraph 2.	Suggest setting to bold, and doing a global search on "shall" to make sure all are bold for

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						consistency.
55.	Edward Lester	17	2.2.2.1.1	S	In part d, "when on Surface" is unnecessary. It implies that the ASSAP function shouldn't receive heading when in the air. The "when available" is enough of a qualifier.	Remove "when on Surface" from requirement d. DONE
56.	Edward Lester	17	2.2.2.1.1	S	The requirement in part c is a duplicate of part e. If N/S E/W velocity is received by the ASSAP function, ground speed (and ground track) can be calculated. It is unnecessary to require ground speed as a separate piece of traffic state data.	Remove part c ("The ASSAP function shall receive Ground Speed…" **These are separate fields with one form for surface format and another for airborne. No change.**
57.	Joel Wichgers	17	2.2.2.1.1 item "d"	S	For item "d", there are three problems: 1) surface vehicles can report "heading" or "ground track", not just heading, 2) it is unclear what the term "surface" is referring to as written, and it could be incorrectly interpreted to mean the air-to-ground state of the ownship ASSAP function, and 3) ADS-R is also required to be received (a global problem identified above).	Change item "d" as follows: d. The ASSAP function **shall** receive heading (i.e., true or magnetic heading) or Ground Track ~~when on~~ for Surface vehicles ~~(i.e., true or magnetic heading)~~ from the ADS-B / ADS-R / TIS-B receiver when available. **ACCEPT—leave all other refs to Heading in the doc unchanged.**
58.	Joel Wichgers	17	2.2.2.1.1 item "e"	S	For item "e", it is not clear what the term "airborne" is referring to as written, and it could be incorrectly interpreted to mean the air-to-ground state of the ownship ASSAP function.	Change item "e" as follows: e. The ASSAP function **shall** receive N/S and E/W velocities~~y~~ ~~when~~ from airborne reporting traffic from the ADS-B / ADS-R / TIS-B receiver when available. **editorial**
59.	Mosher	17	2.2.2.1.1.i	S	I don't know about 1090ES, but the UAT	

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					datalink does not transmit the vertical rate type. This requirement cannot be met without a datalink MOPS update. Recommendation: add "if available".	
60.	Mosher	17	2.2.2.1.1.i	S	I don't know about 1090ES, but the UAT datalink does not transmit the vertical rate type. This requirement cannot be met without a datalink MOPS update. Recommendation: add "if available".	**Vertical Rate is transmitted—ok as is**
61.	Joel Wichgers	19	2.2.2.2 item "b"	S	For item "b", which state that the ASSA function shall receive information from TCAS, one needs to qualify "when available" as has been done for all the other items.	Change item b as follows: "b. The ASSAP function **shall** receive the TCAS Track ID from TCAS when available. editorial
62.	Joel Wichgers	19	2.2.2.2 item "d"	S,E	For item "d", which state that the ASSA function shall receive information from TCAS, one needs to qualify "when available" as has been done for all the other items.	Change item d as follows: "d. The ASSAP function **shall** receive the TCAS Traffic range from TCAS when available.
63.	Joel Wichgers	19	2.2.2.2 item "g"	E	For item "g", indicate that the altitude rate is "pressure" altitude.	Change item e as follows: "g. The ASSAP function **shall** receiver the Traffic Pressure Altitude Rate from TCAS when available.
64.	Joel Wichgers	19	2.2.2.3	S	For surveillance purposes, we use "position and velocity sources" and not necessarily "navigation sources". The position and velocity source being used for the ADS-B surveillance applications may not be the same source as is being	Change: 1) Title of this section to "ASSAP Input Requirements from Own-ship Navigation Source". 2) Add the following note after the first

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					used for navigation (e.g., may use GPS for ADS-B applications, but blended FMS position solution for navigation). Furthermore, many parameters are missing, and it is not clear that this requirement also holds for many other parameters including horizontal accuracy, geometric altitude, geometric altitude rate, etc. as indicated in the recommendation.	paragraph: "*Note: The term navigation source used in this document is a potential source of position and velocity information that may be used by ASAS equipment. It is not meant to imply that the same source is used for navigating the aircraft."* **ACCEPT** 3) Change the second paragraph to: "The ASSAP function **shall** use the same data source for all of the following own-ship parameters: horizontal position ~~and navigation data~~, geometric vertical position (height above ellipsoid), horizontal velocity, and geometric altitude rate which includes latitude, longitude, horizontal accuracy data (e.g., HFOM, EPU), horizontal integrity data (e.g., HIL/RNP/ANP), geometric altitude (height above ellipsoid), N/S velocity, E/W velocity, and geometric altitude rate. Mixing of data (e.g., use latitude from Global Navigation Satellite System (GNSS) and longitude from FMS) is prohibited between the possible input data sources. If the horizontal position data from a navigation source is not valid, then no data from that ~~navigation~~ source **shall** be accepted." **OBE**

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65.	Hilb	19	2.2.2.3	c	Section does not allow using N/S and E/W velocity from IRU if it is better than GPS velocity or if GPS velocity is missing. It should also allow the use of fusion of position sources such as using TCAS ranging to refine Lat/Long. Since GPS velocity is basically an independent calculation from position, if one is missing the use of the other should be allowed.	Change section. **Bob to draft text**
66.	Joel Wichgers	20	2.2.2.3.1	S	Item f. There is a missing requirement that the source of "Pressure Altitude" must be the same source as is used for Mode C altitude reporting. Furthermore, based on the item "a" requirement in this section which says that the ASSAP function shall receive TOA from the own-ship navigation source, typically air data systems do not output TOA with the Pressure altitude. Thus, I have proposed deleting the word "navigation source" from this requirement, and have used the more generic word "source" instead.	Change item f as follows: "The ASSAP function **shall** receive the Pressure Altitude from the same source that is used for own-ship ~~navigation sources~~ Mode C altitude reporting when available." **ACCEPT**
67.	Joel Wichgers	20	2.2.2.3.1	S	Item h. There is a missing requirement that the source of "Pressure Altitude Rate" must be the same source that is used pressure altitude (i.e., you cannot take	Change item h as follows: "The ASSAP function **shall** receive the Pressure Altitude Rate from the same own-ship ~~navigation sources~~ source that is providing

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					Pressure Altitude from the left air data system, and the Pressure Altitude Rate from the right air data system.). Furthermore, based on the item "a" requirement in this section which says that the ASSAP function shall receive TOA from the own-ship navigation source, typically air data systems do not output TOA with the Pressure Altitude Rate. Thus, I have proposed deleting the word "navigation source" from this requirement, and have used the more generic word "source" instead.	Pressure Altitude when available." **ACCEPT**
68.	Joel Wichgers	20	2.2.2.3.1	SE	Item j: Based on the item "a" requirement in this section which says that the ASSAP function shall receive TOA from the own-ship navigation source, typically attitude systems do not output TOA with the heading. Thus, I have proposed deleting the word "navigation source" from this requirement, and have used the more generic word "source" instead.	Change item j as follows: "The ASSAP function **shall** receive the Heading when on Surface (i.e., true or magnetic heading) from ~~the~~ an own-ship ~~navigation sources~~ source when available.
69.	Mosher	20	2.2.2.3.1	S	Throughout this section, I disagree with the requirement that the ASSAP function takes its reference point from the Navigation source. I believe that ASSAP should be referenced to the ownship SV data that the ADS-B equipment is using.	**Its that way to reflect boeing airbus architecture**

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					They're not necessarily the same thing.	
70.	Edward Lester	20	2.2.2.3.1	S	The requirement in parts d and e are duplicates of part c. Ground speed and ground track can be calculated using N/S E/W velocity components. It is unnecessary to require ground speed and ground track as separate pieces of own-ship state data.	Remove part d ("The ASSAP function shall receive the True Track Angle…") and part e ("The ASSAP function shall receive the Ground Speed from..") **These are separate fields with one form for surface format and another for airborne. Heading is not redundant in any case. No change**
71.	AIR-130	20	2.2.2.3.1g	E	The note is a requirement, since it uses "must".	Move note, so that it's part of the requirement.
72.	Joel Wichgers	21	2.2.2.3.2	SE	Item c: GPS requirements in RTCA SC-159 is moving forward with outputting or characterizing the HFOMv and VFOMv (for horizontal and vertical figures of merit for velocity), and not individual N/S and E/W velocity accuracy estimates.	Change item c as follows: "The ASSAP function **shall** receive ~~the N/S E/W~~ Horizontal Velocity Accuracy when available."
73.	Joel Wichgers	21	2.2.2.3.2	S	Item g: Is not the correct requirement. What system external to the ASSAP function is going to determine SIL and provide it to ASSAP? It is a requirement of ASSAP to determine the SIL for the own-ship position information.	Delete requirement g. Add an ASSAP processing requirement that the ASSAP function shall determine SIL. Use words from the STP MOPS. "~~g. The ASSAP function **shall** receive the Surveillance Integrity Level when available.~~" Add a new section: "Determination of Own-ship SIL". Incorporate ASSAP requirements for determining SIL based upon the requirements defined in the STP MOPS / DO-

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						302 (§2.2.4.4.2). Make above text new bullet g
74.		50	2.2.2.4	s	The section should allow Closure Rate or Differential Ground Speed. In many cases Differential Ground Speed is more useful that Closure Rate.	Add language to allow Differential Ground Speed
75.	Sethu Rathinam	21	2.2.2.5	E	SSM status flags – too much low level detail	Delete "SSM status flags"
76.	R. Brandao	22	2.2.2.5.1.1	S	The MOPS requires ASSAP provide at least 60 tracks to the CDTI function. This seems like an excessive number for smaller GA applications (perhaps with the exception of CD application). Would not many GA users be very well served by a system that could provide display of the 10 closest or most "threatening" aircraft. Section 2.3.4.3 requires that the CDTI support at least 16 traffic.	Reduce the minimum traffic capacity provided to the CDTI to a smaller number. **Honeywelll GA is ok as it is**
77.	Mosher	22	2.2.2.5.1.1.	S	Sixty output tracks is far more than is useful to the flight crew. No flight crew is going to be able to make use of 30 airborne and 30 on-ground targets at once. Better if this requirement said to provide at least 30 targets that are appropriate for the intended use. The CDTI can signal to ASSAP what sort of targets it wants to display.	**CDTI requires only 16 to be transmitted**
78.	AIR-130	25	2.2.2.5.1.10	E	Note 2 doesn't make any sense	Suggest rewording note to Read: *Traffic Altitude is used for displaying relative*

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						or actual altitudes for traffic. Ownship pressure correction is also needed for the CDTI to calculate traffic actual altitude.
79.	AIR-130	25	2.2.2.5.1.11 b	E	Geometric Altitude. There is no mention of WGS-84, as in 2.2.2.3.1(g).	Add reference to WGS-84.
80.	Joel Wichgers	25	2.2.2.5.1.12	C	There are several problems with "Traffic Track Angle" section. Firstly, traffic track angle may not always be sent to the CDTI, because on the surface, heading is actually preferred and track angle may be provided when heading is not available. The second problem is that the equipment does not know when the "traffic track angle error" is greater than 30 degrees. If the equipment knew the error, it would take it out. It can make an assessment of the directional "uncertainty". The third problem is that I do not concur with the guidance manufactures are suppose to follow in Appendix D for assessing the 95% uncertainty of directionality for received Traffic.	I have 5 recommendations: 1) Rename this section to "Traffic Track Angle / Heading (Traffic Directionality)" because the directionality may be based upon track angle or heading. 2) Change requirement item "a" as follows: "a. The ASSAP function **shall** provide Traffic Track Angle / Heading for traffic sent to the CDTI when available." 3) Change item "c" as follows: For traffic reporting airborne messages, the following requirements apply: 1. The Traffic Track Angle **shall** be determined based upon the Traffic Reported N/S and E/W velocities, when available and valid. 2. The Traffic Track Angle **shall** be considered invalid when the traffic track angle ~~error~~ uncertainty (95% accuracy characterization) is greater than ±30 degrees. ~~See Appendix D for information on traffic track angle errors.~~ One acceptable means to comply with

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						determining whether the Traffic Track Angle meets the above 95% uncertainty requirement is as follows: The computed Traffic Track Angle can be considered to be valid when at least one of the following conditions apply: a. When traffic groundspeed ≥ 35 knots (TBV) and traffic N/S and E/W velocities are valid, b. When traffic groundspeed ≥ 17 knots (TBV), traffic NACv = 1, and traffic N/S and E/W velocities are valid, or c. When traffic groundspeed ≥ 5 knots (TBV), traffic NACv ≥ 2, and traffic N/S and E/W velocities are valid. When none of the conditions above apply, the Traffic Track Angle should be considered invalid. 4) Add item "d" to the requirements in this section as follows: d) For traffic reporting surface messages, the Traffic Track Angle / Heading **shall** be determined based upon the Traffic Track Angle or Heading in the last report, when available and valid. Else, the Traffic Track Angle / Heading **shall** be set invalid for surface traffic.

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						5) Delete Appendix D.
81.	Mosher	25	2.2.2.5.1.12	S	This requirement does not say who (ASSAP or CDTI) does the "considering". It's impossible for the receiver of an ADS-B report to know what the error in the track angle measurement is.	OBE Joel comment
82.	AIR-130	26	2.2.2.5.1.13 b	E	Current text: Traffic Vertical Direction shall be provided as either actual traffic vertical rate or as an indication whether the traffic vertical direction is climbing, descending, or level. Need to use a term that is consistent with 2.2.2.2(i), which uses "vertical sense" (assuming that is the actual term used in TCAS DO-185A).	Traffic Vertical Direction shall be provided as either actual traffic vertical rate or as **traffic vertical sense (**an indication whether the traffic vertical direction is climbing, descending, or level**)**.
83.	AIR-130	26	2.2.2.5.1.13 c	E	Use a term consistent with 2.2.2.2(i), which uses "vertical sense."	If the traffic vertical ~~direction~~ **sense** is calculated by ASSAP a climb shall be indicated when there is a positive vertical rate exceeding 500 feet per minute (fpm); a descent shall be indicated when there is a negative vertical rate exceeding 500 fpm.
84.	R. Brandao	26	2.2.2.5.1.16	S	Traffic Application Capability is not a minimum requirement of the CDTI. In some cases Traffic Application Capability may be used by the CDTI.	Update bullet "a." to read as follows: "The ASSAP functional shall provide a Traffic Application Capability for traffic sent to the CDTI if it is required for the CDTI" **This MOPS does not preclude having some of the ASSAP functionality associated with the display hardware.**
85.	Petri	26	2.2.2.5.1.16	S	This section is somewhat confusing. It would be more straightforward to	Replace the section with this:

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					generalize the terms, as there is no difference in the meanings of Invalid, Valid (and Degraded) for the individual applications.	*Note: "Traffic Application Capability" is equivalent to the term "Traffic Information Quality" as used in DO-289.* a. The ASSAP function shall provide a Traffic Application Capability for traffic sent to the CDTI. b. The Traffic Application Capability shall be provided for all available applications (not just the active applications). c. The Traffic Application Capability shall include that the traffic application capability is either Invalid or Valid. • Invalid: Traffic is not qualified to support the application. • Valid: Traffic is qualified to support the application. *Note: Traffic invalid for the EVAcq application does not meet the minimum performance criteria for display. Based on the Best Track Selection requirements, the traffic will be replaced with a correlated TCAS track if available. For an ADS-B, ADS-R, or TIS-B track not correlated with a TCAS track, the manufacture may choose to either not send the traffic to the CDTI since it does not meet the performance for the minimum required application (EVAcq.) or mark the traffic as invalid.*

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						d. For installations supporting ASSA/FAROA with optional degraded performance, application, the Traffic Application Capability shall include that the traffic application capability is either Invalid, Degraded Performance or Valid. • Degraded Performance (Optional): Traffic is qualified for ASSA and FAROA, but with degraded performance. **We will keep it as is**
86.	AIR-130	28	2.2.2.5.1.17.2	E	Reword using correct TCAS terminology. Current text: "… no threat, proximity traffic, traffic advisory, resolution advisory…"	Change to: "… Other, Proximate, Traffic Advisory, Resolution Advisory…". Also, use "Proximate" vs. "proximity" in the note.
87.	Mosher	22	2.2.2.5.1.2	S	This requirement cannot be validated, because "priority" is not defined.	Sections that follow define it
88.	Joel Wichgers	22	2.2.2.5.1.2.2	S	This section states the Traffic Output Priority for Systems Integrated with TCAS. It is not complete. I believe that it should be acceptable for a manufacturer to integrate with TCAS, and provide CD alerting for at a minimum the non-TCAS targets, and preferably all targets. For the first alternative, it is clear that the CD alerting will not impact TCAS alerting, as CD would not be done on	Clarify the title of §2.2.2.5.1.2.2: "Traffic Output Priority for Systems Integrated with TCAS <u>(without CD)</u>" Add new section: §2.2.2.5.1.2.3: "Traffic Output Priority for Systems Integrated with TCAS <u>and CD Alerting for non-TCAS Targets</u>". Incorporate a priority similar to §2.2.2.5.1.2.2, but add the CD alerts into the priority scheme. **DEFER TO NEXT VERSION OF MOPS**

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					TCAS targets. For the second alternative, CD could provide an additional layer of alerting in addition to TCAS alerting, although, pilot training could be an issue.	
89.	AIR-130	23	2.2.2.5.1.2.2	E	Don't need "for systems integrated with TCAS" in numbers 1 and 2. That's in the title of the req't.	Remove parenthetical portions of 1 and 2.
90.	Joel Wichgers	23	2.2.2.5.1.3	S	Item c is not written as a MOPS-like requirement (i.e., parameter period of time).	Change item "c" as follows: "c. Dropped track IDs **shall** not be reused for ~~a parameter period of time, nominally~~ at least 2 seconds. **DONE**
91.	Mosher	23	2.2.2.5.1.3	S	Need to define what "parameter period of time" means.	Made into 2 seconds
92.	Joel Wichgers	23	2.2.2.5.1.4	E	Editorial. Extra comma in the sentence.	Delete the double comma (i.e., ",,") in the first sentence.
93.	Honeywell	23	2.2.2.5.1.4	E	Extraneous comma in the first sentence	Remove one of them
94.	Sethu Rathinam	23	2.2.2.5.1.4 (and other places)	S	First phrase "For EVApp application and installations supporting selected traffic,," needs to be cleared up	Replace with "For installations supporting EVApp and/or traffic selection, " ACCEPT
95.	Terry Abbott	24	2.2.2.5.1.5	E	Section appears to be too limiting in scope.	Change text to "For applications installations supporting selected traffic…"
96.	R. Brandao	24	2.2.2.5.1.8 2.2.2.5.1.9	S	Recommend that the EVAPP application allow the use of ground speed or closure rate. Also DO-289 Appendix G 1.1.2 seems to indicate that the CDTI can	Merge section 2.2.5.1.8 and 2.2.5.1.9 and indicate that as a minimum the ASSAP shall provide at least ground speed OR closure rate. **GS is required and closure rate will be**

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					provide either speed <u>or</u> closure for this application. Other sections within Appendix G also indicate that either ground speed or closure are required but not both (e.g. See Table G-1).	**made optional**
97.		24	2.2.2.5.1.9	s	The section should allow Closure Rate or Differential Ground Speed. In many cases Differential Ground Speed is more useful that Closure Rate.	Describe and allow either for EVapp. **We accept—to be incorporated. Add assumption that ground speed is well approximated by the maginitude of the ground speed.**
98.	Terry Abbott	24	2.2.2.5.1.9	E	Section begins with an incomplete sentence.	Change text to "For the EVApp application and installations…." Actually prefer "For application and installations…."
99.	Joel Wichgers	25	2.2.2.5.1.9	SE	Item b is a poorly written requirement, that is not technically correct as written. How can someone compute a rate based upon a slant range? What was meant was that the closure rate should be computed along the direction of the slant range.	Change item b as follows: "b. Traffic Closure Rate **shall** be calculated ~~based on~~ <u>along</u> the <u>direction of the</u> slant range ~~from~~ <u>between the</u> own-ship position <u>and the traffic position</u>.
100.	Joel Wichgers	28	2.2.2.5.2.1	SE	Item a: The requirement wording is not clear. What does it mean to provide a latitude/longitude "based on" WGS-84. Either it is WGS-84 or it is not.	Change item "a" as follows: "a. The ASSAP function **shall** provide the Own-ship Horizontal Position ~~based on~~ <u>in</u> WGS-84 latitude/longitude to the CDTI. **ACCEPT**
101.	Edward Lester	28	2.2.2.5.2.1	S	The own-ship horizontal position can be an optional piece of data provided by the ASSAP function to the CDTI. Own-ship position is not needed if traffic is provided using relative range and bearing per	Add the following qualifier to the beginning of 2.2.2.5.2.1 a: "For the ASSA and FAROA applications or for CDTI installations that use Own-ship Horizontal Position, the ASSAP function shall provide the Own-ship

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					2.2.2.5.1.7 (b) and the ASSA or FAROA applications are not implemented.	Horizontal Position…" **We have it the way it is to discourage use of relative coordinate system on surface maps.**
102.	R. Brandao	28	2.2.2.5.2.1	S	This should be an optional requirement. The ASSAP does not need to be the providing of own ship information to the CDTI. In most air transport applications the CDTI (display) will have its own interface to the own ship position source(s) to support higher availability and integrity requirements (as required by the other navigation, etc functions the display may be supporting).	Add the following statement. "The ASSAP may not have to provide own ship position if the CDTI has a comparable source of own ship position" **We have provisioned for other sources to be provided to the display if they meet all the requirements. See section 3.1.8 installed requirements.**
103.	R. Brandao	28	2.2.2.5.2.2	S	Similar comment as for 2.2.2.5.2.1	Propose similar resolution as in comment on section 2.2.2.5.2.1 **Similar response to above comment.**
104.	Joel Wichgers	29	2.2.2.5.2.3	C	The ASSAP function does not know the track angle "error" (if we knew the error we would take it out). We can assess the track angle 95% uncertainty. As stated before, I do not concur with the guidance manufactures are suppose to follow in Appendix D for assessing the 95% uncertainty of track angle directionality.	I have three recommendations: 1) change item "b" as follows: "b. When own-ship track angle is to be used to orient the display, Own-ship Track Angle **shall** be considered invalid when the own-ship track angle ~~error~~ uncertainty (95% accuracy characterization) is greater than ±5 degrees. ~~See Appendix D for information on track angle errors.~~ 2) change item "c" as follows: "c. When own-ship track angle is to be used to orient the own-ship symbol, the Ownship

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						Track Angle **shall** be considered invalid when the own-ship track angle ~~error~~ uncertainty (95% accuracy characterization) is greater than ±30 degrees. ~~See Appendix D for information on track angle errors.~~" 3) Add a "one acceptable means" section defining one acceptable means to comply with determining whether the Own-ship Track Angle meets the ±5 degree and ±30 degree uncertainty requirements, analogous to that as I have defined in my proposed resolution previously for Traffic Track Angle uncertainty, however, leave it more general to allow a manufacturer to utilize the velocity figures of merit that may be output by future GNSS receivers (i.e., do not use characterize based upon NACv).
105.	Mosher	29	2.2.2.5.2.3.b	S	Track angle error cannot be determined by the ownship equipment.	OBE
106.	Mosher	29	2.2.2.5.2.3.c	S	Ownship track angle error cannot be determined by the ownship equipment.	OBE
107.	Joel Wichgers	29	2.2.2.5.2.5	E	Editorial.	If the CDTI requires Length/Width codes, …
108.	AIR-130	29	2.2.2.5.2.5	E	Current text: If CDTI *requires* Length/Width codes…	Change "requires" to "uses".
109.	Mosher	29	2.2.2.5.3.1	S	If the ASA Application Status is required to be reported for each application, then this should be made clear in the text.	In the second paragraph, replace the word "the" immediately before "ASA Application" with the word "each." Likewise, in the third

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						paragraph, replace "The" with "Each" as the first word. ACCEPTED
110.	R. Brandao	29	2.2.2.5.3.1	S	The requirements in this section is too detailed. It seems to have information supporting a particular implementation philosophy. This kind of information is normally left for interface characteristics such as ARINC or up the equipment manufacturer. For example not all designs may want to convey to the CDTI why an application is not available.	Add the following as a new paragraph #2. "At a minimum the ASA Application Status shall indicate whether the ASA Application(s) is(are) functional or not functional. The status information may be provided for an a grouping of applications or for each individual application." Delete the rest of the section. **Need input from CDTI group on whether they use all these states in the MOPS**
111.		30	2.2.2.5.3.1	e	NCD	Define
112.	Joel Wichgers	30	2.2.2.6	S	Missing ADS-B traffic, the requirement should also apply to ADS-B traffic, and not just ADS-R and TIS-B traffic. Furthermore, Appendix J as written is not ready for a "green cover" MOPS. It looks like a working paper from Don Walker was slapped in an Appendix. This appendix needs to be deleted or re-written into MOPS-like language. If it is re-written, it needs to be corrected in several areas.	Recommendations: 1) ASSAP **shall** receive ADS-B, ADS-R, and ~~&~~ TIS-B reports from the input interface and output correlated tracks to the CDTI within 2.0 seconds. 2) Note 2 should be deleted (if appendix J is deleted), or re-written as: *"~~The~~ Rational for the 2 second requirement is ~~derived~~ given in Appendix J.* *ACCEPT/DONE*
113.	R. Brandao	30	2.2.2.6	C	This section implies that the processing of	Include a statement in Chapter 1 (perhaps in

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					TIS-B and ADS-R are a minimum requirement. If it is a minimum requirement to process ADS-R and/or TIS-B then it should also be a minimum requirement to disable these applications in areas where ADS-R and TIS-B services are not available. The MOPS currently defines situational awareness applications for which high ADS-B out equipage rates are not required. Therefore, it follows, that ADS-R and TIS-B utilization should not be part of the minimum requirement. As a manufacturer, Honeywell finds it difficult to accept a minimum requirement for something that cannot yet be tested operationally – not just in the lab. 1090 TIS-B and ADS-R services do not exist or will soon be available at a very few limited locations. Honeywell fully supports the ADS-R and TIS-B services and plans to use them in future products when they can be appropriately flight tested and evaluated and when availability of these services is sufficient. Therefore, it is very important to have good requirements for the use, processing, and display of TIS-B and	the assumptions section) or in Section 2.2.2 that states the following: "Although desireable and recommended the processing and use of ADS-R and TIS-B message is an optional requirement for the applications defined in this MOPS". **AIR position is that ADS-R is required but TIS-B is optional for TCAS installations for airborne targets**

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					ADS-R. As such Honeywell recommends that the requirements for processing TIS-B and ADS-R be defined as optional.	
114.	AIR-130	30	2.2.3	C	**Data Fusion** If data fusion is optional there needs to be requirements defined. Currently data fusion is optional, however the requirements for fusion are deferred until the next version.	Either define the requirements for fusion, or disallow fusion. **Incorporate Chips Changes**
115.	Joel Wichgers	32	2.2.3.1.1	SE	The requirements in this section need to be written in a simpler and clearer manner. An aircraft can determine whether or not it is "on ground" or "airborne", but cannot necessarily determine that is on an airport surface (without an airport surface map, which is not a minimum requirement).	The recommendation below (clarifies) but does not change the proposed requirements. "… ASSAP **shall** begin the track initiation process for: a. ADS-B and ADS-R reports, regardless of address type. b. TIS-B reports received ~~in an ownship~~ when own-ship is on the ~~surface~~ ground. c. TIS-B reports received ~~in an~~ for airborne aircraft, when own-ship is airborne and ~~that~~ is not TCAS equipped. d. TIS-B reports received ~~on~~ for surface A/Vs, ~~in an~~ when own-ship is airborne and ~~ownship that~~ is TCAS equipped. **ACCEPT**
116.	Mosher	32	2.2.3.1.1.b	S	It's not clear what "...received in an ownship" means. Define what "received	reworded

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					in an ownship" means; otherwise, this requirement cannot be validated.	
117.	Mosher	32	2.2.3.1.1.c	S	It's not clear what "...received in an airborne ownship" means.	reworded
118.	Mosher	32	2.2.3.1.1.d	E	Replace "on" with "for" ?	reworded
119.	Mosher	32	2.2.3.1.2.a	S	Define what "priority" means; otherwise, this requirement cannot be validated.	Covered in subsections of track priority
120.	Mosher	32	2.2.3.1.2.b	S	Define "priority" – otherwise, this requirement cannot be validated.	Same as above
121.	Joel Wichgers	33	2.2.3.1.3.	C	The Report Validity Tests as proposed in this MOPS are not complete, comprehensive, nor are testable requirements as written. For example, how can a manufacturer test to a parameter multiple of HEPU. Is the parameter 1, 2, 10, or 1 million? The Report Validity Tests as included in this MOPS are only example tests.	Change this section as follows: "For each report containing an updated position and/or velocity, and where there is an existing track with the same source and participant address, ASSAP **shall** update that track with the report only when it passes ~~the~~ <u>manufacturer specified report validity tests.</u> <u>Example</u> Report Validity tests given in Section 2.2.3.1.3.1.
122.	Joel Wichgers	33	2.2.3.1.3.1	C	The Report Validity Tests as proposed in this MOPS are not specified in a complete, comprehensive, nor testable manner as written. They are example tests at best. For example, how can a manufacturer test that the horizontal distance between the report being validated and the extrapolated track position is less than the	Rename this section "<u>Example</u> Report Validity Tests". Add the following sentence: "This section contains example report validity tests."

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					sum of a multiple of HEPU and the horizontal uncertainty estimates reflecting track extrapolation. Is the parameter 1, 2, 10, or 1 million? The Report Validity Tests as included in this MOPS are only example tests.	
123.	Mosher	33	2.2.3.1.3.1	S	Clarify whether or not passing all tests defined in ..1.3.1 is required to update a track.	OBE
124.	Mosher	33	2.2.3.1.3.1.a.1	S	Does "A multiple..." mean to multipy the 1. and 2. factors together? Need clarification.	OBE
125.	Mosher	33	2.2.3.1.3.1.b	S	What does “a parameter amount” mean? Clarify.	OBE
126.	Mosher	33	2.2.3.1.3.1.b.1 2.2.3.1.3.1.b.2	S	Define "average ground speed". Over what interval is the ground speed to be averaged?	OBE
127.	Mosher	33	2.2.3.1.3.1.c.1	S	What “multiple” is appropriate?	OBE
128.	Mosher	33	2.2.3.1.3.1.d	S	Define "a parameter amount".	OBE
129.	Joel Wichgers	34	2.2.3.1.3.2	C	Critical: Do not site the example report validity tests as if they are required. Substantive: Items “a” and “b” have circular requirement that are not clear. This section is defining the “duplicate address processing requirements” and	Change this section as follows: “ADS-B reports received on UAT which do not pass the Report Validity ~~Tests given in Section 2.2.3.1.3.1~~ Testing as required for Track Maintenance as specified in Section 2.2.3.1.3 are subject to further processing ~~on UAT systems~~ to determine if they are the

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					requirements "a" and "b" state that ASSAP shall do something when no track is created as a result of duplicate address processing. I have tried to clarify this with my proposed resolution.	result of a duplicate address as specified below: a. For ADS-B reports received from UAT for which there is no track already created as a result of this duplicate address processing with a matching participant address and ADS-B source, ASSAP **shall** begin the track initiation process. b. For each report containing an updated position and/or velocity, and where there is an existing track created as a result of previous duplicate address processing with the same participant address, ASSAP **shall** ~~update that track~~ perform track maintenance with the report only when it passes the Report Validity ~~Tests given in Section 2.2.3.1.3.1~~ Testing for the duplicate track as specified in 2.2.3.1.3."
130.	Mosher	34	2.2.3.1.3.2	S	Why does this requirement apply to only UAT systems? No data link is immune to the problem of mis-configured ICAO addresses.	**For 1090, the duplicate report should never leave the receiver per the "reasonableness check" requirement.**
131.	Mosher	34	2.2.3.2	S	This section should clearly state whether TIS-B reports should be output to the CDTI while the correlation process is ongoing.	We need to address this **Should be covered by Dans update**
132.	AIR-130	34	2.2.3.2	S	**Decorrelation and Miscorrelation Requirements**	Add requirements to section 2.2.3.2 for miscorrelation and decorrelation.

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					- Section 2.2.3.2 covers correlation requirements, but not miscorrelation and decorrelation requirements. - Section 3.4.2.2 and Appendix C both address miscorrelation and decorrelation, however there needs to be requirements in section 2.	**OBE**
133.	Joel Wichgers	35	2.2.3.2.1	C	There is a requirements inconsistency. This section states that inter source correlation requires address matching, but not spatial correlation. Section 2.2.3.2.1.2 says, "if the following conditions hold … then you **shall** attempt spatial correlation. There is no notion of "not required" in that subsequent section. Furthermore, it needs to be much clearer that Spatial Correlation is not required. The words used stumble over themselves with too many uses of the word "required".	Change the second and third paragraphs as follows: "The second (more common) case is where the TIS-B track address has been assigned by the TIS-B service provider, and thus an address match with the ADS-B/ADS-R track is not possible. In this second case, a ~~correlation~~ technique ~~must~~ can be applied to recognize correlated targets that uses other track characteristics such as position and position history. Such~~; such~~ a technique is termed a "spatial" correlation method. ~~, but n~~Non-positional track information such a velocity or call-sign (if provided) may be used as well as part of the spatial correlation method. ~~This technique requires~~ To perform both the spatial correlation and address matching techniques, additional processing is necessary over just performing the ~~an~~ address match technique.~~, and~~ It is not ~~required~~ a requirement of this MOPS to perform the spatial correlation

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						technique, since the presence of both TIS-B and ADS-B/ ADS-R tracks for the same A/V should be relatively rare. Requirements for ~~these two correlation techniques~~ the first correlation technique (Address Match) and guidance for the optional second technique (Spatial Correlation) are given in the following subsections.
134.	AIR-130	35	2.2.3.2.1	C	**TIS-B & ADS-B Correlation Requirements** - The second paragraph indicates that inter-source correlation between TIS-B and ADS-B is not required since the presence of both TIS-B and ADS-B tracks for the same A/V should be rare. - However, because the Ground system will send TIS-B messages on DO-260 targets there will be extensive track overlap between ADS-B and TIS-B, necessitating correlation.	Inter-source Spatial correlation between TIS-B and ADS-B must be a requirement. **Might resolve with ITT to ensure no TIS-B on 1090 v0**
135.	Joel Wichgers	35	2.2.3.2.1.1	C	The Correlation Window Tests as proposed in this MOPS are not specified in a complete, comprehensive, nor testable manner as written. They are example tests at best. For example, how can a manufacturer test the Horizontal Correlation Window with	Change this section as follows: "If TIS-B and ADS-B/ADS-R tracks both have ICAO addresses, then ASSAP **shall** correlate the two tracks if they have matching addresses and each TIS-B track update passes ~~the~~ manufacturer specified Correlation Window Tests ~~given in Section 2.2.3.2.1.3~~ when referenced to the ADS-B/ADS-R track..

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					"a multiple of the various quantities." Furthermore, I do not believe that simply adding "multiples" of the standard deviations is the correct statistical answer to determine the size of a correlation window. Furthermore, there are no limits as to when to apply this correlation window (e.g., not for surface A/Vs). These tests are examples at best.	Example Correlation Window Tests are given in Section 2.2.3.2.1.3."
136.	Joel Wichgers	35	2.2.3.2.1.2	C	This entire section is optional and a MOPS complaint function may perform this additional testing as indicated in §2.2.3.2.1. Remove all "shall's" from this section, and clearly indicate that this is optional.	Change this section as follows: 1) "Optional Correlation Test -- Inter-Source Correlation of TIS-B with ADS-B/ADS-R Tracks Using Spatial Correlation" 2) Add the following first sentence. "This section contains information describing an optional (i.e., not required) correlation test that may be utilized to identify conditions where a TIS-B track is provided, even when an ADS-B / ADS-R track is also available." 3) Delete all the instances of "shall" in this section. Change the first "shall" to "may", the second "shall" to "should". 4) Change the sentences below item "d": " … then correlation between these tracks ~~shall~~ may be attempted using a process which

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						applies, ~~at a minimum, the~~ Correlation Window Tests ~~given in Section 2.2.3.2.1.3~~ to each TIS-B track update. Example Correlation Window Tests are given in Section 2.2.3.2.1.3. This process ~~**shall**~~ should establish the correct correlation within three TIS-B track updates …" 5) The three test conditions are not clear an unambiguous. They need to be much better defined.
137.	Mosher	35	2.2.3.2.1.2	E	Test procedures should not be mixed in with the requirements text.	
138.	AIR-130	35	2.2.3.2.1.2	C	**TIS-B & ADS-B Correlation Requirements** - See last comment on 2.2.3.2.1 regarding requiring TIS-B/ADS-B correlation because of the DO-260 issue. - Remove condition "a." Correlating TIS-B and ADS-B needs to be a requirement because of DO-260 targets being transmitted by TIS-B	Remove condition "a." **Might resolve with ITT to ensure no TIS-B on 1090 v0**
139.	Honeywell	35	2.2.3.2.1.2	S	Are both tracks required to be airborne?	If so, add condition or Note **being rewritten**
140.	Honeywell	35	2.2.3.2.1.2	S	Instead of calling these "test conditions", why not call them "scenarios"? This removes the confusion as to whether these are tests that belong in the test section of the document.	OBE

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141.	Honeywell	35	2.2.3.2.1.2	C	The performance desired in this section is not clear enough. These requirements need to be matured.	ACCEPT
142.	Mosher	35	2.2.3.2.1.2.2	E	Please provide an illustration of the converging scenario.	
143.	Mosher	36	2.2.3.2.1.2.3	E	Please provide an illustration.	
144.	Joel Wichgers	36	2.2.3.2.1.3	C	The Correlation Window Tests as proposed in this MOPS are not complete, comprehensive, nor are testable requirements as written for inter-source correlation. They are example tests at best. For example, how can a manufacturer test the Horizontal Correlation Window with adding "multiples" of the various quantities." What multiple should we multiply by, e.g., 1, 2, 10, 100, a million? Furthermore, I do not believe that simply adding "multiples" of the standard deviations is the correct statistical answer to determine the size of a correlation window. Furthermore, there are no limits as to when to apply this correlation window (e.g., not for surface A/Vs). These tests are examples at best.	Change this section as follows: **"<u>Example</u> Correlation Window Tests for Inter-Source Correlation of TIS-B with ADS-B/ADS-R Tracks** The following <u>example</u> Correlation Window Tests are defined for the inter-source correlation of TIS-B with ADS-B/ADS-R tracks, with the ADS-B/ADS-R track extrapolated to the time of the TIS-B track update: …"

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145.	Honeywell	36	2.2.3.2.1.3	C	The performance desired in this section is not clear enough. These requirements need to be matured.	ACCEPT
146.	Mosher	36	2.2.3.2.1.3.a.1 2.2.3.2.1.3.a.2 2.2.3.2.1.2.b.1 2.2.3.2.1.2.b.2	S	Define the multiplier (comment applies throughout this section).	OBE
147.	Mosher	37	2.2.3.2.2.1	S	Define the exact parameter value, or an algorithm for determining it.	OBE
148.	Honeywell	37	2.2.3.2.2.1	S	There might be a hole in the requirement for spatial correlation. What if ownship and another aircraft have the same ICAO address and they are separated by more than 1 NM or 500ft, then the other aircraft closes on ownship? The other aircraft will be tracked until it moves "within a parameter" of the ownship at which point it will be correlated and no longer displayed. Is this what was intended?	Add criterion regarding previously established track. Should there be a note about looking at HFOM/VFOM to determine "parameters"? OBE—will be covered by miscorrelation performance requriements
149.	Honeywell	37	2.2.3.2.2.1 2.2.3.2.2.2 2.2.3.2.2.3	C	The performance desired in this section is not clear enough. These requirements need to be matured.	ACCEPT
150.	Joel Wichgers	37	2.2.3.2.2.2	C	The inter-source Correlation Window Tests as proposed in this MOPS are not complete, comprehensive, nor are testable	Indicate that these are example tests similar to my previous recommendations. Eliminate all "shall's" in this section for these example tests.

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					requirements as written for inter-source correlation. They are example tests at best.	
151.	Honeywell	37	2.2.3.2.2.2	S	Instead of calling these "test conditions", why not call them "scenarios"? This removes the confusion as to whether these are tests that belong in the test section of the document.	OBE
152.	Joel Wichgers	37	2.2.3.2.2.3	C	The Correlation Window Tests as proposed in this MOPS are not complete, comprehensive, nor are testable requirements as written for inter-source correlation of TIS-B tracks with own-ship position. They are example tests at best.	Indicate that these are example tests similar to my previous recommendations. Eliminate all "shall's" in this section for these example tests.
153.	Mosher	37, 38	2.2.3.2.2.3. a.1 2.2.3.2.2.3. a.2 2.2.3.2.2.3. b.1 2.2.3.2.2.3. b.2	S	Again, define the multiple.	OBE
154.	Mosher	38	2.2.3.2.2.3. c	S	Define the parameter.	OBE
155.	AIR-130	38	2.2.3.2.3	S	Change the second paragraph of 2.2.3.2.3 to discourage utilization of TIS-B information on airborne targets in TCAS equipped aircraft	Spatial correlation of airborne TIS-B tracks with TCAS is not required and is discouraged. TCAS equipped aircraft should disregard TIS-B reports on airborne targets. If TIS-B is incorporated in airborne integrations that

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						include TCAS all correlation requirements must be met. On installations not supporting this correlation, airborne TIS-B tracks are terminated on the ownship departure and the initiation of new airborne tracks is inhibited, and thus no TCAS and TIS-B correlation will occur in these systems. DONE
156.	Honeywell	38	2.2.3.2.3.1	C	The performance desired in this section is not clear enough. These requirements need to be matured.	ACCEPT
157.	Joel Wichgers	38 - 39	2.2.3.2.3.1	C	The Tests as proposed in this section are not complete, comprehensive, nor are testable requirements as written. They are example tests at best. A 0.25 feet (1/4 foot) error tolerance is way too tight.	Indicate that these are example tests similar to my previous recommendations. Eliminate all "shall's" in this section for these example tests.
158.	Maynard	38, 39	2.2.3.2.3.1. a.1 2.2.3.2.3.1. a.2 2.2.3.2.3.1. b.1 2.2.3.2.3.1. b.2	S	Specify the multiple.	OBE

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159.	Honeywell	39	2.2.3.2.3.1.b.1 2.2.3.2.3.3.b.1	S	What is the reasoning behind a 25 ft altitude error for TCAS? TCAS uses either a 25-ft tracker or a 100-ft tracker dependent on the transponder reply. Was the 100-ft tracker considered here?	OBE—being rewritten
160.	Joel Wichgers	39	2.2.3.2.3.2	C	The Tests as proposed in this section are not complete, comprehensive, nor are testable requirements as written. They are example tests at best.	Indicate that these are example tests similar to my previous recommendations. Eliminate all "shall's" in this section for these example tests.
161.	Honeywell	39	2.2.3.2.3.2	E	This section references 2.2.3.2.2.3. Should the reference be 2.2.3.2.3.3?	Change if necessary OBE
162.	Joel Wichgers	39	2.2.3.2.3.3	C	The Tests as proposed in this section are not complete, comprehensive, nor are testable requirements as written. They are example tests at best. A 0.25 feet (1/4 foot) error tolerance is way too tight.	Indicate that these are example tests similar to my previous recommendations. Eliminate all "shall's" in this section for these example tests.
163.	Honeywell	39	2.2.3.2.3.3	C	The performance desired in this section is not clear enough. These requirements need to be matured.	ACCEPT
164.	Maynard		2.2.3.2.3.3.b.1 2.2.3.2.3.3.b.2	S	Specify the multiple.	OBE
165.	Mosher	40	2.2.3.3	S	In the last paragraph on page 40: to "prevent periodic interruptions" of what? This paragraph doesn't clearly define the conditions in which a data source may be	clarified

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					excluded.	
166.	Mosher	41	2.2.3.4.b	S	Subparagraph b. is nonsense. If the aircraft is not supporting the processing of TIS-B reports, then the TIS-B track would never have been acquired. Re-word this paragraph to reveal what it's trying to say.	deleted
167.	Joel Wichgers	41	2.2.3.5	C	There are two critical pieces missing in these requirements: 1) It is required to not only extrapolate all the traffic tracks to a common time within +/- 200 msec, but also one must extrapolate own-ship position to the same common time. 2) The common time cannot be just any common time (like 10 seconds ago), since the flight crew needs to be able to correlate the display with the outside world. Therefore, <u>the common time that the tracks need to be extrapolated to is the time when they may be displayed on the CDTI</u>. These two additional requirements are necessary to maintain the correct relative bearing between own-ship and traffic and correlation of the display with the out the window view.	Add the following requirements after the first paragraph: "The own-ship state information **shall** be estimated to the same common time of applicability as the traffic tracks. The common time of applicability **shall** be within +/- 500 msec of when the own-ship and traffic targets may be displayed to the flight crew on the CDTI."
168.	Mosher	41	2.2.3.5	E	The requirement in the second paragraph has nothing to do with common time of track estimation. This probably belongs in	

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					another section, or in its own paragraph.	
169.	Joel Wichgers	42	2.2.4 Figure 2-4	E	Editorial.	Correct the figure labels all throughout the Figure.
170.		43	Table 2-1	c	The table will only allow NACp of 8 for ASSA/FAROA on the surface for a degraded symbol. This is a situational awareness only application and for a degraded symbol. Almost all implementations of ADS-B out will be with GPS or better and NACp of 7 will be perfectly acceptable for situational awareness with a degraded symbol. For those rare occasions for non GPS solutions the crew will find it acceptable for a degraded symbol to be out of position. The benefits of having more vehicles displayed for situational awareness to prevent a surface collision well outweigh the training of crews so they understand why an occasional degraded symbol is not close to its real position.	Change degraded symbol for ASSA/FAROA (surface) from 8 to 7. **ACCEPTED—to be incorporated**
171.	R. Brandao	43	Table 2-1	S	The ASSA/FAROA the Horizontal Position Accuracy and Degraded Position Accuracy is not listed consistently between NAC and meters NACp 9 is equivalent to 30 meters and NACp 8 is equivalent to 92.6 meters and NACp 7 is equivalent to 185.2 meters. It is not clear	**We have fixed this**

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					from the table which of these values was intended.	
172.	Joel Wichgers	43	2.2.4 Table 2-1	C	The Maximum Latency requirements between interface A1 and B1 are not sufficient and are consistent with existing equipment standards. This needs to be extended back to 1 second as defined in Table 2-2 of the ASA MASPS (DO-289). The 0.600 msec is not compatible with the 0.700 msec A1 to B1 latency requirements for GPS/WAAS sensors (per RTCA/DO-229D sections 2.1.2.6.2 and 2.1.3.6.2) and GPS/LAAS sensors (RTCA/DO-253B – section 2.3.10.4). These GPS sensors allow 0.500 msec latency from TOM to TOA and 0.200 msec from TOA to output (which in total is the definition of A1 to B1 per the ASA MASPS). In addition, some real aircraft architectures have data concentrators between the GPS sensor and other avionics (like ASSAP or transponder), which adds additional latency. The 1.0 second allocation is consistent with the MASPS and the existing GPS standards. Furthermore, under a similar argument, the outputs of FMS systems on some real aircraft architectures have data	Recommendations: 1) Change the A1 -> B1 maximum latency from 0.6 sec to 1.0 sec. Then, you will need to update the A1 -> G to 5.1 seconds. 2) Appropriately correct Appendix J or delete it. It is not correct on where A1 to B1 resides, and does not allow time for data concentrators. Furthermore, Appendix J as written is not ready for a "green cover" MOPS. It looks like a working paper from Don Walker was slapped into an Appendix. This appendix needs to be re-written into MOPS-like language, and technically corrected in several areas. 3) Latency allocation between D->E is inconsistent with the ADS-B MASPS (DO-242A,Table K-1), as well as the ASA MASPS (DO-289). If we retain this relaxed value, then we need an action plan to reflect that in DO-242A and the link MOPS, as well as DO-289.

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					concentrators between the FMS output and the other avionics. 0.600 sec is not sufficient. Change the number back to the ASA MASPS number of 1 second between A1 and B1. Appendix J which describes the rationale is not complete, and should either be updated or deleted. Furthermore, the D->E interface Maximum Latency Allocation does not follow the allocation in the ADS-B MASPS (DO-242A), which allocates 0.3 seconds. I am personally OK going from 0.3 to 0.5 seconds, but wonder if we have an action plan to update DO-242A.	
173.	Joel Wichgers	43	2.2.4 Table 2-1	E	Editorial.	For ASSA/FAROA, the 92.6 meters is a NACp of 8 (not 9), and the 185.2 m is a NACp of 7 (not 8).
174.	D. Miller	43	2.2.4	S	In Table 2-1 change ASSA/FAROA Horizontal Position Accuracy value from 92.6 to 30 meters	
175.	D. Miller	43	2.2.4	S	In Table 2-1 change ASSA/FAROA Degraded Position Accuracy value from 185.2 to 92.6 meters	
176.	AIR-130	44	Table 2-1	S	Note 7 indicates that Conflict Detection Horizontal Velocity Accuracy should be "*determined during installation*	Change "installation approval" to "design approval" DONE

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					approval." Shouldn't this read "determined during design approval"	
177.	Joel Wichgers	44	2.2.4 Table 2-1	C	Note 3 is not correct and must be deleted!!!! NACp characterizes the position sensor measurement accuracy performance, and does not in any way characterize the uncertainty region about the reported position after a latency period. That is not the definition of NACp. Any notion that the NACp must be extrapolated to a different value at a later latency period is not aligned with the definition of the parameter, and must be removed from the document.	Delete Note 3 which states: "~~*3. In some limiting cases with high maneuver rates, the error might exceed NACp of 5 for several seconds at the end of the Maximum Data Age period.*~~"
178.	R. Brandao	44	Table 2-2	S	The Maximum Horizontal Position accuracy for ASSA/FOROA is listed as 74 meters. It should be made clear that this is the requirement for the own position source to display a moving map. However, the own position accuracy if worse to ASSAP does not preclude ASSAP from providing sufficiently accurate traffic position information to the CDTI.	See proposed resolution to comment on section 2.2.4.2.1 **Dealt with under another comment**
179.	Joel Wichgers	45	2.2.4 Table 2-2	C	This summary table conflicts with the requirements of §2.2.4.2.1.	For ASSA/FAROA vertical position accuracy

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					ASSA/FAROA are applications that are potentially run during the final stages of a precision approach, and not just when the aircraft is on the surface. The ASSA/FAROA "vertical position accuracy" is not correct. While an aircraft is on the final stages of an approach, the surface traffic should appear on the CDTI according to the ASSA/FAROA display criteria. In order to enable this ASSA/FAROA display of surface traffic while own-ship is airborne, the vertical position accuracy needs "valid Baro" or "Valid Geo."	row, replace "On Ground Status (Note 4) with "On Ground Status (while on Surface) and Valid Baro or Valid Geo (while airborne) [Notes 3 and 4]". **ACCEPTED**
180.	Joel Wichgers	45	2.2.4 Table 2-2	E	Editorial.	Consistently use "N/A" (for not-applicable) rather than NA. This will then be consistent with Appendix A.
181.	Joel Wichgers	45	2.2.4 Table 2-2	C	The proposed requirements are not consistent with DO-257A. The chairman of the working group who led the development of RTCA DO-257A (Aerodrome Moving Map Display) requirements disagrees with the proposal to change the allocation to the own-ship horizontal position accuracy. We discussed the proposal, and agreed that it is not valid to "de-RSS" the error sources and re-allocate error from the map to the	Change the requirement for ASSA/FAROA "Max Horizontal Position Accuracy" row from 74 meters to 36 meters, and delete note 1. This recommended change is consistent with RTCA DO-257A requirements. Our special committee does not have the authority to change their requirements. We are simply displaying traffic on an Aerodrome Moving Map Display, which has been defined by the requirements in DO-257A.

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					own-ship position. There is a fundamental difference between a position bias that is noted, the map provider is told about it, and he corrects the airport mapping in the next release of the database, versus a significantly larger random error source that is always present that is caused by own-ship position uncertainties. Root sum squaring (RSS) only works when the error sources are Gaussian, or when there are very many error sources, where no individual error source dominates.	
182.	Mosher	45	2.2.4	S	In Table 2-2, row 6 ("Horizontal Position Integrity Containment Region"), column 7 ("EV Approach" application): 0.5 NM does not map to a defined NIC value. To reduce confusion, change this to a value nearest an appropriate NIC value.	Changed to 0.6
183.	Joel Wichgers	46	2.2.4.1.2	SE	This document says that "All existing ADS-B links are capable of producing EVAcq traffic." This is not complete. If I designed to this requirement, I would specifically exclude data on future link versions.	Change the sentence to read: "All existing versions of the 1090ES and UAT ADS-B links are capable of producing EVAcq traffic, and all future versions willare expected be developed to be capable of producing EVAcq traffic." ACCEPT with edit

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184.	Joel Wichgers	46	2.2.4.1.2	C	I fundamentally disagree that the EVAcq requirements of 0.5NM accuracy should be the threshold applied to all traffic targets, including those that are outside the 10 NM EVAcq application range. The 0.5 NM was used as a simple threshold, but in fact the ASA MASPS analysis for EVAcq showed that a 95% error of 30 degrees was acceptable (see Table C-2 in DO-289). 30 degrees is only 1 clock position. A 0.5 NM error in the "worst case" (with all the error in the cross track direction), when the traffic is at 10 NM from own-ship, only causes a 2.86 degree error. This is less than 1/2 a "second" angular difference on an old analog clock with hands. Doubling the error to 1 NM, even with the worst case all cross track error assumption) causes about a 5.7 degree error (which is less than 1 second of error). Clearly, the 0.5 NM is over specified for the EVAcq application, but it was a simple threshold that could be used throughout the 10 NM range of the application (to include aircraft very close	The EVAcq traffic display criteria should only be required out to the EVAcq application range of 10 NM. 10 NM is the maximum range of any of the defined applications, and thus manufactures should be free to implement other criteria for assessing the suitability of displaying traffic targets outside this range. For example, some manufactures may be implementing other applications (e.g., oceanic passing and spacing in-trail procedure) and may want to be aware of traffic outside of 10 NM but not want them to be pulled from their CDTI if they have a 1 NM error. A 0.5 NM threshold is not universally acceptable threshold for traffic outside of 10 NM. Thus, I recommend: 1) Specifically state that "Manufactures are free to select appropriate thresholds for traffic outside of 10 NM commensurate with having less than or equal to 30 degree bearing uncertainty (95%)." 2) Change the second paragraph as follows: "<u>EVAcq traffic is defined as traffic within 10 NM of own-ship.</u> An EVAcq traffic **shall** be derived from a track with valid horizontal position. ~~A traffic track~~<u>EVAcq traffic</u> with NACp less than 5 **shall** be dropped from the

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					to own-ship). Outside of the 10 NM, manufacturers should be free to establish acceptable traffic display criteria, as it is not used for any of the ASA MASPS defined applications. A manufacturer may want to optionally implement other applications outside of 10 NM (like In-trail procedure), and "removing" aircraft from the display may not be appropriate.	CDTI interface."
185.	Joel Wichgers	46	2.2.4.1.2	S	It is not technically correct to say that the track's position was not updated. The track position is updated, such that all tracks are time aligned. It is the data age since the last received position update that is important.	Change the 3rd paragraph: "If an EVAcq track's ~~position is not updated within~~ data age exceeds 25 seconds, ASSAP **shall** drop the …" ACCEPT
186.	Mosher	46	2.2.4.1.2	E	In the second paragraph, second sentence: "Dropped" is probably not the best term. Maybe "shall not be provided to the CDTI interface" would be better.	Change the second sentence of the second paragraph to read, "A traffic track with NACp less than 5 **shall** not be provided to the CDTI interface."
187.	Mosher	46	2.2.4.1.2	E	In the fourth paragraph, first sentence: "drop" is sloppy terminology.	In the fourth paragraph, first sentence, replace "drop" with "remove."
188.	Terry Abbott	46	2.2.4.1.2	E	ADS-B does not produce traffic.	Change "All versions of existing ADS-B links are capable of producing EVAcq traffic" to "All versions of existing ADS-B links are capable of producing EVAcq traffic data."
189.	Joel Wichgers	47	2.2.4.1.2	S	This document says that "All existing ADS-B links are capable of producing ASSA/FAROA traffic."	Change the sentence to read: "All existing versions of the 1090ES and UAT ADS-B links are capable of producing ASSA/FAROA traffic ~~(e.g., DO-260 Version~~

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					This is not complete. If I designed to this requirement, I would specifically exclude data on future link versions.	~~0)~~, and all future versions will be developed to be capable of producing ASSA/FAROA traffic."
190.	Joel Wichgers	47	2.2.4.1.2	E	It is stated in the first paragraph that ASSA/FAROA paragraphs b through d address AIRBORNE traffic and e through h address on ground. That is not true. Item "c" addresses a ground requirement.	These requirements should be re-written in a much clearer form as described above.
191.	Joel Wichgers	47-48	2.2.4.1.2	S	I think that the ASSA/FAROA requirements would be much easier to understand if they were presented in a simpler manner. I also proposed changes in this replacement that fixed the approximately 6 additional problems that I have identified with this section below.	Replace the entire section with the following" All existing versions of the 1090ES and UAT ADS-B links are capable of producing ASSA/FAROA traffic, and all future versions will be developed to be capable of producing ASSA/FAROA traffic. a. ASSAP shall mark AIRBORNE traffic tracks valid for ASSA/FAROA when all of the following conditions are true: ➢ valid horizontal position ➢ NACp ≥ 5 ➢ valid vertical position determined as either valid pressure altitude or valid geometric position ➢ data age ≤ 25 seconds b. ASSAP shall mark ON GROUND traffic tracks valid for ASSA/FAROA when all of the following conditions are true:

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						➢ valid horizontal position ➢ NACp ≥ 8 ➢ aircraft that is reporting ON GROUND or reporting AIRBORNE but passes the on ground tests specified in section TBD ➢ data age ≤ 11 seconds for traffic in motion, or data age ≤ 25 seconds for traffic that is not in motion **Provisionally accept but want to clarify and keep the 45m. Don will get to editorial team. This will cover item 53 also**
192.	Joel Wichgers	48	2.2.4.1.2	S	Item c: If you are really relaxing the ASSA/FAROA requirements to a NACp of 8 such that it can be displayed with current GPS sensors, instead of the more pure application needs of NACp of 9 per the ASA MASPS analysis, why not for airborne targets just use baro validity or geometric validity, rather than requiring GPS to have a VFOM to support NACp of 9. Very few GPS sensors output VFOM, except when they are providing approach guidance.	Change the requirement to be in air: Valid baro or valid Geo. ACCEPT
193.	Joel Wichgers	48	2.2.4.1.2	S	Item d: I assume that you meant to have consistent requirements with the table, and NACp be 8 or greater (92.6 m), not NACp of 9.	Preferably take my recommendation previously for re-writing this entire section. If not, change item "d" as follows: "d. A surface traffic track **shall** have a ~~NACp of 9 or greater (30 m)~~ NACp of 8 or greater

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						(92.6 m) to be marked a valid ASSA/FAROA traffic on the CDTI interface." DONE
194.	Joel Wichgers	48	2.2.4.1.2	C	Items e and f use the term "updated" where traffic position must be "updated" within 11 or 25 seconds for moving or stationary traffic. "Updated" is not correct. The correct requirement is "data age". The track gets updated to a new position whether or not a new position message was received.	Preferably take my recommendation previously for re-writing this entire section. If not, change items "e" and "f" as follows: "e. If an ASSA/FAROA traffic is in motion, the traffic position must ~~be updated within~~ have a data age less than or equal to 11 seconds, …" f. If an ASSA/FAROA traffic is not in motion, the traffic position must ~~be updated within~~ have a data age less than or equal to 25 seconds, …" **TO BE INCORPORATED**
195.	Joel Wichgers	48	2.2.4.1.2	C	I disagree with the following statement in item "e": "*A manufacturer is encouraged to use shorter intervals for ADS-B and ADS-R traffic.*" The manufacturer is "encouraged" to drop real traffic that are out there off the screen sooner. How much sooner? Why is that safe to remove traffic that are really out there sooner?	Preferably take my recommendation previously for re-writing this entire section. If not, delete the following statement in item "e": "~~A manufacturer is encouraged to use shorter intervals for ADS-B and ADS-R traffic.~~" **DELETED**
196.	Joel Wichgers	47	2.2.4.2.1	S	Why aren't the ASSA/FAROA vertical requirements satisfied when either Pressure Altitude is "valid" or geometric	Change the second and third sentences as follows:

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					altitude (HAE) is "valid"? Why does it have to be less than 45 m? Some GPS receivers do not output VFOM, except if they are providing approach guidance. If an ILS landing is being flown, I would expect that ASSA/FAROA would be available, even without baro altitude. The validity for geometric position (HAE) should be acceptable for ASSA/FAROA in addition to meeting the horizontal validity and horizontal accuracy (HFOM) requirement. As written, the third sentence (which states, "When on the surface, only own-ship horizontal position is required.") conflicts with the second sentence, which states that even on the surface, you need own-ship horizontal position valid and of sufficient quality (i.e., you need both horizontal position validity and quality).	"When airborne, ~~V~~vertical position is satisfied by ~~Height Above the Ellipsoid (HAE), when Vertical Position Uncertainty (VEPU) < 45 m,~~ either valid geometric altitude or valid pressure altitude ~~when airborne~~. Vertical position is not required to be valid when on the surface. ~~When on the surface, only ownship horizontal position is required.~~ **We really mean 45 m no change(see item 55)**
197.	Joel Wichgers	47	2.2.4.2.1	C	As stated above for Table 2-2, a 74 meter requirement for own-ship accuracy is not consistent with DO-257A, nor the rationale provided acceptable by the chairman of the DO-257A development.	Change the requirement to the DO-257A requirement: "When Own-ship accuracy is greater than ~~74m~~ 36 meters, ASSAP **shall** signal that ASSA/FAROA is Unavailable (fail) via the CDTI interface."

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198.	Joel Wichgers	47	2.2.4.2.1	S	It is not clear as written that either extended runway centerline or final approach course are needed for FAROA. Furthermore, we use different terminology for the same things in paragraphs 2 and 3. What is the difference between a "Runway Surface" (used in the second paragraph for FAROA) and an "Airport Runway" (used in the third paragraph to describe ASSA). I would suggest that we use identical language for things that are identical, so that the differences in requirements between ASSA and FAROA are clear and not obscured by terminology.	Change as follows: "If a Runway database is not available for depiction of the Runway ~~Surfaces,~~ Surfaces and Extended Centerline~~, and/~~ or Final Approach Course, ASSAP **shall** signal that FAROA is Unavailable (fail) via the CDTI interface. If an Airport Surface database is not available for depiction of the ~~Airport Runways,~~ Runway Surfaces, Extended Centerline or Final Approach Course, Taxiways, and Movement Surfaces, ASSAP **shall** signal that ASSA is Unavailable (fail) via the CDTI interface."
199.	Mosher	47	2.2.4.2.1	E	In the first paragraph, last sentence: It's not the accuracy, but the *uncertainty* in the accuracy that we are concerned with here.	Change the last sentence of the first paragraph to read, "When the uncertainty in the Ownship accuracy is greater than [74 m?], ASSAP **shall** signal that ASSA/FAROA is Unavailable (fail) via the CDTI interface."
200.	Mosher	47	2.2.4.2.1	E	In the first paragraph, last sentence: It's not the accuracy, but the *uncertainty* in the accuracy that we are concerned with here.	Change the last sentence of the first paragraph to read, "When the uncertainty in the Ownship accuracy is greater than [74 m?], ASSAP **shall** signal that ASSA/FAROA is Unavailable (fail) via the CDTI interface."
201.	Mosher	47	2.2.4.2.1	S	Also, is 74 meters the correct value? It	Ownship not limited to NACp value for

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					doesn't map to a NACp code.	ASSA/FAROA—based on RSS
202.	R. Brandao	47	2.2.4.2.1	S	The partitioning of ASSAP and CDTI is very useful however, in this case it may have caused some confusion. It is very possible that the CDTI has multiple sources of position while the ASSAP may not. Therefore ASSAP should continue to send traffic surveillance information (position, etc) of sufficient quality to the CDTI.	Add an additional note which state" "The avionics equipment which performs the traffic surveillance may continue to provide traffic surveillance data to the displays even if own ship accuracy is greater than 74 m provided that the displays will disable the ASSA/FOROA function when own ship accuracy no longer supports the application. **This MOPS does not preclude having some of the ASSAP functionality associated with the display hardware.**
203.	Mosher	47	2.2.4.2.2	E	The last sentence of the first paragraph, the wording "paragraphs e through h" is obsolete. There is no paragraph "h" in this section.	
204.	Mosher	48	2.2.4.3	E	Initial paragraph on CD (Conflict Detection): Does this text mean that this portion of the MOPS will not be included in an ASSAP TSO? It's confusing to use the word "shall" in this section, if they aren't minimum requirements.	Maynard: Yes, that's what it means.
205.	Honeywell	48	2.2.4.3	E	"Additional development and field testing is necessary" should be "Additional development and field testing are necessary"	Change as proposed

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COMMENT MATRIX

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206.	Terry Abbott	48	2.2.4.3	E	Misplaced parenthesis in… The alerts may prompt the flight crew to exercise additional “see and avoid “procedures,	See comment.
207.	Honeywell	49	2.2.4.3	S	“There are no minimum requirements on the CD algorithm. An example algorithm is provided in Appendix E.”	Should the CD function be in this document then? **It stays**
208.	Mosher	49	2.2.4.3.1	S	In the second paragraph, "manufacturer determined parameter value" is not a suitable minimum requirement.	Changed to needs to be determined during design approval
209.	AIR-130	49	2.2.4.3.1	E	Change second sentence of second paragraph to match Table 2-1 Note 7	When Ownship horizontal velocity uncertainty is greater than a parameter value determined during design (installation?) approval, ASSAP **shall** signal that CD is Unavailable(fail) via the CDTI interface.
210.	Joel Wichgers	49	2.2.4.3.2	S	This document says that “All versions of existing ADS-B links are capable of producing CD traffic … .” This is not complete. If I designed to this requirement, I would specifically exclude data on future link versions.	Change the sentence to read: “All versions of ~~existing~~ of the 1090ES and UAT ADS-B links are capable of producing CD traffic, and all future versions will be developed to be capable of producing CD traffic ~~(including DO-260 Version 0)~~. ACCEPT (are expected to)
211.	Mosher	49	2.2.4.3.2	S	In the first paragraph, what does "producing CD traffic" mean? Needs more clarity.	Eligible for CD alerting—which is immature
212.	AIR-130	49	2.2.4.3.2	E	Change subparagraph b to match Table 2-1 Note 7	Change to read: A traffic track **shall** have a NACv value determined during design approval or greater to be marked as a valid CD target.

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						Note: Value to be evaluated during design approval.
213.	Mosher	49	2.2.4.3.2.b	S	The term "manufacturer-determined minimum value" is not a suitable minimum requirement. Since the *Note* states that this value "is to be evaluated during installation approval," it seems that this is not a "manufacturer-determined value," but an FAA-determined value.	Changed to needs to be determined during design approval
214.	Honeywell	50	2.2.4.4	E	2nd Para., "Evapp" should be "EVApp"	Change as proposed
215.	Joel Wichgers	50	2.2.4.4.1	S	(3rd Paragraph in this section) Clarification is needed.	Change the sentence to read: "When ~~own aircraft~~ the own-ship Horizontal Position Integrity Containment Risk (ICR) is greater than 10^{-3}/hr or the horizontal position Radius of Containment ~~(RC)~~ (R_C) is greater than 0.5 NM, ASSAP **shall** signal that EVApp is Unavailable (fail) via the CDTI interface." ACCEPT with change
216.	Joel Wichgers	51	2.2.4.4.2	E	Editorial. Paragraph structure is better when switching the order of pressure altitude and geometric altitude (HAE).	"An EVApp traffic **shall** be derived from traffic with valid horizontal and vertical position. Vertical position is satisfied by pressure altitude or geometric altitude [i.e., Height Above the Ellipsoid (HAE)] or pressure altitude. When pressure altitude is used for vertical position, traffic **shall** have a NACp of 6 or greater to be marked as a valid EVApp traffic. When HAE is used for vertical

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						position, traffic **shall** have a NACp of 9 or greater to be marked as a valid EVApp traffic."
217.	Joel Wichgers	51-52	2.2.5 2.2.5.1 2.2.5.1.1 2.2.5.1.2 2.2.5.2	C	This entire section (including all the subsections) is too prescriptive on the exact type monitors, and does not contain the real integrity of function requirements. This entire section needs to be deleted as the types of monitors that will be required are implementation specific, and in its place a requirement needs to be written that addresses the integrity of the intended ASSAP function(s). The MOPS should not prescribe the exact monitors, since this is a functional requirement, and the MOPS writers have no idea which set of functions will be supported, or how a manufacturer may choose to meet a functional requirement. It is not apparent that the prescribed monitors sufficiently address the real underlying requirement which is an integrity of function requirement. The requirements in §2.2.5.1.1 which states "The self-test function shall not interfere with the normal operation of the equipment" is not correct. The self test	Delete the entire section 2.2.5 including all the subsections. Incorporate appropriate Hardware and Software "monitoring" requirements as subsections to the design assurance in §2.1.7. **"2.1.7.1 Hardware Design Assurance** An acceptable means to demonstrate integrity compliance for ASSAP and CDTI equipment is to show that failures of the equipment that result in misleading information or loss of function are not more probable than the allocated integrity and continuity requirements from the system safety assessment, respectively, for the most stringent functions and aircraft supported. For complex firmware implementations including, for example, microprocessors and Application-Specific Integrated Circuits (ASICs), development processes similar to those described in FAA Advisory Circular (AC) 20-152 [which references RTCA/DO-

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					better interfere with the normal operation if a fault is detected! The requirement in §2.2.5.1.2 also states that "The monitor shall not interfere with the normal operation of ASSAP." Such a requirement is not correct. The monitor better interfere with normal function when a fault is detected. How can one test for "non-interference"? Furthermore, some monitors will certainly interfere with the "normal function" of ASSAP, including for example power-up self tests, user requested self tests, etc. This requirement is not a valid requirement. §2.2.5.2 prescribes that monitors are implemented on the computer resources. How do I know that the prescribed monitors will appropriately cover the integrity for my implementation. Delete all "shalls" in this section describing the specific monitors required.	254()] or RTCA/DO-178B (or appropriate revisions) provide an acceptable means of compliance with applicable airworthiness requirements. **2.1.7.2 Software Design Assurance** FAA Advisory Circular (AC) 20-115B, which references RTCA/DO-178B, provides an acceptable means for showing that software complies with applicable airworthiness requirements." **DELETE SECTION AND REPLACE WITH SIMPLE WORDS**
218.	Mosher	52	2.2.5.2	S	This set of computer resource monitoring requirements seems rather excessive. If done in a comprehensive manner, this is a very expensive task, with little benefit. Clarify whether "monitor" implies continuous monitoring, or only power-on	OBE

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					self tests.	
219.	Honeywell	52 / 72	2.2.5.2 / 2.3.6.3	E	What do CPU timing tests entail?	Section 2.5.5.2 discusses this and it sure seems like overkill. These timing tests will not be simple.
220.	Joel Wichgers	52	2.2.5.3.1	E	Editorial.	"If no data is received ~~in~~ for 2 seconds, ASSAP **shall …"**
221.	Mosher	52	2.2.5.3.1	S	"If no data is received in 2 seconds, ASSAP **shall** annunciate an "ADS-B Receiver Input" failure on loss of input data from any ADS-B receive subsystem." There is no guarantee that ADS-B reports will always be available every 2 seconds. This requirement could cause false failures to be reported.	OBE
222.	R. Brandao	52	2.2.5.3.1 2.2.5.3.2	S	The requirement for both these sections is unclear. What is being monitored – that no ADS-B reports have been received (or TCAS reports) or that the interface has mal-functioned. Also – why was the number 2 seconds selected. The max data age for most applications is much larger than 2 seconds. Monitoring delays should be as large as possible, but no larger to avoid nuisance annunciations.	Modify the phrase "If no data is received in 2 seconds" to "If the interface is no longer valid or it is determined that the ADS-B receiver (or TCAS) has failed for more than 5 seconds , …" **These sections are now deleted per other comments**
223.	Joel Wichgers	52	2.2.5.3.2	S	Clarify that this requirement is only for TCAS equipped aircraft.	"If the aircraft is TCAS equipped, then ASSAP **shall** monitor the TCAS output to verify TCAS function. If no data is received ~~in~~ for 2

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						seconds, ASSAP **shall …"**
224.	Joel Wichgers	52	2.2.5.3.3	E	Editorial.	"If no data is received ~~in~~ for 2 seconds, ASSAP **shall …"**
225.	R. Brandao	52	2.2.5.3.3	S	Similar to comment on 2.2.5.3.1	Change 2 seconds to a larger number … e.g 5 seconds. **Section deleted per other comments**
226.	Joel Wichgers	52	2.3.1	S	CDTI should be required to "indicate" the position of own-ship and traffic (rather than "show"). While this word choice seems "editorial", it is really not. I interpret "show" the position, as the exact position must be shown, and it is not possible to indicate the position of "selected" or "alerting" traffic off the screen (because their position must be "shown"), so I would be required to automatically re-scale the display. Furthermore, I would like to have the ability to "pan" and shift the display to see various parts of the airport surface.	Change the first paragraph as follows: "The CDTI is defined as a graphical plan-view (top down) traffic display. The CDTI is required (in Section 2.3.4.1) to ~~show own ship~~ indicate own-ship position and (in Section 2.3.1.2) to show the positions, relative to the ~~ownship~~ own-ship, of traffic."
227.	Burns	52	2.3.1	C	The CDTI needs to interface with the avionics to indicate its availability.	Add a requirement on the CDTI to interface to the avionics and provide its availability Also add a test to test this requirement for both 1090ES and UAT implementations.
228.	Mosher	52	2.3.1	S	A CDTI need not necessarily be a top-down display. Other types of display projections should be permitted (pilot's point-of-view, for example).	

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229.	AIR-130	52	2.3.1	S	In first paragraph, qualify that many of the following requirements may still apply to traffic displays that do not fit the stated definition of CDTI.	Add the bold part of the following: "The CDTI is defined as a graphical plan-view (top down) traffic display. **Many of the following requirements may also apply to other types of displays (e.g., 3D perspective).**"
230.	Sethu Rathinam	52,53	2.3.1	S	Awkward split of applications and what is minimum (esp. the para that deals with what these are based on). Trying to do the minimum and "what reqs are based on" together. Split it up to clarify.	← change per comment
231.	Terry Abbott	53	2.3.1	L	"If these applications are implemented, all of the application requirements must be met" could be interpreted as the requirements do not need to be met if only one of the applications is implemented.	Change to "For each application that is implemented, all of the application's requirements must be met."
232.	R. Brandao	53	2.3.1.1	S	It does not seem that the default TDC should be a minimum performance requirement	Delete the section.
233.	Terry Abbott	53	2.3.1.1	E	In "All intruders causing an Resolution Advisory (RA)…" the term "intruders" has not been defined.	Change "intruders" to "traffic."
234.	AIR-130	53	2.3.1.1 b	E	"proximate" is a name in this context, and should therefore be capitalized here (and elsewhere).	Capitalize "Proximate".
235.	AIR-130	83	2.3.1.1 b	E	For consistency.	Hyphenate color-coded.
236.	Joel Wichgers	53	2.3.1.1.1	C	The default traffic display criteria may be appropriate when an aircraft is airborne, but it is not an appropriate default for pushing back from the gate when I have	Change item "b" as follows: "b. When airborne, the ~~The~~ default traffic

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					ASSA/FAROA applications on board the aircraft. The ASSAP should not be required to have this default display criteria. Furthermore, if, for example, there is a momentary power glitch when airborne, I would like to be able to restore the display in the exact configuration that the pilot selected when the glitch occurred, rather than making the pilot re-select.	display criteria **shall** be one of the following, either 1) to restore the display to the range and altitude selections that were selected prior to the loss of power, or 2) to display traffic within the selected range and within an altitude band of +/- 3500 ft. Add a "new" item "c". c. When on the ground, the default traffic display criteria **shall** be one of the following, either 1) to restore the display to the range and altitude selections that were selected prior to the loss of power, 2) if ASSA or FAROA applications are available, a standard ASSA/FAROA power-up selection, or 3) to display traffic within the selected range and within an altitude band of +/- 3500 ft. Change item "c" to become item "d". "d. ~~c.~~ All non-default TDC shall be annunciated."
237.		53	2.3.1.1.1	S	Why is the default 3500 feet?	Give rationale or remove 3500 as a default
238.	Mosher	53	2.3.1.1.1.b	S	"The default traffic display criteria **shall** be to display traffic within the selected range and within an altitude band of +/- 3500 feet."	

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					Disagree with this requirement. Present CDTI altitude filtering has been shown to be effective, and uses an altitude band of +/- 2,000 ft.	
239.	AIR-130	54	2.3.1.1.1.c	E	For clarity.	Provide an example annunciation of non-default TDC.
240.	Honeywell	54	2.3.1.1.2	S	Remove this section. If an alternative set of TDC is desired, a deviation will need to be requested.	
241.	AIR-130	54	2.3.1.1.2, Note 1	E	"kept" is informal.	Change "kept" to "retained".
242.	Honeywell	53	2.3.1.1.a	E	"an Resolution Advisory" should be "a Resolution Advisory"	Change as proposed
243.	AIR-130	54	2.3.1.2	E	Not clear: "All CDTI installations provide this information".	Clarify or delete.
244.	Petri	54	2.3.1.2	E	Update terminology	Change 3rd bullet in d from: 'Traffic Information Quality' to 'Traffic Application Capability'
245.	Edward Lester	54 and others	2.3.1.2	E	Brackets [] are displayed after 3 of the 5 shall's on page 54. These brackets have no apparent meaning.	Remove brackets after all shall's throughout the document for consistency.
246.	AIR-130	54	2.3.1.2.a	E	Not needed: "with regards to the display"	Delete "with regards to the display"
247.	Mosher	54	2.3.1.2.a	S	Disagree: Ownship Position is not required for a display from the pilot's point of view.	
248.	AIR-130	55	2.3.1.2.d	S	"Traffic Information Quality" no longer used in this document.	Change to "Traffic Application Capability"
249.	Volpe Center	54	2.3.1.2 Required	S	Altitude and other attributes are included in 2.3.1.2 Required Information, but it is	Instead of requiring the reader to determine if later the MOPS does or does not specifically

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			Information		not clear in 2.3.1.2 whether or not their display is limited to specific features such as in a data tag. 2.3.1.2d gives options: "Unless specifically noted, the information [altitude is listed below] can be conveyed graphically (e.g., in the traffic symbol), or as part of a data tag, or a data block."	note that the display of attributes such as altitude must occur in the data tag (as for altitude in 2.3.5.5g), state these requirements in 2.3.1.2.
250.	Joel Wichgers	81	2.3.10	S	Item "a" states: "a. The equipment **shall**[ ] be designed so that controls intended for use during flight cannot be operated in any position, combination or sequence that would result in a condition detrimental to the operation of the aircraft <u>or the reliability of the equipment</u>." The brightness of displays often affects the reliability / MTBF of the display lamp. Thus, a pilot can adjust controls that will and do impact the reliability of the equipment. Thus, making a "shall" requirement that indicates that no controls can impact the reliability of the equipment does not seem appropriate, since the only alternative would be to not give pilots control over the display brightness. I am sure that pilots want this capability, thus, the shall with regard to reliability needs to be deleted.	Change item "a" as follows: "a. The equipment **shall**[ ] be designed so that controls intended for use during flight cannot be operated in any position, combination or sequence that would result in a condition detrimental to the operation of the aircraft ~~or the reliability of the equipment~~."

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251.	AIR-130	82	2.3.10 (g)	E	For clarity.	Replace "distinguished" with "distinguishable". (This should be consistent througout MOPS).
252.	Craig Pettit	82	2.3.11	E	This section speaks to the use of color. There are many rules and ACs applicable to the use of color in the flight deck. One that comes to mind is AC 25-1322. This section should point to other sources that give guidance in this area.	Reference other regulatory guidance material that gives guidance for the use of color on flight deck display systems.
253.	Honeywell	83	2.3.11.c	E	"identifyable" should be "identifiable"	Change as proposed
254.	Joel Wichgers	55	2.3.2.1	E	Editorial. Time is in "msec", not meters.	"a. Maximum latency between interfaces F and G **shall** be 500 ~~m~~ msec."
255.	Edward Lester	55	2.3.2.1	E	In part a, the maximum latency is "500 m". Meters is not a standard unit for latency.	Change "500 m" to "500 msec".
256.	AIR-130	55	2.3.2.1.a	E	Units error.	Change "m" to "ms"
257.	Maynard	55	2.3.2.1.a	E	A maximum latency of "500 m" is meaningless. Was "500 ms" intended instead?	
258.	Honeywell	55	2.3.2.1.a	E	I've never known latency to be measured in meters before	Change "500 m" to "500 ms"
259.	Maynard	55	2.3.2.1.b	E	The symbol "msec" for "milliseconds" is not an approved SI symbol. Search throughout the document, and replace "msec" either with "ms" (the standard SI symbol" or spell it out as "milliseconds".	
260.	AIR-130	55	2.3.2.1.b (and associated	S	Required display response time too long. FAA AC 25-11A (Chapt 7, top of page 65) specifies 250ms response time (vs	Human Interface Latency: The ASAS latency from activation of a control input to the appearance of the response on the CDTI

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			test requirements on pg 115)		1100ms) for soft controls. RTCA DO-257A specifies 500ms as a "shall" for display response, but recommends 250ms. The rationale is to prevent unreasonable pilot workload and input errors (e.g., double-click).	shall be less than 1100 msec**, (250 ms is recommended)**. If this value exceeds **250 ms**, an indication that the system has recognized the input **shall** be provided until the response appears on the CDTI.
261.	Joel Wichgers	55	2.3.2.2	C	Missing requirements. It is not only required to show all traffic at the same TOA, it is also necessary to show them relative to own-ship position at the same TOA and that TOA must be close to the time that the information is presented on the display to maintain consistency with the out the cockpit view and the display and the relative bearing between own-ship and traffic.	Add the following requirement after "a": "b. The CDTI **shall**[] show the position of own-ship with a time of applicability that is within 0.500 msec of when it is shown on the display." Change the current "b" to "c" and modify as follows: "~~b.~~ c. The CDTI **shall**[] show the position of all displayed traffic at the same time of applicability as the own-ship time of applicability." **We added a time registration reqt in 2.2.2.5.2.1 and we think CDTI latency is covered in latency budget.**
262.	Joel Wichgers	56	2.3.2.3	E	Editorial.	The CDTI input requirements from the ASSAP are defined in Section 2.2.2.5, ASSAP Outputs Requirements to the CDTI.

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						The CDTI function **shall** be capable of receiving and processing the ASSAP outputs to the CDTI.
263.	Petri	56	2.3.2.4.1	E, I think	Requirement 'a' is not an output from CDTI to ASSAP. I think this is already covered in the application status requirement in 2.3.6.4.2	Delete requirement 'a'
264.	AIR-130	56	2.3.2.4.1 a	E	Requirement to annunciate to pilot has nothing to do with this section: Outputs from CDTI to ASSAP. None of the other items in 2.3.4.2 have a similar annunciation or indication requirement.	Move (a) to another section, or at least put it after (b).
265.	Joel Wichgers	56	2.3.2.4.2	S	The definition of "Coupled Traffic" is not correct as proposed, which states that coupled traffic is "traffic upon which an application is to be conducted." To illustrate the problem with this definition, consider, for example, the CD application, which should be run on all qualifying traffic tracks. The own-ship is certainly not coupled to all these traffic tracks, as would be implied by the definition as proposed.	Change the first paragraph as follows, which is consistent with the ASA MASPS: "A coupled Traffic is traffic upon which ~~an~~ a coupled application is to be conducted. Coupled applications are those applications that operate on only specifically chosen traffic. The only coupled application this MOPS version is the Enhanced Visual Approach application."
266.	Petri	56	2.3.2.4.2	E	In the second paragraph, the "associated application name" requirement could be misconstrued. All that is required is a way to identify the associated application.	Change "and the associated application name" to "and an identifier for the associated application"

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267.	Mosher	56	2.3.2.4.4	S	Recommend making this section into guidance, rather than stating as minimum requirements.	
268.	Petri	57	2.3.2.4.4	E	Typo in a: Domain (e.g., Genral Aviation (GA) approach	Add “e” to General
269.	Terry Abbott	57	2.3.2.4.4	E	In paragraph "a," the word "General" is misspelled.	See comment.
270.	R. Brandao	57	2.3.2.4.5	E	There is a whole list of things the CDTI could provide to ASSAP. If there are some specific requirements about how CDTI should provide this information to ASSAP then the section is needed – otherwise it provides limited value.	Remove the section.
271.	AIR-130	58	2.3.3.3	E	Provide example reference for standardized labels.	In opening paragraph, add a reference to ICAO Doc 8400 “ICAO Abbreviations and Codes, sixth edition 2004.
272.	Volpe Center	58	2.3.3.3 e. Labels.	S	“Labels should be oriented to facilitate readability.”	Consider a requirement rather than a recommendation prevent confusion due to number and letter orientation such as between M and W, and between b and 9
273.	AIR-130	58	2.3.3.4 b	S	Current text: “The shape, color, and other symbol characteristics should have the same meaning within the CDTI.” Unlike within the flight deck, it is within the MOPS scope to require same meanings of symbols within the CDTI.	Change “should” to “shall”
274.	Joel Wichgers	59	2.3.4.1	S	Item a: The symbol does not always “represent” the position of own-ship, but it does “indicate” the position of own-	Change item “a” as follows: a. The CDTI **shall** [ ] display a symbol ~~representing~~ indicating the location of the

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					ship. While this may sound like word-smithing, I believe that there is a difference in these words. §2.3.7.7 allows the CDTI to pan, and if that is done, the own-ship position may be off screen (e.g., for ASSA), and here own-ship position may be "indicated" by an off screen indication, rather than be representative of the exact location of own-ship.	own-ship.
275.	Joel Wichgers	59	2.3.4.1	S	Item b: The own-ship symbol does NOT have to always be direction when on the airport surface, per the requirements for the Surface Moving Map in DO-257A. What has been proposed for a requirement is in direct conflict with the minimum requirements of DO-257A.	Change item "b" as follows: "b. When airborne, the ~~The~~ own-ship symbol **shall** [ ] be directional (e.g., not a circle or square). When on-ground and moving at a ground speed greater than 20 knots, the own-ship symbol **shall** [ ] be directional. *Note: It is preferable that the own-ship symbol is always directional.*"
276.	AIR-130	59	2.3.4.1 d	E	"The manufacturer shall….". Is it expected that the pilots will know this? How does this requirement fit into minimum requirements for CDTI ? This also shows up for traffic vs ownship in 2.3.4.2.3.1 b.	Not sure about resolution…depends on the intent of requirement.
277.	Mosher	59	2.3.4.1.a	S	"The CDTI **shall** [ ] display a symbol representing the location of the own-ship."	

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					Ownship symbol is only required if the ownship position is shown on the display. Not required for pilot's point of view display.	
278.	Volpe Center	59	2.3.4.1 Ownship	S	Ownship requires "The CDTI shall [ ] display a symbol representing the location of the own-ship." However, panning (2.3.7.7) can remove ownship from the display.	Reconcile this conflict.
279.	Petri	61	2.3.4.2.1	E	Item c: A space is missing: **shall**include:	Add space
280.	Volpe Center	67	2.3.4.2.1 and 2.3.5.5.1 Traffic Relative Altitude	S	Data tags showing altitude are required in 2.3.4.2.1 for systems that show data tag info, and their positioning requirements are defined in 2.3.5.5.1 Traffic Relative Altitude (p.67), but the MOPS does not address how to display them for traffic that alerts and is to be positioned at the edge of the display (p.63, 2.3.4.2.3.2.4 Alerts). That is, how would one display altitude above a symbol at 12 o'clock or below a symbol at 6 o'clock?	Consider uniformly displaying altitude for traffic symbols at the edge of the display adjacent to the symbol and toward the center of the display.
281.	Honeywell	60	2.3.4.2.1.c	E	"**shall**include" should be "**shall** include"	Change as proposed
282.	Honeywell	60	2.3.4.2.1.c	S	Does "traffic altitude" imply barometric altitude, geometric altitude, relative altitude, etc.?	
283.	Joel Wichgers	61	2.3.4.2.2	S	Disagree that the "should" is an improvement in the equipment design (per definition of the use of "should" in §1.6.1).	Delete the following statement: "~~Data block(s) should be displayed at a fixed location on the display unit.~~"

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284.	Petri		2.3.4.2.3	C	Section 2.2.2.5.1.16 (the note) allows data that is invalid for EVAcq to be sent forward to CDTI. This goes against the agreements reached within the joint ASSAP/CDTI sessions, and also conflicts with numerous sections and requirements in both the ASSAP and CDTI sections of the document.	Alter the second sentence of the note in 2.2.2.5.1.16 to prohibit sending the invalid information: *For an ADS-B, ADS-R, or TIS-B track not correlated with a TCAS track, ASSAP **shall** not send the traffic to the CDTI since it does not meet the performance for the minimum required application (EVAcq).*
285.	AIR-130	61	2.3.4.2.3	E	Current text: "ground vehicles should be distinguishable from aircraft". This is in the symbol section, but the requirement should not imply a symbolic means of distinguishing.	Move requirement to another location that does not imply any particular design solution.
286.	Volpe Center	61	2.3.4.2.3 Traffic Symbols.	S	The requirement to display one traffic symbol for each traffic report falls short of what is required. This allows uncorrelated traffic reports to result in multiple symbols. As this is a function of ASSAP processing, the specs for this processing need to virtually eliminate correlation failures such as failures to correlate TIS-B and ADS-B reports. False targets would seriously degrade the potential of EVAcq.	Require one traffic symbol for each traffic instance, and require that ownship not also be displayed as traffic.
287.	Joel Wichgers	61	2.3.4.2.3.1	S	Item a: The traffic symbol also needs to be shown with respect to the underlying	Change item "a" as follows: "a. The CDTI **shall**[ ] position each traffic

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					surface map, and the bearing may not be know for surface traffic, per a previous comment to gain requirements consistency with DO-257A for surface moving map.	symbol at a location representing its relative range and bearing with respect to own-ship <u>or with respect to the underlying surface map</u>."
288.	Volpe Center	61	2.3.4.2.3.1	S	Traffic Symbol Location recommends locating the reference point at the center of the symbol for non-directional symbols, but gives no guidance on directional symbols. If directional symbol reference point is at the apex and non-directional symbol reference is at the center, the aircraft may appear to "jump" or move forward or backward when directionality info is lost or regained as may occur when an aircraft stops and starts such as at a runway hold line.	Insert a recommendation for location of the reference point for directional symbols.
289.	AIR-130	62	2.3.4.2.3.2.1	E	Current text is confusing. What does it address? One could have a heading-up display, and show traffic orientation based on ground track angle. Ownship reference affects traffic position on the display, not orientation on the display.	Not sure about resolution…depends on the intent of requirement.
290.	Mosher	62	2.3.4.2.3.2.1.b	S	"The traffic symbol **shall** not imply directionality (e.g., not a chevron) if valid directionality is not available." Disagree. This requirement should only apply if directionality is a critical	

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					parameter for a specific automated application. There is a pilot workload issue associated with changing the target icon based its movement.	
291.	Petri		2.3.4.2.3.2.2	S	Item B: If resolution 1 from comment 8 is accepted, then item B is incorrect. Such items would not be received.	Remove item B
292.	Petri		2.3.4.2.3.2.2	E	Numerous editorial problems with note 2	Replace with: Note 2: ASSAP may provide TCAS-only data that does not support EVAcq. TCAS data will still be displayed.
293.	Joel Wichgers	62	2.3.4.2.3.2.2	E	Editorial.	Note 2: *2. ASSAP ~~provide~~ provides TCAS-only data that may not support the EVAcq data quality. TCAS data will still be displayed.*
294.		63	2.3.4.2.3.2.4	s	An indication of proximate traffic should be optional. Since it is not alerted, it is completely random whether crews notice it.	Remove the requirement for a proximate traffic symbol. **Withdrawn—its only a should**
295.	AIR-130	63	2.3.4.2.3.2.4 "e"	E	Last requirement should be lettered "e", vs not being lettered at all.	
296.	Volpe Center	63	2.3.4.2.3.2.4 Alerts	C	Disagree with the requirement to display directionality on the TCAS RA symbol. For an RA, the flight crew should respond to the RA, not look for the traffic. [The MOPS require "If traffic directionality is	Delete the requirement to display directionality on the TCAS RA symbol.

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					valid, directionality information shall not be removed during alerts." In 2.3.4.2.3.3 (TCAS) n Note 2a, the MOPS say "If directionality is valid, directionality information shall not be removed during a TCAS Traffic Resolution or Resolution Advisory" and further notes that this information "may assist the flight crew in visual search…."]	
297.	AIR-130	63	2.3.4.2.3.2.4 d	S	Current text: "The traffic symbol should indicate airborne proximate status". This is not clear that it applies to TCAS shared displays.	Add to the beginning, "For TCAS/ASAS shared displays…"
298.	AIR-130	63	2.3.4.2.3.2.5	E	Selected Traffic. For consistency with previous topics under "traffic symbol variations", include here "The traffic symbol may indicate Selected status"	Add a first requirement: "The traffic symbol may indicate Selected status"
299.	AIR-130	63	2.3.4.2.3.2.5 Last note	E	Paste error.	Change "coupled" half-symbol to "Selected" half-symbol.
300.	AIR-130	63	2.3.4.2.3.2.6	E	Coupled Traffic. For consistency with previous topics under "traffic symbol variations", include here "The traffic symbol may indicate Coupled status"	Add a first requirement: "The traffic symbol may indicate Coupled status"
301.	Petri		2.3.4.2.3.3	E	The ordering of this section is a bit confusing. The first two notes should apply to the whole section, since they are general. The first paragraph ought to be labeled, as it is a separate item. I think moving the first sentence and the two	Reorder current text as such: a. If traffic directionality is valid, directionality information shall not [] be removed during a TCAS Traffic Advisory or Resolution Advisory.

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					notes under it down below item A, and then labeling the sentence as B would make it somewhat more clear:	*Note: Directionality information, if available, may assist the flight crew in visual search and identification of the alerted traffic.* b. When TCAS surveillance information exists with no other correlating data (e.g., ADS-B data), the symbology displayed may be standard TCAS symbology. *Note:* *1. TCAS aural alerts and resolution guidance are not affected by these requirements or recommendations.* *2. Appendix G describes TCAS/ADS-B display symbol integration issues.*
302.	AIR-130	64	2.3.4.2.3.3	S	TCAS. First sentence "When TCAS surveillance…" implies that standard TCAS symbols can't be used with correlated traffic (e.g., diamonds).	Remove the first sentence "When TCAS surveillance information…."
303.	Honeywell	64	2.3.4.2.3.3	S	Shouldn't the first sentence in this section be a requirement (i.e., if you are using TCAS data with no correlating data, the symbol **shall** be standard TCAS symbology)?	
304.	Honeywell	64	2.3.4.2.3.3	E	The "shall" (or requirement) appears as part "a" of Note 2.	Remove the "a." in front of the sentence following Note 2.
305.	AIR-130	64	2.3.4.2.3.3	S	Note (a) "If traffic directionality is	Format (a) so that it is a requirement and not a

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			a		valid…" is a requirement, and not a note.	note.
306.	Joel Wichgers	64	2.3.4.3	C	The minimum requirement of 16 traffic elements is not sufficient for ASSA/FAROA.	Change item "a" as follows: "a. The CDTI **shall**[] be capable of displaying at least 16 traffic elements. <u>If ASSA/FAROA are supported, then the CDTI shall be capable of simultaneously displaying at least 16 airborne and 14 ground traffic elements.</u>"
307.	AIR-130	64	2.3.4.3	S	The pilot should be notified if the density of traffic meeting the traffic display criteria is extremely high. Failing to notify the pilot could result in visual acquisition errors, especially in a low visibility environment. (e.g., pilot may mistakenly acquire a distant aircraft that would normally meet the CDTI traffic display criteria and mistakenly correlate it to a nearby aircraft on the CDTI; the CDTI would reinforce the pilot's false sense of proximity if it has no indication that traffic density exceeds the display criteria).	Change "should" to "shall". Revised text: "The CDTI **shall** provide an indication when the number of traffic elements meeting the traffic display criteria exceeds the maximum number of traffic elements that can be displayed."
308.	Honeywell	64	2.3.4.3.b	S	This seems like it will only add clutter to the display. It should be assumed, as in TCAS, that the computer is tracking more than it's displaying.	Remove "b"
309.	AIR-130	62	2.3.42.3.2.2 Note 2	E	Sentence clarity.	Change "provide" to "provides" (?)
310.	Joel Wichgers	70	2.3.5.11	C	Statements like that made herein (that horizontal velocity is relative to the	Change the first sentence as follows:

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					ground) is not technically correct, and needs to be corrected. What sensor is providing this information? It seems like a small issue, but it is being propagated too far and we need to appropriately resolve this before yet another standard is codified by SC-186 that is incorrect. The horizontal velocity vector is a geometric velocity, and not a velocity relative to the ground, unless the aircraft is on the ground. The GPS receiver (or transponder) does not have a terrain database to project the velocity as if it were on the ground, and it does not project it to a reference surface (like MSL or the WGS-84 ellipsoid). When, an aircraft is airborne, the horizontal velocity is the local level geometric velocity. That is what is supplied both by GPS sensors and inertial systems.	"Horizontal velocity vector is the instantaneous magnitude and direction of the horizontal velocity ~~relative to the ground~~."
311.	AIR-130	70	2.3.5.11 (c)	E	This requirement is poorly worded. It suggests that the horizontal velocity vector does not have to use a time-based function. A horizontal velocity vector is time-based, regardless of what units you choose (Velocity = Distance / Time). The requirement was intended to require the velocity vector to scale appropriately in	Revise to read: If the length of the horizontal velocity vector represents a set prediction time (e.g., 60 seconds), the velocity vector's size **shall** scale according to a fixed time when the display's range is changed.

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					size as the range value is changed.	
312.	AIR-130	70	2.3.5.12	S	The current display range criteria do not address field of view. It is appropriate to allow for any field of view appropriate to the intended function, but the field of view should be indicated on the display. Further, it is appropriate for SC-186 to recommend a field of view that would be expected for most systems.	Add: "The display **shall** clearly indicate the field of view provided." Add: "The display should provide a field of view no less than a 180 degree forward field of view." (or as suggested by SC-186)
313.	R. Brandao	70	2.3.5.12	S	The rationale for a minimum range of 40 NM or 10 NMI is not clear – especially for lower end GA applications.	Replace bullet a and b with a minimum display range.
314.	R. Brandao	70	2.3.5.13	S	Although desireable – it does not seem like a compass rose should be part of a minimum requirements for the display.	Delete bullet "c".
315.		71	2.3.5.13	c	Some aircraft and operators use track up displays. It would be misleading to have traffic relative to aircraft heading on those displays. The MASPS should allow either as the minimum.	Change section to allow traffic to be oriented to track or heading depending on the orientation used on the aircraft for navigation. **We will accept this for editorial group to do. Leave option for either.**
316.	R. Brandao	66	2.3.5.3	S	It is not clear why this is a minimum requirement. For example – some designs could have a display that only shows airborne traffic and a supplementary display could show traffic on or near the ground over an airport map.	Delete the section or make it optional. At a minimum delete the phrase "in the traffic symbol or the associated data tag".
317.	AIR-130	66	2.3.5.4 (c)	S	Depending on the requirement for the minimum accuracy of closure rate data	If the closure rate accuracy is less than the

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					provided by the ASSAP, the "1 knot" *resolution* might imply a false *accuracy*. The CDTI should not display closure rate in a way that could be misleading to the pilot.	required display resolution of "1 knot", then consider a coarser closure rate display resolution requirement.
318.	Honeywell	122	2.3.5.4(4) test	E	+/- 99 knots does not match requirement	
319.	Honeywell	66	2.3.5.4.d	S	TCAS can track objects up to a 1200 knot closure rate. Why only +/- 199 here?	
320.	AIR-130	66	2.3.5.5.b	E	Since "actual altitude" is not a common term outside of TCAS, point to the definition in 2.3.5.5.2.	Add a note that points to the definitions of relative and actual altitudes in 2.3.5.5.1 and 2.3.5.5.2 .
321.	Honeywell	66	2.3.5.5.f	E	"display" should be "displayed"	Change as proposed
322.	Joel Wichgers	67	2.3.5.5.1	S	"Item d": The data tag for co-altitude should not be specified. It is a requirement that it is distinguishable, not the exact character set "00".	Change items "d" as follows: "d. The data tag for co-altitude traffic (traffic at the same altitude as the own-ship) **shall**[ ]be distinguishable (e.g., displayed as the digits "00"). *Note: The "+" or "-" tag may be retained with the ~~"00"~~ distinguishable co-altitude indication to denote that the system is in the relative altitude mode.*
323.	Joel Wichgers	67	2.3.5.5.1	S	"Item e, f, and g": The data tag for co-altitude should not be specified. It is a requirement that it is distinguishable, not the exact character set "00".	Change items "e", "f", and "g" as follows: e. The ~~"00" characters~~ distinguishable co-altitude indication should be placed above the traffic symbol if the traffic descended from above; below the symbol if the traffic climbed from below to the ownship altitude.

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						f. If ownship climbed to the traffic altitude, the ~~"00" characters~~ distinguishable co-altitude indication should be placed above the traffic symbol, if the ownship descended to the traffic altitude, the "00" characters should be placed below the traffic symbol. g. If traffic is at co-altitude with own-ship when initially displayed, the ~~"00" characters~~ distinguishable co-altitude indication should be placed below the traffic symbol.
324.	Honeywell	67	2.3.5.5.1.a/ b	S	The altitude value is placed in the data tag and required to be above or below the traffic symbol, but I thought I read earlier that the data tag just had to be associated with the traffic symbol (see 2.3.4.2.1.b). Does this requirement supersede that one?	
325.	Joel Wichgers	67	2.3.5.5.2	C	Barometric altitude is pressure altitude with the local barometric pressure correction applied. We should never say that "pressure altitude" is "barometric altitude" because that is not a technically correct statement, and leads to tremendous confusion. The terms "pressure altitude" and "barometric altitude" are not the same per the industry recognized definitions for these terms, and we should not use these terms interchangeably.	Change the first sentence as follows: Actual Altitude is pressure altitude~~, also referred to as barometric altitude~~.

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326.	AIR-130	68	2.3.5.5.2	S	Last sentence is curently "If the crew is allowed to select actual barometric altitude, this altitude shall not be displayed for more than 15 seconds per selection." This requirement came from TCAS (such as AC 20-131A), but in TCAS the time limit only applied to when there was no ownship baro correction. Since baro correction is required here (if actual altitude is optionally implemented), remove the last sentence.	Remove the last sentence: "If the crew is allowed to select actual barometric altitude, this altitude shall not be displayed for more than 15 seconds per selection."
327.	Honeywell	68	2.3.5.6.a	E	"a up" should be "an up"	Change as proposed
328.	Honeywell	68	2.3.5.6.a.2	E	Traffic Vertical Direction is actually "not applicable" for on-ground traffic.	Change "not required" to "not applicable"
329.	AIR-130	69	2.3.5.9.b	E	Informal word, "tell"	After parenthesis, replace end of sentence with, "…for the flight crew to understand without additional cross references."
330.	Joel Wichgers	71	2.3.6.1	E	Editorial.	2. Airborne traffic with warning level alerts (including TCAS ~~Ras~~ RAs) 4. Airborne traffic with cautions level alerts (including TCAS ~~Tas~~ TAs)
331.	AIR-130	71	2.3.6.1	E	We should be clear that this is a prioritization for *overlay* on the display, and not tied to the prioritization used for the traffic display criteria.	Add "for Overlay" to the section header: "CDTI Symbol Prioritization for Overlay"
332.	Honeywell	71	2.3.6.1	S	Why is this not a requirement?	Make this a requirement

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333.	Honeywell	71	2.3.6.1	E	Number 4 – "TCAS Tas" should be "TCAS TAs"	Change as proposed
334.	Terry Abbott	71	2.3.6.1	E	in paragraph "2.," "Ras" should be "RAs."	See comment.
335.	Terry Abbott	71	2.3.6.1	E	in paragraph "4.," "Tas" should be "TAs."	See comment.
336.	Joel Wichgers	72	2.3.6.1	C	This entire section is too prescriptive on the exact type monitors, and does not contain the real integrity of function requirements. This entire section needs to be deleted as the types of monitors that will be required are implementation specific, and in its place a requirement needs to be written that addresses the integrity of the intended CDTI function(s). The MOPS should not prescribe the exact monitors, since this is a functional requirement, and the MOPS writers have no idea which set of functions will be supported. It is not apparent that the prescribed monitors sufficiently address the real underlying requirement which is an integrity of function requirement. For example, the last sentence in the first paragraph requires that the self test shall be capable of detecting "a failure". Thus, all a manufacturer needs to implement is a	Delete the entire section §2.3.6.1 as proposed. The Hardware and Software design assurance requirements that I previously proposed for adding to §2.1.7 (i.e., new subsections §2.1.7.1 and §2.1.7.2 for Hardware and Software Design Assurance), cover the CDTI monitoring requirements.

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					monitor that can detect a single type of failure, and they can pass the MOPS requirements. This is clearly not sufficient. We need to delete all the prescriptive monitor requirements, and specify the basic integrity requirement.	
337.	Honeywell	71	2.3.6.2.a	S	Seems like the first sentence is really covered by part b, and the second sentence should be the real requirement. Or maybe this should be removed entirely.	
338.	Honeywell	73	2.3.6.4.1	E	First requirement – do you really need a requirement to indicate the absence of power (e.g., blank display)? What else would the display do?	Remove the requirement
339.	R. Brandao	74	2.3.6.4.2	S	Related to comment against 2.2.2.5.3.1	Add the following as a new paragraph # 2. "The equipment shall be capable of indicating which applications are available". Delete the rest of the section (i.e. bullets a-c.)
340.	Honeywell	74	2.3.6.4.2.b	S	This is redundant with "a".	Remove part b
341.	Joel Wichgers	74	2.3.6.5	S	What does the following statement mean "CDTI alerting should not interfere with other alerting systems." There will be a flight deck priority of alerts, which means when the ASAS alerts have priority, it may suppress (i.e.,	Delete item "a" as follows, and modify item "b" to address: "~~a. CDTI alerting should not interfere with other alerting systems.~~" "b. Alerts should be consistent with the flight deck alerting system and philosophy, and

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					interfere with) lower level alerts. Thus, "should not interfere" is not true, since it may interfere with lower level alerts.	should not interfere with higher priority alerts."
342.	Honeywell	74	2.3.6.5	S	See DO-185B section 2.2.7.2.5.4 for how TCAS handles warning prioritization with other systems. CDTI should require a similar method.	Kevin Wilson to provide reference text.
343.	AIR-130	74	2.3.6.5 b	E	A key aspect of alerting is color, but that is mentioned in another section. Reference that section here.	Add a note in b, "2.3.11 addresses the use of color for alerts."
344.	AIR-130	74	2.3.6.5 c	E	Bullet c is a subset of bullet e, so it is redundant.	Delete c.
345.	Honeywell	74	2.3.6.5.f Note	E	"ref XXX" should be replaced with "DO-185B, section 2.2.6.3.2"	Change as proposed
346.		75	2.3.7.6	s	Declutter does not seem to rise to the level of needing one button push. For instance for installations where menus can be hidden it seems acceptable to unhide the menu then declutter.	Remove the text "e.g., single button push" in two places.
347.	Honeywell	76	2.3.8.1	S	2nd para. – so where is the "exhaustive or comprehensive list of requirements/guidelines"?	Tell us where we can find such a list.
348.	Joel Wichgers	77	2.3.8.1	S	Disagree with the assertion that "red" colored terrain means that "immediate pilot action is required." Many displays use red terrain as an indication that terrain is higher than own-ship, and this indication does not mean "immediate pilot action is required". This example of "red	Change item "b" as follows: "For example, a red traffic symbol ~~and red terrain~~ should both mean that immediate pilot action is required."

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					colored terrain" is not needed to describe the CDTI requirements, and it is best to delete it, since it is not correct as written.	
349.		77	2.3.8.1	s	CDTI warnings and cautions could be displayed on other instruments or displays and not require a pop up on the MFD	In MFD implementations allow cautions and warnings to be displayed elsewhere in the cockpit in lieu of a pop up. **Bob will provide words**
350.	Terry Abbott	77	2.3.8.1	M	It would seem that "If non-traffic information is integrated with the traffic information on the display, the directional orientation….. shall[] be consistent among the different information sets" would imply that airborne traffic directional symbology relying on ground track data would not be permissible for use on a heading oriented MFD.	Please clarify if this is not the intent of this text.
351.	Volpe Center	77	2.3.8.1 Multi-function Display. e.	S	"An indication that traffic is being displayed on the MFD shall be present during normal operation…so that if the display of traffic is disabled, it is obvious to the pilot." The absence of traffic on the CDTI is ambiguous, meaning either no traffic in range or a disabled traffic display.	Revise to "An indication that traffic is being displayed on the MFD other than the traffic itself shall be present during normal operation…so that if the display of traffic is disabled, it is obvious to the pilot."
352.	Volpe Center	77	2.3.8.1 Multi-function Display. f.	S	"CDTI cautions and warnings shall[] be indicated on the MFD, regardless of the active MFD function (i.e., traffic with caution and/or warning level alert should pop up even if traffic information is not	Insert text recommending that there should be a way to disable alerts in case false alarms become excessive.

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					being displayed)."	
353.	Volpe Center	77	2.3.8.1 Multi-function Display. g.	S	"If there are separate range controls for different functions (e.g., weather radar and traffic), one control should affect the range setting for all currently displayed functions."	Make this clearer by adding the word "additional" in "one additional control should affect the range setting…" because it seems to require the same "one control" for an individual function to also control all currently displayed functions.
354.	Honeywell	77	2.3.8.1.e	S	I'm not sure that the lack of an indication will ensure that "if display of traffic is disabled, it is obvious to the pilot"	Require an indication if display of traffic is disabled.
355.	Honeywell	77	2.3.8.1.h Note	E	Seems like this note belongs under part "i"	Change as proposed
356.	AIR-130	79	2.3.9.1 (j) & 2.3.9.1 (k)	S	"CAZ clear" and "CDZ clear" are jargon to the pilot, and should not be used in the flight deck.	Remove "'CAZ clear'" and "'CDZ clear'" examples. If necessary, suggest or require alternate aural messages that are meaningful to the pilot, and of course clear and unambiguous.
357.	Petri		2.3.9.1.d note 3	E		Change "these parameters names" to "these parameter names" (that is, delete the "s" on parameters.
358.	Petri		2.3.9.1.d note 3	E		Change "these parameters names" to "these parameter names" (that is, delete the "s" on parameters.
359.	Honeywell	79	2.3.9.1.g/h	S	Specify the aural alerts to be given to ensure consistency across platforms.	
360.	Honeywell	79	2.3.9.1.j Note	S	Seems like the note is really a requirement	Make note into a requirement
361.	Edward	80	2.3.9.2	E	In part d, a negative requirement is used	Reword to a positive requirement with the

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	Lester				in the second sentence ("Aircraft positions shall not be adjusted to snap to runways or taxiways.")	negative reasoning in parenthesis: "Aircraft positions shall reflect the received position. (I.e. position is not adjusted to snap to runways or taxiways.).
362.	Craig Pettit	80	2.3.9.2	S?	This section states a graphical depiction of the airport surface including taxiways and runways are required as an underlay for ASSA and FAROA. From a retrofit perspective, some legacy display systems will not support this graphical depiction. There are also no examples of this graphical depiction in Appendix K.	Consider adding an example of the ASSA and FAROA application with graphical depiction of the airport in Appendix K. Perhaps address retrofit installations and their limitations somewhere in the document. What are your expectations for functionality in these cases?
363.	Honeywell	81	2.3.9.3	C	Horizontal Velocity Vector must be an optional feature for EVAPP. On small GA Displays in moderate traffic environments, this feature will render the display unusable.	Horizontal Velocity Vector should be a recommended feature of EVApp.
364.	Petri		2.4	E	There is an "Error! Reference Source Not Found!" message in the 4th paragraph	
365.	Honeywell	84	2.4	E	Last para. – Resolve the "**Error! Reference source not found**"	Change as proposed
366.	Burns	n/a	2.5	C	There should be hyperlinks in the ASSAP test section pointing back to the ASSAP requirements sections satisfied by each particular test in the test section.	Add hyperlinks to the ASSAP test section with the appropriate links to the requirements section.
367.	Burns	88	2.5.2.1	C	A place holder is needed for the requirement in section 2.2.2.1	Replace the existing test procedure with the following the text in section 2.5.2.1: **Verification of ASSAP Input Requirements**

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						from ADS-B/TIS-B Receiver (§2.2.2.1) No specific test procedure is required to validate §2.2.2.1.
368.	Burns	88-89	2.5.2.1.1	C	A test is needed for the requirement in section 2.2.2.1.1	Insert the following test in a newly created section 2.5.2.1.1: **Verification of Traffic State Vector Report Input Requirements (§2.2.2.1.1)** Test Tool Requirements: It will be necessary to be able to modify the injected scenarios used in this section to conduct negative tests to exercise data field values outside the expected values (e.g.) reserved values, to ensure that such data field values are properly handled by ASSAP as data not available. Test Procedure: Step 1. Inject Scenario 1-1 from section 2.5.6.1 as stimulus to ASSAP, but without the TCAS source. Use 1090ES or UAT report format as appropriate for the installation. Ensure ASSAP is configured to provide all available data to the CDTI interface. Verify that the track appears on the CDTI interface and the extrapolation of that track is

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						consistent with the truth data. Verify that the State Vector Report data for the track appears on the CDTI interface. Interrupt the data input and verify that after the appropriate data age timeout for each of the data fields, with a timeout listed in Table L-1, on the CDTI interface that the data not available case is reflected. Repeat this step with a modified version of Scenario 1-1 where each data field that has reserved values has one of the reserved values set in a given ADS-B/TIS-B report in order to exercise each data field for those data fields that have reserved values. Verify that ASSAP treats any data field with a reported value outside the normal expected values as data not available. Step 2. Inject Scenario 1-2 from section 2.5.6.1 as stimulus to ASSAP, but without the TCAS source. Use 1090ES or UAT report format as appropriate for the installation. Ensure ASSAP is configured to provide all available data to the CDTI interface. Verify that the appropriate tracks appear on the CDTI interface and the extrapolation of that track is consistent with the truth data. Verify

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						that the State Vector Report data for the track appears on the CDTI interface. Interrupt the data input and verify that after the appropriate data age timeout for each of the data fields, with a timeout listed in Table L-1, on the CDTI interface that the data not available case is reflected. Repeat this step with a modified version of Scenario 1-2 where each data field that has reserved values has one of the reserved values set in a given ADS-B/TIS-B report in order to exercise each data field for those data fields that have reserved values. Verify that ASSAP treats any data field with a reported value outside the normal expected values as data not available. Step 3. Inject Scenario 1-3 from section 2.5.6.1 as stimulus to ASSAP, but without the TCAS source. Use 1090ES or UAT report format as appropriate for the installation. Ensure ASSAP is configured to provide all available data to the CDTI interface. Verify that the appropriate tracks appear on the CDTI interface and the extrapolation of that track is consistent with the truth data. Verify that the State Vector Report data for the track

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						appears on the CDTI interface. Interrupt the data input and verify that after the appropriate data age timeout for each of the data fields, with a timeout listed in Table L-1, on the CDTI interface that the data not available case is reflected. Repeat this step with a modified version of Scenario 1-3 where each data field that has reserved values has one of the reserved values set in a given ADS-B/TIS-B report in order to exercise each data field for those data fields that have reserved values. Verify that ASSAP treats any data field with a reported value outside the normal expected values as data not available.
369.	Burns	88-89	2.5.2.1.2	C	A test is needed for the requirement in section 2.2.2.1.2	Insert the following test in a newly created section 2.5.2.1.2: **Verification of Traffic ID/Status Data Report Input Requirements (§2.2.2.1.2)** Test Tool Requirements: It will be necessary to be able to modify the injected scenarios used in this section to conduct negative tests to exercise data field values outside the expected values (e.g.) reserved values, to ensure that such data field values are properly handled by ASSAP as data

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						not available. Test Procedure: Step 1. Inject Scenario 1-1 from section 2.5.6.1 as stimulus to ASSAP, but without the TCAS source. Use 1090ES or UAT report format as appropriate for the installation. Ensure ASSAP is configured to provide all available data to the CDTI interface. Verify that the track appears on the CDTI interface and the extrapolation of that track is consistent with the truth data. Verify that the Traffic ID/Status Report data for the track appears on the CDTI interface. Interrupt the data input and verify that after the appropriate data age timeout for each of the data fields, with a timeout listed in Table L-1, on the CDTI interface that the data not available case is reflected. Repeat this step with a modified version of Scenario 1-1 where each data field that has reserved values has one of the reserved values set in a given ADS-B/TIS-B report in order to exercise each data field for those data fields that have reserved values. Verify that ASSAP treats any data field with a reported value

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						outside the normal expected values as data not available. Step 2. Inject Scenario 1-2 from section 2.5.6.1 as stimulus to ASSAP, but without the TCAS source. Use 1090ES or UAT report format as appropriate for the installation. Ensure ASSAP is configured to provide all available data to the CDTI interface. Verify that the appropriate tracks appear on the CDTI interface and the extrapolation of that track is consistent with the truth data. Verify that the Traffic ID/Status Report data for the track appears on the CDTI interface. Interrupt the data input and verify that after the appropriate data age timeout for each of the data fields, with a timeout listed in Table L-1, on the CDTI interface that the data not available case is reflected. Repeat this step with a modified version of Scenario 1-2 where each data field that has reserved values has one of the reserved values set in a given ADS-B/TIS-B report in order to exercise each data field for those data fields that have reserved values. Verify that ASSAP treats any data field with a reported value outside the normal expected values as data not

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						available. Step 3. Inject Scenario 1-3 from section 2.5.6.1 as stimulus to ASSAP, but without the TCAS source. Use 1090ES or UAT report format as appropriate for the installation. Ensure ASSAP is configured to provide all available data to the CDTI interface. Verify that the appropriate tracks appear on the CDTI interface and the extrapolation of that track is consistent with the truth data. Verify that the Traffic ID/Status Report data for the track appears on the CDTI interface. Interrupt the data input and verify that after the appropriate data age timeout for each of the data fields, with a timeout listed in Table L-1, on the CDTI interface that the data not available case is reflected. Repeat this step with a modified version of Scenario 1-3 where each data field that has reserved values has one of the reserved values set in a given ADS-B/TIS-B report in order to exercise each data field for those data fields that have reserved values. Verify that ASSAP treats any data field with a reported value outside the normal expected values as data not available.

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370.	Burns	89	2.5.2.3	C	A place holder is needed for the requirement in section 2.2.2.3	Replace the existing test procedure with the following the text in section 2.5.2.3: **Verification of ASSAP Input Requirements from Own-Ship Navigation (§2.2.2.3)** No specific test procedure is required to validate §2.2.2.3.
371.	Burns	89	2.5.2.3.1	C	A test is needed for the requirement in section 2.2.2.3.1	Insert the following test in a newly created section 2.5.2.3.1: **Verification of Own-Ship State Data Input Requirements (§2.2.2.3.1)** Test Tool Requirements: It will be necessary to be able to modify the injected scenarios used in this section to conduct negative tests to exercise data field values outside the expected values (e.g.) reserved values, to ensure that such data field values are properly handled by ASSAP as data not available. Test Procedure: Step 1. Inject Scenario 1-1 from section 2.5.6.1 as stimulus to ASSAP. Use 1090ES or UAT report format as appropriate for the installation.

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						Verify that appropriate Own-Ship State data appears on the CDTI interface. Interrupt the data input and verify that after the appropriate data age timeout for each of the data fields, with a timeout listed in Table L-1, on the CDTI interface that the data not available case is reflected. Repeat this step with a modified version of Scenario 1-1 where each data field that has reserved values has one of the reserved values set in a given ADS-B/TIS-B report in order to exercise each data field for those data fields that have reserved values. Verify that ASSAP treats any data field with a reported value outside the normal expected values as data not available.
372.	Burns	89	2.5.2.3.2	C	A test is needed for the requirement in section 2.2.2.3.2	Insert the following test in a newly created section 2.5.2.3.2: **Verification of Own-Ship Quality Data Input Requirements (§2.2.2.3.2)** Test Tool Requirements: It will be necessary to be able to modify the injected scenarios used in this section to conduct negative tests to exercise data field

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						values outside the expected values (e.g.) reserved values, to ensure that such data field values are properly handled by ASSAP as data not available. Test Procedure: Step 1. Inject Scenario 1-1 from section 2.5.6.1 as stimulus to ASSAP. Use 1090ES or UAT report format as appropriate for the installation. Verify that appropriate Own-Ship Quality data appears on the CDTI interface. Interrupt the data input and verify that after the appropriate data age timeout for each of the data fields, with a timeout listed in Table L-1, on the CDTI interface that the data not available case is reflected. Repeat this step with a modified version of Scenario 1-1 where each data field that has reserved values has one of the reserved values set in a given ADS-B/TIS-B report in order to exercise each data field for those data fields that have reserved values. Verify that ASSAP treats any data field with a reported value outside the normal expected values as data not available.

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373.	Burns	89	2.5.2.4	C	The tests referenced in this are incorrect. The pointer in this section should point to the appropriate CDTI tests in Section 2.6	Replace the existing text in section 2.5.2.4 with the following text: Verification is covered by the CDTI procedures in Section 2.6 that point to the requirements in Section 2.3.2.4.
374.	Petri		2.5.2.5	C	Text is not complete	
375.	Honeywell	89	2.5.2.5	S	This needs to be resolved prior to release of the document	Resolve **Tests added**
376.	Burns	89-90	2.5.2.5.1.1	C	A test is needed for the requirement in section 2.2.2.5.1.1	Insert the following test in a newly created section 2.5.2.5.1.1: **Verification of Traffic Output Capacity (§2.2.2.5.1.1)** Generate a scenario with at least 30 surface target elements and 30 airborne target elements. Verify at the CDTI interface that 30 surface target elements and 30 airborne target elements are received by the CDTI.
377.	Burns	89-90	2.5.2.5.1.10	C	A test is needed for the requirement in section 2.2.2.5.1.10	Insert the following test in a newly created section 2.5.2.5.1.10: **Verification of Traffic Altitude (§2.2.2.5.1.10)** Generate a scenario including airborne target elements that include Traffic Altitude information as pressure altitude, for some of

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						the traffic elements, and as relative altitude referenced from own-ship altitude for other traffic elements in the scenario. Verify at the CTDI interface that those elements with a pressure altitude were received with the pressure altitude information included. Verify at the CTDI interface that those elements with a relative altitude referenced from own-ship altitude were received with the relative altitude information included.
378.	Burns	89-90	2.5.2.5.1.11	C	A test is needed for the requirement in section 2.2.2.5.1.11	Insert the following test in a newly created section 2.5.2.5.1.11: **Verification of Traffic Geometric Altitude (§2.2.2.5.1.11)** Generate a scenario including airborne target elements with Traffic Geometric Altitude information included. Verify at the CTDI interface that those elements with a Traffic Geometric Altitude were received with the Traffic Geometric Altitude information included as Height above Ellipsoid (HAE) geometric altitude.
379.	Burns	89-90	2.5.2.5.1.12	C	A test is needed for the requirement in section 2.2.2.5.1.12	Insert the following test in a newly created section 2.5.2.5.1.12:

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						Verification of Traffic Track Angle (Traffic Directionality) (§2.2.2.5.1.12) Generate a scenario including surface target elements with Traffic Track Angle information included. Be sure to include some negative traffic elements with the track angle error greater than 30 degrees as defined in Appendix D of this document. Verify at the CTDI interface that those elements with a Traffic Track Angle were received with the Traffic Track Angle information included as true track angle. Verify at the CTDI interface that those elements with a Traffic Track Angle error greater than 30 degrees were marked as invalid for CDTI.
380.	Burns	89-90	2.5.2.5.1.13	C	A test is needed for the requirement in section 2.2.2.5.1.13	Insert the following test in a newly created section 2.5.2.5.1.13: **Verification of Traffic Vertical Direction (§2.2.2.5.1.13)** Generate a scenario including airborne target elements that include Traffic Vertical Direction information as vertical rate, for some of the traffic elements, and with an indication whether the traffic vertical direction is

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						climbing, descending, or level for other traffic elements in the scenario. Verify at the CTDI interface that those elements with a vertical rate were received with the vertical rate information included. Verify at the CTDI interface that those elements with an indication of whether the traffic vertical direction is climbing, descending, or level were received with this Vertical Direction information included. Verify for those traffic elements where ASSAP calculated the vertical direction that climbs were indicated when the positive vertical rate exceeded 500 fpm and that descents were indicated when the negative vertical rate exceeded 500 fpm.
381.	Burns	89-90	2.5.2.5.1.14	C	A test is needed for the requirement in section 2.2.2.5.1.14	Insert the following test in a newly created section 2.5.2.5.1.14: **Verification of Traffic Air/Ground Status (§2.2.2.5.1.14)** Generate a scenario including airborne and surface target elements with Traffic Air/Ground information included. Verify at the CTDI interface that those

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						elements with a Traffic Air/Ground status were received with the Traffic Air/Ground status information included.
382.	Burns	89-90	2.5.2.5.1.15	C	A test is needed for the requirement in section 2.2.2.5.1.15	Insert the following test in a newly created section 2.5.2.5.1.15: **Verification of Traffic TCAS Correlated Status (§2.2.2.5.1.15)** If TCAS is supported by ASSAP, generate a scenario including target elements with Traffic TCAS Correlated Status information included. Verify at the CTDI interface that those elements with a Traffic TCAS Correlated Status were received with the Traffic TCAS Correlated Status information included.
383.	Burns	89-90	2.5.2.5.1.16	C	A test is needed for the requirement in section 2.2.2.5.1.16	Insert the following test in a newly created section 2.5.2.5.1.16: **Verification of Traffic Application Capability (§2.2.2.5.1.16)** Generate a scenario including target elements that include Traffic Application Capability information as valid, for some of the traffic elements, and as invalid for other traffic elements in the scenario. Be sure to include at least one valid and one invalid traffic element for each available application whether active or not.

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						Verify at the CTDI interface that those elements with a valid indication were received with the Traffic Application Capability information marked as valid as appropriate for the application definitions defined in Section 2.2.2.5.1.16 of this document. Verify at the CTDI interface that those elements with an invalid indication were received with the Traffic Application Capability information marked as invalid as appropriate for the application definitions defined in Section 2.2.2.5.1.16 of this document.
384.	Burns	89-90	2.5.2.5.1.17	C	A place holder is needed for the requirement in section 2.2.2.5.1.17	Insert the following text in a newly created section 2.5.2.5.1.17: **Verification of Alert Output Requirements (§2.2.2.5.1.17)** No specific test procedure is required to validate §2.2.2.5.1.17.
385.	Burns	89-90	2.5.2.5.1.17 .1	C	A test is needed for the requirement in section 2.2.2.5.1.17.1	Insert the following test in a newly created section 2.5.2.5.1.17.1: **Verification of Traffic ASA Application Alerts (§2.2.2.5.1.17.1)** Case 1: Generate a scenario with a track that is

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						eligible for CD that is in a CAZ alert situation. Verify that a CAZ alert was issued for this track and that the status of this CAZ alert was reflected at the CDTI interface. Case 2: Generate a scenario with a track that is eligible for CD that is in a CDZ alert situation. Verify that a CDZ alert was issued for this track and that the status of this CDZ alert was reflected in at the CDTI interface.
386.	Burns	89-90	2.5.2.5.1.17.2	C	A test is needed for the requirement in section 2.2.2.5.1.17.2	Insert the following test in a newly created section 2.5.2.5.1.17.2: **Verification of Traffic TCAS Alert Status (§2.2.2.5.1.17.2)** Generate a scenario including target elements from ADS-B, ADS-R and TIS-B sources that are correlated with TCAS tracks and TCAS only tracks. Verify at the CTDI interface that those elements correlated with TCAS tracks were received with the Traffic TCAS Alert Status information included.
387.	Burns	89-90	2.5.2.5.1.17.3	C	A test is needed for the requirement in section 2.2.2.5.1.17.3	Insert the following test in a newly created section 2.5.2.5.1.17.3: **Verification of Traffic Emergency Priority**

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						Status (§2.2.2.5.1.17.3) If the CDTI uses the Emergency/Priority Status, generate a scenario including target elements with Emergency/Priority Status information included. Verify at the CTDI interface that those elements with an Emergency / Priority Status were received with the Emergency / Priority Status information included.
388.	Burns	89-90	2.5.2.5.1.2	C	A test is needed for the requirement in section 2.2.2.5.1.2	Insert the following test in a newly created section 2.5.2.5.1.2: **Verification of Traffic Output Priority (§2.2.2.5.1.2)** Generate a scenario that includes all of the elements in the following list as appropriate for the installation: 1. Resolution Advisory (for systems integrated with TCAS) 2. CD Warning Level Alerts (if implemented) 3. Traffic Advisory (for systems integrated with TCAS)

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						4. CD Caution Level Alerts (if implemented) 5. Airborne Proximate Traffic 6. CD Advisory Level Alerts (if implemented) 7. Coupled Traffic 8. Selected Traffic Verify at the CDTI interface that, when present in the input stream, the tracks with the above conditions were included as appropriate for the installation in order of priority from one to eight.
389.	Burns	89-90	2.5.2.5.1.3	C	A test is needed for the requirement in section 2.2.2.5.1.3	Insert the following test in a newly created section 2.5.2.5.1.3: **Verification of Track ID (§2.2.2.5.1.3)** Generate a scenario with multiple traffic elements. Design the scenario such that tracks are dropped and new tracks are added at intervals greater than 2 seconds and at intervals of less than 2 seconds as well. Verify at the CDTI interface that track numbers of dropped tracks were not reused on new tracks that began within 2 seconds of

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						dropped tracks that had those numbers and that new tracks that began after two seconds of the dropped tracks do reuse their track numbers.
390.	Burns	89-90	2.5.2.5.1.4	C	A test is needed for the requirement in section 2.2.2.5.1.4	Insert the following test in a newly created section 2.5.2.5.1.4: **Verification of Traffic Identification (§2.2.2.5.1.4)** Generate a scenario including traffic elements both with and without flight IDs. Verify at the CDTI interface that those elements with a Flight ID were received with the Flight ID included.
391.	Burns	89-90	2.5.2.5.1.5	C	A test is needed for the requirement in section 2.2.2.5.1.5	Insert the following test in a newly created section 2.5.2.5.1.5: **Verification of Traffic Category (Emitter Category) (§2.2.2.5.1.5)** Generate a scenario including traffic elements both with and without Traffic Category. Verify at the CDTI interface that those elements with a Traffic Category were received with the Traffic Category included.
392.	Burns	89-90	2.5.2.5.1.6	C	A test is needed for the requirement in section 2.2.2.5.1.6	Insert the following test in a newly created section 2.5.2.5.1.6: **Verification of Traffic Length/Width Codes**

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						(§2.2.2.5.1.6) Generate a scenario including surface target elements with Length and Width Codes. Verify at the CDTI interface that those elements with a Length and Width Code were received with the Length and Width Code included.
393.	Burns	89-90	2.5.2.5.1.7	C	A test is needed for the requirement in section 2.2.2.5.1.7	Insert the following test in a newly created section 2.5.2.5.1.7: **Verification of Traffic Horizontal Position (§2.2.2.5.1.7)** Generate a scenario including surface target elements that include Traffic Horizontal Position information as latitude/longitude, for some of the traffic elements, and as relative range and bearing referenced from own-ship position for other traffic elements in the scenario. Verify at the CTDI interface that those elements with a latitude/longitude were received with the latitude/longitude information included. Verify at the CTDI interface that those elements with a relative range and bearing

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						referenced from own-ship position were received with the relative range and bearing information included and defined as in Section 2.2.2.3.1 of this document.
394.	Burns	89-90	2.5.2.5.1.8	C	A test is needed for the requirement in section 2.2.2.5.1.8	Insert the following test in a newly created section 2.5.2.5.1.8: **Verification of Traffic Ground Speed (§2.2.2.5.1.8)** Generate a scenario including surface target elements with Ground Speed information included. Verify at the CTDI interface that those elements with a Ground Speed were received with the Ground Speed information included.
395.	Burns	89-90	2.5.2.5.1.9	C	A test is needed for the requirement in section 2.2.2.5.1.9	Insert the following test in a newly created section 2.5.2.5.1.9: **Verification of Traffic Closure Rate (§2.2.2.5.1.9)** Generate a scenario including traffic elements with Traffic Closure Rate information included for the coupled traffic elements in the scenario. Verify at the CTDI interface that those elements with a Traffic Closure Rate were received with the Traffic Closure Rate information included.

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						Verify that for those elements with a Traffic Closure Rate that were received, that those closure rates were determined based on slant range from own-ship position.
396.	Burns	89-90	2.5.2.5.2	C	A place holder is needed for the requirement in section 2.2.2.5.2	Insert the following text in a newly created section 2.5.2.5.2: **Verification of Own-ship Information Output Requirements (§2.2.2.5.2)** No specific test procedure is required to validate §2.2.2.5.2.
397.	Burns	89-90	2.5.2.5.2.1	C	A test is needed for the requirement in section 2.2.2.5.2.1	Insert the following test in a newly created section 2.5.2.5.2.1: **Verification of Own-ship Horizontal Position (§2.2.2.5.2.1)** Generate a scenario including target elements with Own-ship Horizontal Position information included. Verify at the CTDI interface that those elements with an Own-ship Horizontal Position were received with the Own-ship Horizontal Position information included based on WGS-84 latitude/longitude as per the requirements in Table 2-2 of this document.
398.	Burns	89-90	2.5.2.5.2.2	C	A test is needed for the requirement in section 2.2.2.5.2.2	Insert the following test in a newly created section 2.5.2.5.2.2:

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						Verification of Own-ship Ground Speed (§2.2.2.5.2.2) Generate a scenario including surface target elements with Own-ship Ground Speed information included. Verify at the CTDI interface that those elements with an Own-ship Ground Speed were received with the Own-ship Ground Speed information included as per the requirements in Table 2-2 of this document.
399.	Burns	89-90	2.5.2.5.2.3	C	A test is needed for the requirement in section 2.2.2.5.2.3	Insert the following test in a newly created section 2.5.2.5.2.3: **Verification of Own-ship Track Angle (§2.2.2.5.2.3)** Generate a scenario including surface target elements with Own-ship Track Angle information included. Be sure to include target elements with own-ship track angle error greater than 5 degrees and other target elements with own-ship track angle error greater than 30 degrees. Verify at the CTDI interface that those elements with an Own-ship Track Angle were received with the Own-ship Track Angle information included.

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						Verify that those elements with a track angle error greater than 5 degrees were marked as invalid by CDTI. Verify that those elements with a track angle error greater than 30 degrees were marked as invalid by CDTI if they were used to orient the own ship symbol.
400.	Burns	89-90	2.5.2.5.2.4	C	A test is needed for the requirement in section 2.2.2.5.2.4	Insert the following test in a newly created section 2.5.2.5.2.4: **Verification of Own-ship Pressure Altitude (§2.2.2.5.2.4)** Generate a scenario including surface target elements with Own-ship Pressure Altitude information included. If the CDTI uses actual altitude, then the surface target elements should have the barometric correction information included. Verify at the CTDI interface that those elements with an Own-ship Pressure Altitude were received with the Own-ship Pressure Altitude information included. Verify at the CTDI interface that for those elements with an Own-ship Pressure Altitude with the barometric correction information

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						were received barometric correction information included.
401.	Burns	89-90	2.5.2.5.2.5	C	A test is needed for the requirement in section 2.2.2.5.2.5	Insert the following test in a newly created section 2.5.2.5.2.5: **Verification of Own-ship Length/Width Codes (§2.2.2.5.2.5)** Generate a scenario including surface target elements with Own-ship Length/Width Code information included. Verify at the CTDI interface that those elements with an Own-ship Length/Width Code were received with the Own-ship Length/Width Code information included.
402.	Burns	89-90	2.5.2.5.3	C	A place holder is needed for the requirement in section 2.2.2.5.3	Insert the following text in a newly created section 2.5.2.5.3: **Verification of ASSAP Status Output Requirements (§2.2.2.5.3)** No specific test procedure is required to validate §2.2.2.5.3.
403.	Burns	89-90	2.5.2.5.3.1	C	A test is needed for the requirement in section 2.2.2.5.3.1	Insert the following test in a newly created section 2.5.2.5.3.1: **Verification of ASA Application Status (§2.2.2.5.3.1)** Generate a scenario including target elements with ASA Application Status information

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						included. Be sure to include one target element with each of the five possible states defined in Section 2.2.2.5.3.1 of this document. Verify at the CTDI interface that those elements with an ASA Application Status were received with the ASA Application Status information included and that all five states were exercised in the scenario.
404.	Burns	89-90	2.5.2.5.3.2	C	A test is needed for the requirement in section 2.2.2.5.3.2	Insert the following test in a newly created section 2.5.2.5.3.2: **Verification of ASSAP Fault (§2.2.2.5.3.2)** Generate a scenario including target elements with an ASSAP fault indication included as per the requirements in Section 2.2.5 of this document. Verify at the CTDI interface that those elements with an ASSAP fault were received with the ASSAP fault indicated.
405.	Burns	90	2.5.2.6	C	A capacity case is needed for this test	Add the following step to the current test procedure in section 2.5.2.6: Step 3 Generate a Capacity Scenario of 130 traffic elements, if CD is supported by ASSAP or of 60 traffic elements otherwise from ADS-B, ADS-R and TIS-B sources. Add an addition 30 TCAS tracks if ASSAP supports

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						TCAS. Verify ASSAP processes all ADS-B, ADS-R and TIS-B reports as well as all TCAS data and outputs correlated tracks within the 2.0 second latency requirement.
406.	Burns	90	2.5.3.1	C	This test has been over taken by events	Remove the test procedure in this section and insert the following: No specific test procedure is required to validate §2.2.3.1.
407.	Burns	90-91	2.5.3.1.1	C	Section 2.2.3.1.1 needs to be renamed and the procedure needs to be replaced with another one.	Rename section 2.5.3.1.1 and insert the following: **Verification of Track Initiation (§2.2.3.1.1)** Test Tool Requirements: This test will require the generation of scenarios for use as truth data. Test Procedure: Generate a scenario including ADS-B, ADS-R and TIS-B sources. Verify that reports for which there was no existing track, ASSAP began the track initiation process for the following: a. ADS-B and ADS-R reports,

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						regardless of address type. b. TIS-B reports received in an own-ship when on the surface. c. TIS-B reports received in an airborne own-ship that is not TCAS equipped. d. TIS-B reports received on surface A/Vs in an airborne own-ship that is TCAS equipped.
408.	Burns	91	2.5.3.1.2	C	A test is needed for the requirement in section 2.2.3.1.2	Insert the following test in a newly created section 2.5.3.1.2: **Verification of Track Storage (§2.2.3.1.2)** Test Tool Requirements: This test will require the generation of scenarios for use as truth data. Be sure to include a capacity scenario ramping up to more than 130 tracks if CD is included and more than 60 tracks otherwise. If TCAS is also supported then an additional 30 TCAS Tracks should be added to the capacity scenario.

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						Test Procedure: Generate the appropriate capacity scenario for the ASSAP. Verify that ASSAP maintained at least 60 source tracks (130 if CD is implemented) plus 30 more tracks if TCAS is also supported by ASSAP.
409.	Burns	91	2.5.3.1.3	C	A place holder is needed for the requirement in section 2.2.3.1.3	Insert the following text in a newly created section 2.5.3.1.3: No specific test procedure is required to validate §2.2.3.1.3.
410.	Burns	91-92	2.5.3.1.3.1	C	A test is needed for the requirement in section 2.2.3.1.3.1	Insert the following test in a newly created section 2.5.3.1.3.1: **Verification of Report Validity (§2.2.3.1.3.1)** Test Tool Requirements: This test will require the generation of scenarios for use as truth data. Test Procedure: Generate a scenario including ADS-B, ADS-R and TIS-B sources. Verify that for each traffic element in the scenario that the Horizontal and Vertical

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						Position and Rate tests defined in §2.2.3.1.3.1 were satisfied and that ASSAP updated the report with the data.
411.	Burns	92	2.5.3.1.3.2	C	A test is needed for the requirement in section 2.2.3.1.3.2	Insert the following test in place of the existing test in section 2.5.3.1.3.2: **Verification of Duplicate Address (UAT Systems Only) (§2.2.3.1.3.2)** Test Tool Requirements: This test will require the generation of scenarios with some duplicate addresses deliberately included. Test Procedure: Generate a scenario being sure to include some traffic elements with duplicate addresses. Verify that for reports for which there was no track created as a result of duplicate address processing with a matching participant address and ADS-B source, that ASSAP began the track initiation process. Verify that for each report containing an updated position and/or velocity, and where there was an existing track created as a result of duplicate address processing with the same participant address, that ASSAP updated that

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						track with the report only when it passed the Report Validity Tests defined in §2.2.3.1.3.1.
412.	Burns	92	2.5.3.2.1	C	A place holder is needed for the requirement in section 2.2.3.2.1	Insert the following text in the existing section 2.5.3.2.1: No specific test procedure is required to validate §2.2.3.2.1.
413.	Burns	92	2.5.3.2.1.1	C	A test is needed for the requirement in section 2.2.3.2.1.1	Insert the following test in the newly created section 2.5.3.2.1.1: **Verification of Inter-Source Correlation of TIS-B with ADS-B/ADS-R Tracks Using an ICAO Address Match (§2.2.3.2.1.1)** <u>Test Procedure for 24 bit address correlation</u>: Step1. Inject Scenario 1-4a from section 2.5.6.1 as stimulus to ASSAP including own-ship trajectory but without the TCAS source. Use 1090ES or UAT report format as appropriate for the installation. After the first update is received from either source, verify there are no missed correlations between ADS-B and TIS-B for track 1A. Verify that each TIS-B track update passes the Correlation Window Tests defined in §2.2.3.2.1.3 when referenced to the ADS-B/ADS-R track.

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414.	Burns	93-94	2.5.3.2.1.2	C	A test is needed for the requirement in section 2.2.3.2.1.2	Insert the following test in the newly created section 2.5.3.2.1.2: **Verification of Inter-Source Correlation of TIS-B with ADS-B/ADS-R Tracks Using Spatial Correlation (§2.2.3.2.1.2)** <u>Test Procedure for spatial correlation (if implemented):</u> Step1. Inject Scenario 1-4b from section 2.5.6.1 as stimulus to ASSAP including own-ship trajectory, but without the TCAS source. Use 1090ES or UAT report format as appropriate for the installation. After the 3rd TIS-B update, verify there are no missing correlations or correlations with the wrong aircraft between ADS-B and TIS-B. Verify that each TIS-B track update passes the Correlation Window Tests defined in §2.2.3.2.1.3 when referenced to the ADS-B/ADS-R track. Step 2: Inject Scenario 2-3 from Section 2.5.6.2 as stimulus to ASSAP including own-ship trajectory. Use 1090ES or UAT report format as appropriate for the installation.

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						After the 3rd TIS-B update, verify there are no missing correlations between track 2B (ADS-B) and 2B (TIS-B). Verify that each TIS-B track update passes the Correlation Window Tests defined in §2.2.3.2.1.3 when referenced to the ADS-B/ADS-R track. Step 3. Inject Scenario 2-4 from Section 2.5.6.2 as stimulus to ASSAP including own-ship trajectory, but without TCAS source. Use 1090ES or UAT report format as appropriate for the installation. Verify there are no false correlations between traffic elements 2A (ADS-B) and 2B (TIS-B). Verify that each TIS-B track update passes the Correlation Window Tests defined in §2.2.3.2.1.3 when referenced to the ADS-B/ADS-R track. Step 4: Inject Scenario 3-3 from Section 2.5.6.3 as stimulus to ASSAP including own-ship trajectory. Use 1090ES or UAT report format as appropriate for the installation. After the 3rd TIS-B update, verify there are no missing correlations between track 3B (ADS-

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						B) and 3B (TIS-B). Verify that each TIS-B track update passes the Correlation Window Tests defined in §2.2.3.2.1.3 when referenced to the ADS-B/ADS-R track. Step 5. Inject Scenario 3-4 from Section 2.5.6.3 as stimulus to ASSAP including own-ship trajectory, but without TCAS source. Use 1090ES or UAT report format as appropriate for the installation. Verify that each TIS-B track update passes the Correlation Window Tests defined in §2.2.3.2.1.3 when referenced to the ADS-B/ADS-R track. Verify there are no false correlations between traffic elements 3A (ADS-B) and 3B (TIS-B). Step 6. Inject Scenario 4-1 from section 2.5.6.4 as stimulus to ASSAP including own-ship trajectory, but without TCAS source. Use 1090ES or UAT report format as appropriate for the installation. Verify all reports correlate with the correct source track. Verify that each TIS-B track update passes the

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						Correlation Window Tests defined in §2.2.3.2.1.3 when referenced to the ADS-B/ADS-R track.
415.	Burns	94	2.5.3.2.1.3	C	A place holder is needed for the requirement in section 2.2.3.2.1.3	Insert the following text in the existing section 2.5.3.2.1.3: **Verification of Correlation Window Tests for Inter-Source Correlation of TIS-B with ADS-B/ADS-R Tracks (§2.2.3.2.1.3)** No specific test procedure is required to validate §2.2.3.2.1.3.
416.	Burns	94	2.5.3.2.2	C	A place holder is needed for the requirement in section 2.2.3.2.2	Insert the following text in the existing section 2.5.3.2.2: No specific test procedure is required to validate §2.2.3.2.2.
417.	Burns	94	2.5.3.2.2.1	C	A test is needed for the requirement in section 2.2.3.2.2.1	Insert the following test in the newly created section 2.5.3.2.2.1: **Verification of Inter-Source Correlation of TIS-B with Own-ship Using an ICAO Address Match (§2.2.3.2.2.1)** <u>Test Procedure for 24 bit address correlation</u>: Step1. Inject Scenario 1-6 from section 2.5.6.1 as stimulus to ASSAP including own-ship trajectory. Use 1090ES or UAT report format as appropriate for the installation.

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						Verify that correlation of TIS-B and own-ship is established upon the 1st TIS-B update and remains through the scenario. Verify that each TIS-B track update passes the Correlation Window Tests defined in §2.2.3.2.2.3 when referenced to the ADS-B/ADS-R track.
418.	Burns	94-95	2.5.3.2.2.2	C	A test is needed for the requirement in section 2.2.3.2.2.2	Insert the following test in the newly created section 2.5.3.2.2.2: **Verification of Inter-Source Correlation of TIS-B with Own-ship Using Spatial Correlation (§2.2.3.2.2.2)** <u>Test Procedure for spatial correlation</u>: Step1. Inject Scenario 1-5 from section 2.5.6.1 as stimulus to ASSAP including own-ship trajectory. Use 1090ES or UAT report format as appropriate for the installation. After the 3rd TIS-B update, verify there are no missing correlations or correlations with the wrong aircraft between own-ship and TIS-B. Verify that each TIS-B track update passes the Correlation Window Tests defined in §2.2.3.2.2.3 when referenced to the ADS-B/ADS-R track.

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						Step 2. Inject Scenario 2-2 from Section 2.5.6.2 as stimulus to ASSAP including own-ship trajectory, but without TCAS source. Use 1090ES or UAT report format as appropriate for the installation. Verify there are no false correlations between TIS-B and own-ship. Verify that each TIS-B track update passes the Correlation Window Tests defined in §2.2.3.2.2.3 when referenced to the ADS-B/ADS-R track. Step 3. Inject Scenario 3-2 from Section 2.5.6.3 as stimulus to ASSAP including own-ship trajectory, but without TCAS source. Use 1090ES or UAT report format as appropriate for the installation. Verify there are no false correlations between TIS-B and own-ship. Verify that each TIS-B track update passes the Correlation Window Tests defined in §2.2.3.2.2.3 when referenced to the ADS-B/ADS-R track.
419.	Burns	95	2.5.3.2.2.3	C	A place holder is needed for the requirement in section 2.2.3.2.2.3	Insert the following text in the newly created section 2.5.3.2.2.3:

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						No specific test procedure is required to validate §2.2.3.2.2.3.
420.	Burns	95	2.5.3.2.3	C	A place holder is needed for the requirement in section 2.2.3.2.3	Insert the following text in the existing section 2.5.3.2.3: No specific test procedure is required to validate §2.2.3.2.3.
421.	Burns	95-96	2.5.3.2.3.1	C	A test is needed for the requirement in section 2.2.3.2.3.1	Insert the following test in the newly created section 2.5.3.2.3.1: **Verification of Inter-Source Correlation of TCAS with ADS-B/ADS-R/TIS-B Tracks Using an ICAO Address Match (§2.2.3.2.3.1)** Step 1 Inject Scenario 4-1 from section 2.5.6.4 as stimulus to ASSAP including own-ship trajectory. Use 1090ES or UAT report format as appropriate for the installation. Verify the following: • 100% of all TCAS reports without a 24 bit address correlate with the correct ADS-B / ADS-R / TIS-B track within 5 TCAS updates. • 100% of all TCAS

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						reports with a 24 bit address correlate with the correct ADS-B / ADS-R / TIS-B track with the first TCAS update. There are no missed correlations after correlation is achieved.
422.	Burns	96	2.5.3.2.3.2	C	A test is needed for the requirement in section 2.2.3.2.3.2	Insert the following test in the newly created section 2.5.3.2.3.2: **Verification of Inter-Source Correlation of TCAS with ADS-B/ADS-R/TIS-B Tracks Using Spatial Correlation (§2.2.3.2.3.2)** Test Procedure: Step 1. Inject Scenario 1-1 from section 2.5.6.1 as stimulus to ASSAP including own-ship trajectory. Use 1090ES or UAT report format as appropriate for the installation. After the 3rd TCAS update, verify that are no missed correlations between ADS-B and TCAS. Verify that each TCAS track update passes the Correlation Window Tests defined in §2.2.3.2.3.3 when referenced to the ADS-B

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						track. Step 2. Inject Scenario 1-2 from section 2.5.6.1 as stimulus to ASSAP including own-ship trajectory. Use 1090ES or UAT report format as appropriate for the installation. After the 3rd TCAS update, verify there are no missed correlations between ADS-R and TCAS. Verify that each TCAS track update passes the Correlation Window Tests defined in §2.2.3.2.3.3 when referenced to the ADS-R track. Step 3. Inject Scenario 1-3 from section 2.5.6.1 as stimulus to ASSAP including own-ship trajectory. Use 1090ES or UAT report format as appropriate for the installation. After the 3rd TCAS update, verify there are no missed correlations between TIS-B and TCAS. Verify that each TCAS track update passes the Correlation Window Tests defined in §2.2.3.2.3.3 when referenced to the TIS-B track. Step 4. Inject Scenario 2-4 from Section

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						2.5.6.2 as stimulus to ASSAP including own-ship trajectory. Use 1090ES or UAT report format as appropriate for the installation. After the 3rd TCAS update occurs for both tracks 2A and 2B, verify the following: • No missed correlations between 2B (TIS-B and TCAS) and between 2A (ADS-B and TCAS). • No false correlations of TCAS updates across tracks 2A/2B. Step 5. Inject Scenario 3-4 from Section 2.5.6.3 as stimulus to ASSAP including own-ship trajectory. Use 1090ES or UAT report format as appropriate for the installation. After the 3rd TCAS update occurs for both tracks 3A and 3B, verify the following: • No missed correlations between 3B (TIS-B and TCAS) and between 3A (ADS-B and TCAS). No false correlations of TCAS updates across tracks 3A/3B

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423.	Burns	98-99	2.5.4.1.2	E	The 25 seconds in the last sentence of case 2 in section 2.5.4.1.2 needs to be changed to 26 seconds	Replace the 25 with a 26 in the last sentence of case 2 in section 2.5.4.1.2.
424.	R. Brandao	100	2.5.4.4.1	S	In case 6 own-ship integrity requirement for ASSAP is listed as 0.2 NM while table 2.2 indicates 0.5 NM.	Change the number to 0.5 NM. **ACCEPT**
425.	R. Brandao	99	2.5.4.4.1	S	Case 3 uses an accuracy limit of 0.1 NM for own position while table 2-2 indicates the limit is 0.3 NM – this is inconsistent. Also is the use of term "uncertainty" correct – should it not be accuracy?	Change 0.1 NM to 0.3 NM in case 3 to match table 2-2. **ACCEPT**
426.	Burns	112	2.6	C	The CDTI Table 2-8 that maps the test sections to the requirements sections is incomplete.	Fill in the blank boxes in the table with the appropriate test sections for each requirement.
427.	Burns	112-153	2.6	C	There should be hyperlinks in the CDTI test section pointing back to the CDTI requirements sections satisfied by each particular test in the test section.	Add hyperlinks to the CDTI test section with the appropriate links to the requirements section.
428.	AIR-130	130	2.6.1	S	Believe there should be a test for display orientation annunciation, after a (simulated) TCAS RA. The point is to exercise the display logic to ensure it performs as expected.	Add a test for display orientation annunciation, after a (simulated) TCAS RA.
429.	Honeywell	143	2.6.2.11	S	Last bullet – do not put requirements into tests	Remove the **shall**
430.	Honeywell	143	2.6.2.12	S	3.a – remove this silly test (and its associated requirement)	Change as proposed
431.	Honeywell	145	2.6.2.16	S	Part 4 is incomplete	Finish before the release of this document

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432.	Honeywell	138	2.6.2.4.4	S	I don't believe an arrow is required symbology, why the verification of an arrow?	Don't create requirements in tests.
433.	Honeywell	139	2.6.2.5	E	+/- 99 knots does not match requirement (three places)	
434.	Honeywell	146	2.6.3.1	S	Where does the "300ms update rate" come from? I've not seen it as a requirement elsewhere in the document.	Don't create requirements in tests.
435.	Honeywell	149	2.6.3.16	S	There are no letters associated with the steps of SETUP or RESPONSE	Bullets should probably be letters
436.	Honeywell	150	2.6.3.16	S	Highlighted text (2 places) – this test is incomplete	Complete it
437.	Honeywell	150	2.6.3.16	S	2nd bullet under SETUP – after disconnecting TCAS from CDTI/ASSAP, will the following steps have any effect?	
438.	Honeywell	146	2.6.3.2	S	Where does the "500ms update rate" come from? I've not seen it as a requirement elsewhere in the document.	Don't create requirements in tests.
439.	Joel Wichgers	153	3	E	Editorial. Standard MOPS section naming guidelines is that section 3 is entitled "Installed Equipment Performance Requirements".	Change the title as follows: "**3 Installed Equipment Performance Requirements**"
440.	Joel Wichgers	153	3.1.4	S	The title "Dynamic Range" is not a good title, as dynamic range is a term that is used to describe the sensitivity of communication receivers.	Change the title for this section as follows: "**3.1.4 ~~Dynamic Range~~ Dynamics Environment**" ACCEPTED DONE

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441.	Honeywell	154	3.1.6	S	There is a requirement (**shall**) in the note.	Albeit the "requirement" is very nebulous, but if it is intended to be a requirement, take it out of the note ACCEPT
442.	Joel Wichgers	153	3.1.9	C	DO-257A defines the requirements for airport surface moving map. Re-defining these requirements is not within the scope of SC-186. The proposed note is not consistent with DO-257A, which defines the requirements (including own-ship requirements) for the Aerodrome Moving Map Display. The chairman of the working group who led the development of RTCA DO-257A (Aerodrome Moving Map Display) requirements disagrees with the proposal to change the allocation to the own-ship horizontal position accuracy. We discussed the proposal, and agreed that it is not valid to "de-RSS" the error sources and re-allocate error from the map to the own-ship position. There is a fundamental difference between a position bias that is noted, the map provider is told about it, and he corrects the airport mapping in the next release of the database, versus a significantly larger random error source that is always present	Change the note as follows: *Note: The horizontal position accuracy requirement for ~~ownship~~ own-ship for ASSA/FAROA ~~(of 74 m) in Table 2-2 is derived based on having the medium data quality or better for the airport surface map data base. See also~~ are based upon DO-257A for the Aerodrome Moving Map Display~~, Section 3.2.3 for notes on system accuracy quotas~~. Additional ASSA/FAROA requirements are specified elsewhere in this document."*

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					that is caused by own-ship position uncertainties. Root sum squaring (RSS) only works when the error sources are Gaussian, or when there are very many error sources, where no individual error source dominates. That is clearly not the case.	
443.	Honeywell	155	3.2	E	Last sentence has an extra carriage return / line feed.	Remove the CR/LF.
444.	Joel Wichgers	155	3.3.1	E	Editorial.	Replace DO-160D with DO-160E, for consistency with the rest of the document.
445.	Honeywell	155	3.3.1	S	Now you've reverted back to DO-160D.	Use DO-160F
446.	Honeywell	157	3.4.2.2	S	Not specifying the "minimum necessary to determine if the following design goals have been met" will lead to arguments with regulatory agencies over what constitutes the "minimum"	TCAS specifies 10,000 track seconds for ATCRBS and 5,000 track seconds for Mode S. Pick such a number for this flight test. **We accept 5000 track seconds will add not that it may be unrealistic until more equipage occurs.**
447.	Honeywell	158	3.4.2.2	S	Are the "0% miscorrelation rates" (while using the spatial correlation techniques) realistic?	TCAS allows a certain percentage of false tracks and missing tracks. Should not these applications? **ACCEPT—rewriting this section**
448.	Joel Wichgers	A-1	Appendix A	E	Editorial.	AC stands for "Advisory Circular", not "~~Aviation~~ Circular".
449.	Joel Wichgers	A-2	Appendix A	E	Editorial.	Delete the inadvertent "," at the end of the line defining the "RA Resolution Advisory" acronym.
450.	Joel Wichgers	A-3	Appendix A	E	Editorial. In the definition of the acronym "TCAS", it says to "(See ACAS)". ACAS	Either: 1) delete "(See ACAS)" in the TCAS acronym list, or 2) add ACAS to both the

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					is not defined or discussed in the appendix, so the reference is not clear. Either define ACAS in the appendix or delete the reference.	acronym list and the definition list.
451.	Joel Wichgers	A-3	Appendix A	E	Editorial. VEPU acronym is not correct.	Revise VEPU acronym to be: "Vertical Estimated Position Uncertainty"
452.	Honeywell	A-3	A.1	E	The reference for TCAS states "(See ACAS)". There is no entry for ACAS	Add an entry for ACAS
453.	Honeywell	A-4	A.2	E	Where is the "bibliography in Appendix AB"?	
454.	AIR-130	A-5	Apdx A	E	CDTI definition should include the short definition stated in the beginning of section 2.3 (such as plan view graphical display).	Modify definition to match that defined in beginning of 2.3.
455.	Honeywell	A-5	A.2	E	Might want to add "compass rose" to Appendix A.2	Change as proposed
456.	Joel Wichgers	A-6	Appendix A	E	Editorial. In the definition of domain, 5 domains are defined (rather than 4 domains) including: 1) surface, 2) terminal, 3) en-route, 4) oceanic/remote, and 5) uncontrolled. It looks like 4 were originally defined, but then "uncontrolled" was added for a fifth domain.	In the definition of "Domain", change the second sentence as follows: "Generally there are ~~four~~ five domains: surface, terminal, en route, ~~and~~ oceanic/remote and uncontrolled."
457.	Honeywell	A-7	A.2	E	Remove the note under "Enhanced Visual Acquisition (EVAcq)". A similar note appears under "Extended Display Range" and it makes more sense there.	
458.	Joel	A-8	Appendix	S	Horizontal Velocity from GPS or Inertial	Change the definition of velocity to be

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	Wichgers		A		systems is not relative to a ground reference. Neither of these two systems have terrain models and project the speed to the equivalent speed over the ground. They also do not project the speed to a MSL or WGS-84 ellipsoid reference surface. What they do output is velocity in local horizontal plane. The definition proposed is based upon the definition in Appendix A of the GPS/GRAS MOPS (DO-310).	consistent with what is provided by aircraft navigation sensors (e.g., GPS and inertial) and transponders: "~~The horizontal component of velocity relative to a ground reference (see *Velocity*).~~Horizontal velocity is the component of velocity in a local horizontal plane. For GPS sensors, that plane is tangent to the WGS-84 ellipsoid and is vertically displaced such that it contains the navigation sensor's reference point. For INS systems, the local plane is tangent to the local gravity vector." **ACCEPT—Joel will add commentary on what needs to be considered to get to ground speed.**
459.	Joel Wichgers	A-9	Appendix A	E	Editorial.	Correct the font on the "p" for NACp and "v" for NACv (currently spelled out as "NACP" and "NACV").
460.	Joel Wichgers	A-9	Appendix A	S	Suggest that we clarify the definition of NIC in a manner that it will be consistent with that which has been harmonized as part of the following RTCA standards: DO-260, DO-260A, DO-282, DO-282A, DO-242, DO-242A, DO-289, and DO-302.	Change the definition as follows (based upon the harmonized change definitions put into all of the relevant SC-186 standards in October 2006): "The NIC parameter describes an integrity containment region about the reported position, within which the true position of the surveillance position reference point is assured to lie at the reported time of applicability. For

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						the conditions and probability of assurance associated with the integrity containment region, see the SIL parameter.” **ACCEPT**
461.	Joel Wichgers	A-10	Appendix A	E	Editorial. The term “registration” is not used. So, it should be removed from the appendix.	Delete the term and definition of “registration”.
462.	Joel Wichgers	A-11	Appendix A	E	Editorial. The definition of “Separation” has some extraneous words.	Change the definition as follows: “**Separation -** ~~Requirements or Separation Standards~~ The minimum distance between aircraft/vehicles allowed by regulations. Spacing requirements vary by various factors, such as radar coverage (none, single, composite), flight regime (terminal, en route, oceanic), and flight rules (instrument or visual).”
463.	Joel Wichgers	A-11	Appendix A	C	The definition of SIL is not consistent with that which has been harmonized as part of the changes to following RTCA standards: DO-260, DO-260A, DO-282, DO-282A, DO-242, DO-242A, and DO-289, as well as the initial release of DO-302. The term “airborne equipment condition” is not clear as to what it is referring to, and will be misinterpreted.	Change the definition of SIL as follows: “**Surveillance Integrity Level (SIL) -** The Surveillance Integrity Level (SIL) defines the probability of the integrity containment region that is ~~indicated~~ described by the NIC parameter being exceeded, without alerting, ~~including the effects of the airborne equipment condition~~ for the selected geometric position source, including any external signals used by that source. The probability specified by the SIL parameter is the largest likelihood of any one of the following occurring when a valid

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						geometric position is provided by the selected position source: a. a position source equipment malfunction (per hour) b. the per sample probability of a position source error larger than the horizontal or vertical integrity containment region associated with the NIC value(s), or, c. for GNSS, the probability of the signal-in-space causing a position error larger than the horizontal or vertical containment region associated with the NIC value(s) without an indication with a time period determined by the positioning source." **ACCEPTED**
464.	Joel Wichgers	A-13	Appendix A	S	The reference frame for the reported horizontal velocity is not WGS-84. It is a local horizontal reference frame for GPS and inertial navigation sensors. What is this frame? It is not supplied by any navigation system. GPS position sources provide a horizontal velocity in a local reference. Horizontal velocity is the component of velocity in a local horizontal plane. For GPS sensors, that local horizontal plane is	Change as follows: "**Velocity -** The rate of change of position. Horizontal velocity is the horizontal component of velocity and vertical velocity is the vertical component of velocity. ~~In these MASPS, velocity is always expressed relative to a frame of reference, such as the WGS-84 ellipsoid~~" ACCEPT

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					tangent to the WGS-84 ellipsoid and is vertically displaced such that it contains the navigation sensor's reference point. For INS systems, the local plane is tangent to the local gravity vector.	
465.	Honeywell	B-1	Appendix B	E	Is this a TCAS-ADS-B or TCAS/ASAS relationship? Appendix title doesn't match title on page B-1	Resolve.
466.	Joel Wichgers	C-5	Appendix C Table C-1	S	Table C-1 is an old version of the NACp table that has been superseded with the NIC/NAC/SIL harmonization that took place with all the relevant SC-186 documents in October 2006 (including DO-260, DO-260A, DO-282, DO-282A, DO-242, DO-242A, DO-289, and DO-302).	Use the new NACp table that resulted from change 1 to DO-289. It essentially deletes the "Comment" column of the table. ACCEPT
467.	Honeywell	C-28	C.3.2.2.1	S	σ_2 indicates a standard deviation for TCAS range error. Does this take TCAS's 100-ft vertical tracker into account? Not all altitude reports given to TCAS are 25-ft resolution.	Investigate. YES—100' is accounted for.
468.	Honeywell	C-31	C.3.2.2.2 Note	S	Do you believe that a TCAS bearing error observed on one aircraft is indicative of all aircraft installations? Experience has shown that antenna placement and aircraft type are huge factors in TCAS bearing error.	**Change made to clarify what we did. Test scenarios use a TCAS model considering various aircraft and antenna placements.**
469.	Joel Wichgers	C-40	Appendix C.3.4	S	This section has not been updated to the latest "Best Source Selection" logic in the	Update section C.3.4 to be identical to the source selection logic specified in §2.2.3.3.

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					§2.2.3.3.	**ACCPET**
470.	AIR-130	D-1	Apdx D	E	The title does not accurately reflect the content.	Change title to something like, "Effect of Velocity Errors on Traffic Track Angle Accuracy"
471.	Joel Wichgers	D-1	Appendix D	S	This Appendix should be named "Track Uncertainty" and not "Heading Error". It is discussing resolving NS and EW velocities into a track angle, and understanding the uncertainty of the track angle that is determined based upon understanding the horizontal velocity uncertainty.	If this appendix is retained, change the title from "~~Heading Error~~" to Track Uncertainty". **Being covered under another comment**
472.	Joel Wichgers	All	Appendix D	C	Appendix D is not an appropriate means to establish whether or not the track angle that is derived from horizontal velocities is good enough for the situational awareness applications, except perhaps for helicopter targets. Above a speed of TBD knots, all that should be necessary is that the horizontal position and horizontal velocity information are valid, to be acceptable for directionality. If the target is transmitting a surface message, then the traffic vehicle's ADS-B Out should be required to decide when the track angle uncertainty or heading uncertainty is too great to set the Heading field as valid.	Remove Appendix D. It is not appropriate technical guidance to establish the suitability velocity to support the track uncertainty. **Jonathan will generate a 5 deg table and a 30 deg table.**

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					For own-ship, the validity should not be based upon NACv. It should be based on the velocity FOMs (if available). Thus, the entire appendix really has no utility for ASSAP. It really may have more utility to ADS-B Out (DO-242A). I disagree with the Figures should be used as the basis for determining the ground speed at which the directionality uncertainty gets too large and several statements made in the appendix: > Figure D-2 is not technically correct. I technically disagree with the curves. > Figure D-2 is not labeled correctly, including the title and y-axis ("Course Error" should be "Course Uncertainty (95%)"). > [statement in 1st paragraph] "The results in this appendix allowed the operational community to select appropriate limits on velocity accuracy to support various surface applications contained in this MOPS." > [statement at the bottom of page D-1] "Figure D-1 below shows the 95% course error as a function of varying NACv and	

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					ground speed for assuming that the NACv describes a Gaussian distributed random error in velocity." The velocity error is not Gaussian. > Figure D-1 is not labeled correctly. I assume that you mean the "y" axis is "Track Uncertainty (95%)". If a manufacturer knew what the error was, he would take it out. Furthermore, NACv=1 should also be added to the Figure.	
473.	Honeywell	F-3	F.2.2.2	E	Why is "NACp = 7," highlighted?	Resolve
474.	AIR-130	G-2	G.2.3	E	Intent not adequately captured in last sentence.	Delete this last part of sentence: "so there seems to be no benefit to maintaining the TCAS symbology."
475.	Terry Abbott	G-2	G.2.3	E	To be consistent with previously stated requirements, change "traffic symbol may not drop directionality during a TCAS traffic and resolution advisories" to "traffic symbol shall not drop directionality during a TCAS traffic and resolution advisories"	See comment.
476.	Honeywell	G-2	G.3	E	"On one hand, It is…" should be "On one hand, it is…"	Change as proposed

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477.	Terry Abbott	G-2	G.3	E	The paragraph "On one hand, It is likely beneficial to limit the number of different symbols used. On the other hand, differentiating ASAS alert symbols from TCAS alert symbols can help to ensure the effectiveness of each" provides nothing to the reader.	Delete the paragraph.
478.	AIR-130	G-2	G.5	E	Reference to the ASAS MOPS is not needed. This appendix IS in the ASAS MOPS!	Delete "The ASAS MOPS" in the second sentence, to say, "Section 2.3.5.1 suggests:". (Changes are also needed in other parts of Appendix G).
479.	AIR-130	G-3	G.7 (all)	E	*Proximate* is an official TCAS term in this context, so it should be at least capitalized.	Capitalize "Proximate".
480.	AIR-130	G-3	G.7.2	E	This can be misunderstood that ASAS proximate and TCAS Proximate need to be *mutually* distinguished.	Change to: The ASAS MOPS Section 2.3.4.2.3.2(d) specifies that Proximate traffic (both TCAS and ADS-B source) should be distinguished **from other traffic** on a shared display, but does not require any specific symbology.
481.	Honeywell	G-3	G.7.3	E	"a TCAS TA and RA" should be "a TCAS TA or RA"	Change as proposed
482.	Honeywell	G-3	G.7.3	S	Section 2.3.1.1(b) does not require all proximate traffic to be displayed in the event of a TCAS TA or RA. They are required to be present at all times. If proximate traffic is only meant to be displayed with a TA/RA, the 2.3.1.1(b) needs to be re-written.	

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483.	Honeywell	H-1	H.1	E	Why is "15" highlighted?	Resolve
484.	Honeywell	H-2	H.1	E	Why is 60 highlighted?	Resolve
485.	AIR-130	H-3	Apdix H, Fig H-1	S	Messages in illustration may not be clear to a pilot.	Change messages to be sufficiently clear to a pilot (get input from CDTI subgroup), such as "Traffic Service: YES" or "Traffic Service: NO"
486.	Honeywell	I-1	I.2	E	Fourth bullet – not sure what is meant by "TCAS messages transmitted from other nearby aircraft"	Clarify
487.	Honeywell	I-2	I.2.1.2	E	Resolve highlighted (See Ref XX)	
488.	Honeywell	I-4	I.2.2.2.1	E	Resolve highlighted Ref XX	
489.	Honeywell	I-6	I.2.4	E	Resolve highlighted reference and/or more detail from MITRE	
490.	Honeywell	I-6	I.3	E	Resolve highlighted XXXX and to XXXX	
491.	Honeywell	J-1		E	This justification is not necessary.	Delete Appendix
492.	Honeywell	App. J	Title page	E	Is the title for Appendix J "TARGET SCENARIO FOR TESTING"? It looks like the appendix in about latency.	
493.	Honeywell	J-1	2nd, 3rd, paragraph	E	Are the references in these paragraphs to DO-289 or the current MOPS?	Clarify
494.	Joel Wichgers	All of J	Appendix J	C	Appendix J as written is not ready for a "green cover" MOPS. It looks like a working paper was slapped in an Appendix without writing it in MOPS-like language. This appendix needs to be re-written into MOPS-like language and technically corrected in several areas, or deleted.	It is preferred to delete Appendix J. If not do at least the following: ➢ Re-title the appendix, as it is not "Target Scenario for Testing", it is something like "Rationale for 2 second ASSAP latency requirement" ➢ Re-write all of the text to write it in

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					The Figures are not clear that A1 is the TOM, not the TOA from the GPS receiver. The diagrams doe not include data concentrators that are in many real aircraft architectures.	MOPS-like language. ➢ Add Time of Measurement to the Figures, and allow 0.5 seconds as allocated in all GPS receiver MOPS (DO-229D, DO-253B, DO-310, etc.). ➢ Add data concentrators to the figures ➢ Change the last paragraph "According to DO-289, you get 1 second to get state data into the STP function. The STP function (DO-302) and the Link Transmit Function are allocated 1.1 total, with 400 ms allocated to the STP function and 700 ms allocated to the Link Transmit function. ~~actually cuts that 1 second requirement down to 600 ms leaving 400 ms allocated to the STP function. The like transmitter gets 700 ms.~~" **DON WILL DO A NEW APPENDIX ON LATENCY AND THE DEFINITION OF INTERFACES AND WHAT IS INCLUDED**
495.	Volpe Center		Appendix K	C	For all caution and warning symbols, if they are TCAS-based cautions and warnings, the TCAS symbol should be used without any further modification. The warning is the most critical piece of information to which the pilot must respond, and the pilot response must not	For all caution and warning symbols, if they are TCAS-based cautions and warnings, the TCAS symbol should be used without any further modification.

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					be delayed (e.g., the pilot does not need to visually acquire the target to respond to an RA). Adding correlation information, or selection information is confusing and potentially misleading.	
496.	Volpe Center	(all)	Appendix K	E	The colors in the example symbols sets are inconsistent.	The colors used in all examples should be consistent with those shown in AC 120-86 (i.e., use the same shade of blue or cyan, yellow, red).
497.	AIR-130	K	Apdx K	C	The MOPS needs to require a single symbol set. Otherwise, this leads to safety issues associated with nonstandardization, both near-term and in the future. Commonality among symbol sets is more important than individually optimized symbol sets.	Require a single symbol set.
498.	Volpe Center	K-1	Appendix K Introduction	C	The introduction states that the example sets provided do not comply with the requirements in the document body. The inconsistency between the requirements and examples is confusing and misleading. The text in the main body refers manufacturers to the Appendix, giving the impression that these sample symbol sets are approved.	Need to clarify how to use the Example symbol sets. If you do use any of the Example sets, is the system automatically approved? If that is not true, then need to explain why these Examples are here at all. Why are they not in a document separate from the MOPs?
499.	Volpe Center	K-1	Appendix K Introduction	S	Only one symbol set should be presented in addition to the baseline set from AC 120-86A. Including several examples, which variously do and do not meet the	See comment #11.

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					"requirements," is confusing.	
500.	Volpe Center	K-1 through K-4	Appendix K.1.1	S	The design checklist is incomplete.	Some additional topics to include: 1) Consider training needs and the complexity of the overall symbol set. (For example, in Example 3, a symbol distinguishes between data that is suitable for one application but not for another; this level of complexity will increase the training demands.) 2) Colors should be consistent with established conventions and CFRs (possibly insert reference to CFR §§ 23.1322/25.132) 3) Consider the number of different colors used overall and how important the distinctions between colors are. Fine feature distinctions (e.g., in Example 2, the green versus blue, and brown versus other colors, depending on brightness of each) will not be reliably detected, and cannot be used to indicate critical information. 4) Consider the size of the symbol as it will appear to the pilot. Symbols with fine details may need to be shown in a large size in order for the pilot to be able to see all of its features easily. 5) Consider the display resolution needed to display the fine details of the symbols. For example, double borders are fine features that may require high resolution displays and/or large symbol sizes, and/or displays that are

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						close to the pilot's eye. Other "fine features" include the interior "dots" and the "dotted circle" (Example 2).
501.	Honeywell	K-1	K.1	E	1st para – "for example symbol sets" should be "four example symbol sets"	
502.	Honeywell	K-1	K.1	S	3rd para – "It is important to note that these example symbol sets do not necessarily comply with the requirements included in the document body." Are you providing the deviation requests and approvals to use these symbol sets if they do not comply with the requirements? If not, why are they here?	
503.	Terry Abbott	K-1	K.1	E	In "In order to help with the preparation of the requirements, for example symbol sets were developed,…" change the word "for" to "four."	See comment.
504.	Volpe Center	K-2	Appendix K.1.1, item 3	S	Regarding symbology rules are used…	Recommend adding the question "Are the rules applied consistently?"
505.	AIR-130	K-2	K.1.1 2a	S	We no longer use "traffic information quality" in this document.	Change "traffic information quality" to "traffic application capability"
506.	Volpe Center	K-5 to K-6	Appendix K, Table K-1	C	The second column indicates "Requirements", but are they "shall" statements? As currently written, this column is very confusing (See Comment #11 above.)	Either explain the intention of the word "Requirement" and its relation to the "shall" language or use another term.
507.	Volpe	K-5	Appendix	E	The AC120-86 symbol set is different	AC 120-86 should be called out as the baseline

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	Center	to K-6	K, Table K-1		from the Examples, but this is not clear from the table format.	symbol set (as noted in the text above) rather than classified with the example sets.
508.	Honeywell	K-7	K.2	S	The RA for directional traffic does not show directionality. Why would the ASAS MOPS section 2.3.4.2.3.3.a require "If traffic directionality is valid, directionality information **shall** not [] be removed during a TCAS Traffic Advisory or Resolution Advisory."? This seems to go against the published AC.	
509.	Volpe Center	K-8	Appendix K.3	S	In order to be sure that the use of the circle for selection status is okay, tests should be conducted.	Add a note to say that "The circle convention is used on charting displays to indicate a fly-over symbol, and in this symbol set the circle rule indicates a selected target. While this is not likely to be a problematic conflict, tests should be done to validate that assessment."
510.	Volpe Center	K-8	Appendix K.3, Note 2	E	Missing "does" in first line	Correction: For "invalid" traffic, this symbol set does not…"
511.	Volpe Center	K-9	Appendix K.4	S	The ADS-B Caution and Warning symbols lack redundant coding, i.e., color is the only means of discriminating the ADS-B Caution from the ADS-B Warning symbol (for both of the last two rows, directional and no directionality).	Modify the suggested symbols.
512.	Volpe Center	K-9	Appendix K.4	S	This symbol set has many fine features that may be difficult to see (and draw), and could lead to difficulties in symbol interpretation: o Finely dotted circles	Modify the suggested symbols.

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					o Small pointer to represent directionality, o Fine double-borders o Fine distinction between the blue and green o Fine distinction between the white and cyan o Use of brown Because of these fine features, these symbols may need to be drawn in a large size, which may cause other problems with the display. In addition, a fine color distinction (green versus blue) is the only means of discriminating between armed vs. engaged correlated directional traffic. This is easy to miss.	
513.	Volpe Center	K-9	Appendix K.4	S	It is not clear what the rule for distinguishing selected vs. armed targets is. For Correlated Tfc No Directional, Selected and Armed symbols appear to be identical	Modify the suggested symbols.
514.	Sethu Rathinam	K-9	Example Two, App K	S	Column marked ARMED should have a solid outer circle for the either column of symbols (not dotted).	← change per comment
515.	Honeywell	K-9	K.4	S	This symbol set also removes directionality from an RA. Is the requirement not to do so, out of line?	
516.	Volpe	K-10	Appendix	S	It appears that the ground symbols are	Add a note to recommend testing of the use of

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	Center		K.5		intended to be smaller than the airborne target symbols. However the efficacy of this distinction should be validated in tests.	relative size for conveying air/ground status.
517.	Volpe Center	K-10	Appendix K.5	S	This symbol set has the following symbol issues: o Use of brown (a color that is easily confused and hard to see on electronic displays) o Fine double borders in the coupled Caution and Warning symbols o Outlines on the Caution and Warning symbols that may make them appear to be Selected.	Test the symbols to ensure that these fine features can be distinguished easily and are not confused.
518.	Volpe Center	K-10	Appendix K.5	E	This symbol set is presented in a different format from the others.	The format of this example should match the others. Show the symbols in a table rather than having symbols in individual sections.
519.	Volpe Center	K-11 and K-12	K.6	S	Overall, this symbol set is the most complex and presents the most training issues. For example: o Need to explain why “invalid” traffic symbols need to be shown the pilot. o FYI, in a Volpe Center test, the use of the “X” in the symbol was associated by most pilots with “ground” target, not with data quality. o Use of rectangle was not associated with Ground by untrained pilots in Volpe research; pilots may need to be taught this	Modify the symbols.

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					association o Rectangles and squares may be difficult to discriminate in isolation. o The data tags indicating the type of ground vehicle may be difficult to read and may also present a training issue. The data tag may also be confused with taxiway labels and contribute to clutter if other data must be shown. o The magenta outline for the selected degraded airborne traffic (K.6.2.5) appears to reduce the saliency of the red (warning).	
520.	Honeywell	K-11	K.6.1.7	S	This symbol set has a diamond with higher priority than a circle. This violates the 20 years of fielded TCAS implementation. Seems like it would be very confusing to pilots and should not be recommended here.	
521.	Volpe Center	K-11	K.6.1.7	E	The section mentions that a low level art includes “proximity”. This word can be confused with “proximate” target, which is not a threat in TCAS.	Explain what is a “low level” alert, and try not to use the word “proximity.”
522.	Volpe Center	K-12	K.6.2.2	S	“Degraded Airborne Traffic With Warning Level Alert and Directionality” shows symbol for Caution-level Alert (yellow), whereas a red symbol should be used for Warnings.	Change the Warning symbol to red.
523.	Volpe	K-14	Figure K-1	S	Figure K.1 is inconsistent with	Update the Figure.

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	Center				requirements set forth earlier in the document because the altitude information is not placed above the symbol as required in Section 2.3.5.5.1 a. (Traffic Relative Altitude. Other required info is missing, but the info presented in an example should be consistent with requirements.	
524.	Volpe Center	K-14	Figure K-1	S	The layout of controls provided in K.1 seems best suited for line-select keys rather than a touch-screen display. The layout actually violates several design principles for using a touch screen display (e.g., making functions obvious, spacing of controls to prevent inadvertent activation)	Rethink what is intended to be conveyed by the figure.
525.	Volpe Center	K-16	K.6.3.4	E	The sentence, "Controls which must feedback settings include a green status of the current setting" is difficult to parse/understand.	Reword.
526.	Volpe Center	K-16	Figure K-4	E	The description of Figure K-4 is confusing, and may not comply with other requirements (e.g., use of color). The description says that "A white Off next to a white application indicates that a coupled application is available to run, but nothing is coupled" whereas a green Off indicates that it is indeed off. Does this mean that a white Off means On? Green usually means Go so its use for Off may	Rewrite description of Figure K-4

No.	Reviewer Name	PAGE	SECTION	*C S E	COMMENT / RATIONALE	PROPOSED RESOLUTION
					contribute to misinterpretation errors. (Off should not be in green; a white off doesn't really mean that it's off.)	
527.	Burns	n/a	Appendix L	C	The Data Lifetime Table L-1 referred to in test sections 2.5.2.1.1, 2.5.2.1.2, 2.5.2.3.1 and 2.5.2.3.2 needs to be added to the document.	Add an Appendix L to the document with the Table L-1 (below) included.