

## Public Comment Log

TSO-165a

#	Commenter	Page & Para. No.	Comment	Reason for Comment	Suggested Change	Comment Resolution
1.	Cédric Lacoste, Bombardier	Appendix page 1-3	2.3.1 Note 3, refers to 2.2.5(6), but the previous note on 2.2.5 changes this reference to 2.2.5(7). This can cause confusion in interpretation	Inconsistent referencing.	Change reference to “2.2.5(7) as amended previously on page X of TSO” or something similar for clarity.	<b>Accepted.</b> Comment incorporated into rewritten appendix.
2.	Jeffrey Williams (Astronautics Corp.of America, a.k.a. Astronautics)	Page 3, paragraph 4.b. (1)	In paragraph 4. “Marking”, under b it says, Also, mark the following permanently and legibly....: (1) Each component is easily removable (without hand tools)....”  The first part is OK, but trying to link the meaning of (1) is rather difficult to follow. It seems to be a simple statement that all components are easily removable, which may not be the case.	Without clarification, this is hard to understand and seems to be a irrelevant statement.	If I understand the intent correctly, I suggest either changing it to say, “ <b>Each easily removable component</b> ....” or changing it by adding the word “that”, to say you must also mark “Each component <b>that</b> is easily removable...”	<b>Accepted.</b>
3.	Terrance McCraw (Astronautics)	Appendix 1, page 1-2, 2.2.5 and others	The phrase “the current version of RTCA/DO-272 or EUROCAE/ED-99” is included in several places, and is unclear. This statement could be interpreted as a mandate that the current version must be used, which appears contrary to the stated intent in page 1-1 item 3.	Clarity	The phrasing should be modified to more clearly state the intent, e.g. “RTCA/DO-272C or EUROCAE/ED-99C, or any later version”, if that is the intent.	<b>Accepted.</b> Comment incorporated into rewritten appendix.
4.	Terrance	Appendix	Item numbers 8 and 9 are cited as	Consistency	Change 2.3.1.1.1	<b>Accepted.</b>

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	McCraw (Astronautics)	1, page 1-4, 2.3.1.1.1	replacing items 5 and 6		item 8 and 9 to 5 and 6	Comment incorporated into rewritten appendix.
5.	Terrance McCraw (Astronautics)	Appendix 1, page 1-4, 2.3.1.1.2	Item number 4's indentation is inconsistent with preceding items	Aesthetics	Adjust the indentation of item number 4 to match number 3	<b>Accepted.</b> Comment incorporated into rewritten appendix.
6.	Terrance McCraw (Astronautics)	Appendix 1, page 1-11, 2.6.3.2.4	Item number 7 is phrased as a direct implementation requirement, when it resides in a section concerning test bench procedures. The current wording is inconsistent with the preceding items in DO-272.	Consistency	Suggested re-wording: "If a process is frozen for more than five seconds, this condition shall be detected by a process activity monitor (watchdog) and either the outdated/frozen information removed from the display, or a clear indication of the invalid data provided to the flight crew (e.g., by providing a red cross). [2.2.4]"	<b>Partially Accepted.</b> Removed editorial inconsistency "(e.g., by providing a red cross)" from test requirement versus performance requirement. Watchdog must be able to detect any frozen processes within 5 seconds, not just those frozen for 5 seconds or longer.
7.	Terrance McCraw (Astronautics)	Appendix 1, page 1-11,	Item number 7 seems unnecessarily restrictive for EMDs with "minor" failure	Restrictive requirement	Modify item number 7 to apply only to EMDs with	<b>Not Accepted.</b> This requirement is added for

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	Corp.of America)	2.6.3.2.4	<p>condition classifications, e.g. AMMDs. AMMD ground-only applications may receive an "incomplete system" TSOA on a Class 2 EFB using the guidance in AC 20-159. AC 20-159 states that:</p> <p>"You must establish detection and fault handling means to protect AMMD software from malfunction that could be caused by any Type A and B applications and the commercial-off-the-shelf (COTS) computing platform including the operating system. "</p> <p>Thorough verification is likely to discover cases where the COTS host system could prevent the AMMD from detecting or resolving such failure, despite the best effort of the AMMD software to implement checks. The safety impact of this failure would be minor.</p>		major failure classifications, e.g. "For systems with major failure condition classifications verify the following: ..." preceding item 7.	harmonization with EASA operational requirements as well as ETSO-C165a.AC 20-159 comparison is for the non-interference requirements for Type A/B applications, AC 20-159 will likely be cancelled once AC 120-76B Change 1 is issued.
8.	UASC	Pg 2, 3b.	Hazard classifications are inappropriate.	The applicant should define intended function of the display itself. There are airborne	Remove hazard classifications from TSO and allow applicant to define intended function	<b>Not Accepted.</b> These hazard levels have not been changed from the original TSO or

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				applications which may not rise to the level of major, and there are ground applications which could rise above the level of minor. The hazard analysis should make the appropriate determination of DAL, not via arbitrary requirement.	and hazard classifications associated with those defined intended functions.	MOPS
9.	UASC	Pg 1-4, 8	Runway own-ship sensor accuracy inappropriate.	The TSO defines ground operations for own-ship to be minor, yet the TSO requires GPS horizontal accuracy to be less than 36 meters. LPV approach capability only requires a HAL of 50 meters.	This requirement should be removed and appropriate accuracy requirements based upon intended function and hazard classification.	<b>Not Accepted.</b> This revision does not change the own-ship sensor accuracy requirement, but does allow a reallocation of the error budget if the total system accuracy is less than or equal to 50 meters.
10.	Thales-Avionics	Page 1 Para. 2.a.	The six months' time limit before the new change became effective is too short.	As per 14 CFR PART 21 Subpart O, § 21.603 article shall met the TSO requirements at the date of the	Allow the application of previous revision up to 18 months.	<b>Accepted.</b> The FAA is moving all new TSO towards an 18 month grace period.

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				<p>application.</p> <p>However, current development for TSO C165 compliance may not be finished before the 6 months grace period.</p> <p>Moreover, modifications between C165 and C165a are substantial enough to necessitate more than 6 months of effort to reach compliance to TSO C165a.</p>		
11.	Thales-Avionics	Page 12 Appendix 1 Para 2.3.1.2 Sub-section 7.	<p><b>Depiction of Own-ship Position</b></p> <p>The proposed acceptable means of compliance is applicable for systems for which very stringent own-ship positioning display accuracy is required which may not be the case of all the equipment applying for this TSO.</p>	The TSO address different type of AMMD: from Airport Navigation Function to simple display of an own-ship A/C symbol on a converted/digitalized paper Terminal Charts.	<p>Addition of another acceptable means of compliance:</p> <p>“An acceptable means would be a limitation on the GNSS sensor antenna installation position in relation</p>	<b>Accepted.</b> Comment incorporated into rewritten appendix.

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					to the pilot's position of 2 meters or the use of an own-ship position symbol whose size would cover at least the size of the actual aircraft with regard to the scale of the map depicted on the display."	
12.	Thales-Avionics	Appendix 1 Page 12 Para 2.3.1.2 Sub-section 8.	<b>Depiction of Own-ship Position</b> mention a specific ground speed limit to remove the own-ship symbol seems very limitative	Depending on actual aircraft performance, keeping the own-ship symbol for ground speed values greater than 80 knots may not contradict the purpose and the usage of this feature by the crew.	Modification of section 8:  "AMMD applications limited to the airport surface (ground applications) and having only a minor failure condition classification shall remove the own-ship position symbol at a ground speed limit whose value should be set taking into account aircraft performance or installation dependent horizontal position	<b>Not Accepted.</b> This value is consistent with the value specified in DO-317A for surface CDTI limits. This is greater than the 40 knots specified in AC 20-159 as an appropriate speed to remove own-ship and assumes anyone taxiing at 80 knots is probably rotating for take-off at that point.

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					latency	
13.	Thales-Avionics	Page 4 Para. 5. a. (3)(a)	In the requirement: “The positioning source for the EMD system must be from a TSO-approved Global Navigation Satellite System (GNSS) sensor “, understanding is that the position, coming from a TSO-approved GNSS sensor could also be hybridized.	Could be worth adding a precision on this point.	Add a precision indicating that position may be hybridized.	<b>Acknowledged.</b> A hybrid system utilizing GNSS position as one of the inputs will meet this requirement.
14.	Airbus	3.d & 3.f	Sections 3.d on environmental qualification and 3.f on electronic hardware qualification are applicable. TSO seems to deal with “article” as equipment composed of hardware and software. In addition §3.a. define that TSO’s standards apply to “equipment”.  Is it possible to apply for a TSO authorization for a software-only part?  Actually, we can expect some practical cases where a supplier has developed a hardware platform that can host independent stand-alone software from another supplier.	This TSO-C165a in section 3.d and 3.f. details how shall be qualified the hardware platform.  As per specific AC 20-173 (EFB) §5.e.(1) and AC 20-159 (AMMD) §4.c, the opportunity to split software application (AMMD/database) and host platform (EFB) exists, but lead to an incomplete TSOA.  In a context of new technologies	A proposal could be to consider software-only application at TSO level, and define hardware /environmental considerations only if the hardware is part of the EMD.  The question is mainly to clarify how to deal with software-only parts.	<b>Not Accepted.</b> AC 20-159 will still allow use of incomplete TSO-C165 in EFBs as long as it is effective. Intent of AC 20-159 was never to allow software-only TSO on approved compliant hardware. With publication of AC 120-76B Change 1 the FAA will allow own-ship applications for the airport surface to be authorized as an EFB Type B application, which will likely lead to cancellation

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			EASA through the NPA 2012-02 proposed to open the ETSO-C165 to software only parts.	enabling several software applications to share the same hardware host platform, does software-only article can be recognized at TSO level?		of AC 20-159.
15.	Airbus	Appendix 1 §2.2.5.2.6.	<p>“Corruption of the EMD database shall be detected and annunciated to the flight crew clearly and in a timely manner”.</p> <p>Does the removal of the electronic map behind the aircraft position can be considered as mean for the flight crew to detect a failure on the map display?</p>	A design solution can be to remove the electronic map behind the aircraft position in case of data are corrupted or not consolidated.	Please clarify the intent of this section.	<b>Acknowledged:</b> Removal of the map would be considered an acceptable means. A better means would be to remove own-ship indication and provide an indication of the database corruption.
16.	Airbus	Appendix 1 §2.3.1.2.7	<p>“The AMMD shall provide a means to compensate for installation dependent antenna position bias error”.</p> <p>Can we consider the following means as acceptable? Aircraft position received from sensors is corrected in order to define a reference point on the aircraft (intersection of the wings and body). This reference position is used for the positioning of the</p>	Other design solutions are expected, different than the solution proposed in §2.3.1.2.7.	Please clarify the intent of this section.	<b>Not Accepted.</b> The reference location was harmonized with RTCA DO-260B and RTCA DO-282B.

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			aircraft symbol displayed on the electronic map.			
17.	Airbus	Appendix 1 §2.3.1.2.8	<p>“AMMD applications limited to the airport surface (ground applications) and having only a minor failure condition classification shall remove the own-ship position symbol at a ground speed above 80 knots”</p> <p>When the AMMD covers both on-ground and in-flight applications (approach/landing phase), can we consider that keeping the continuity of the own-ship display even when the aircraft is on-ground above 80 knots fits to the requirement?</p>	AMMD can be shared between on-ground and in-flight applications. In this case, does the requirement apply to the on-ground application when the own-ship is in the on-ground phase? Or the proposed interpretation to keep the own-ship displayed above 80 knots is acceptable.	Please clarify the rational of this requirement.	<b>Accepted.</b> AMMD function does not include “approach/landing phase” or “ground speed above 80 knots” so if the EMD includes these in-flight functions, then the application can continue to display own-ship as appropriate.
18.	Airbus	§3.a	<p>“This TSO’s standards apply to equipment intended to provide graphical depiction of advisory information on EMD (e.g. navigation, traffic, weather, obstacles, graphical taxi routing)”.</p> <p>Advisory information to display can be computed independently from the display equipment.</p> <p>Beyond the Airport moving map,</p>	<p>Integrated cockpits are based on multifunction/shared displays which are displaying information received from other systems.</p> <p>Does TSO-C165a apply to equipment that are in charge of building a picture with items relatively</p>	Please clarify the applicability of the TSO.	<b>Acknowledged.</b> We assume this function would underlay other functions. For example, TSO-C195a for Avionics Supporting Automatic Dependent Surveillance – Broadcast (ADS-B) Aircraft

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			does the traffic, weather, flight plan or obstacles information displayed on a screen relatively to an aircraft (own-ship) position is considered as an electronic map display?	to the aircraft (own-ship) position?		Surveillance Applications (ASA) requires compliance to TSO-C165 as a pre-requisite. Other functions which include maps should do the same.
19.	Cessna Aircraft Company	Appendix 1	The number of deviations from the RTCA DO-257A MOPS seems large given the concept behind consensus standards. Our understanding is that FAA has representation on the RTCA Special Committee, thus we would like to understand the reason for the deviations. In addition, we would appreciate information on plans to reduce or eliminate deviations between the consensus standards and TSOs in the future.			<b>Acknowledged.</b> This MOPS update was based on the proposed ETSO-2C165 which was written by a government/industry group which included US participation. There are also a number of included items to address recurrent deviation request. There are proposals from industry to take up this work in RTCA SC-217, but they have not yet made it to PMC and would be a number of years away.
20.	Garmin	General	As noted in the TSO-C165a	Substantive changes	Withdraw FAA	<b>Accepted.</b>

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			<p>Appendix 1 introduction, one of the purposes of updating TSO-C165a is to “adopt agreed harmonization with ... (EASA) ... ETSO-C165a.” However, ETSO-C165a is not published so there is no opportunity to review FAA’s draft TSO-C165a against ETSO-C165a. Additionally, it should be noted that FAA’s draft TSO-C165a is not consistent with EASA’s draft ETSO-C165a which was made available for comment with EASA NPA 2012-02.</p> <p>Furthermore, as noted in Garmin’s comments on specific paragraphs below, there are many aspects of draft FAA TSO-C165a that are problematic. Similarly, Garmin noted many aspects of draft EASA ETSO-C165a as being problematic.</p> <p>RTCA/DO-257A, which is the basis for both FAA TSO-C165 and EASA ETSO-C165, was arrived at using the proven government/ industry consensus process. It is unfortunate that</p>	<p>to the RTCA/DO-257A requirements, such as those being proposed by both FAA draft TSO-C165a and EASA draft ETSO-C165a, should be accomplished through the government/industry consensus process which will ensure rigorous debate and review.</p>	<p>draft TSO-C165a and make updates to DO-257A via a RTCA Special Committee with joint EUROCAE participation to ensure harmonization of requirements.</p>	<p>This MOPS update was based on the proposed ETSO-2C165 which was written by a government/industry group which included US participation. There are also a number of included items to address recurrent deviation request. There are proposals from industry to take up this work in RTCA SC-217, but they have not yet made it to PMC and would be a number of years away.</p>

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			<p>both EASA and FAA have chosen to forego that consensus process and define problematic requirements without the advantage of the rigor associated with the consensus process.</p> <p>Furthermore, many of the issues that are noted in Garmin's comments were already debated during the course of the TSO-C195a (RTCA/DO-317A) SURF application. Since TSO-C195a paragraph 3.a.(4) indicates compliance with TSO-C165 is a prerequisite for claiming TSO-C195a for SURF applications, it is unclear why the FAA believes that requirements beyond those specified by TSO-C195a and DO-317A are necessary in TSO-C165a.</p>			
21.	Garmin	General	Draft TSO-C165a Appendix 1 includes numerous references to EUROCAE documents but the application of those references is inconsistent. For example, the references are only to EUROCAE/ED-99 (equivalent to RTCA/DO-272) and EUROCAE/ED-76 (equivalent to	Since the documents are equivalent, there is no need to reference both and further clutter the text.	Suggest removing the EUROCAE references and retaining only RTCA references.	<b>Not Accepted.</b> The new MPS in this revision are consistent with the format found in DO-257A. The intent of this proposal is to use DO-257A with the modifications

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			RTCA/DO-200A) but there is no similar reference to EUROCAE/ED-14G (equivalent to RTCA/DO-160G).			specified in the appendix.
22.	Garmin	2, 3.b.(3)	<p>Includes the statement:</p> <p style="padding-left: 40px;">“Design the system to at least the design assurance level commensurate with the failure condition classifications.”</p> <p>Wording needs to change to recognize the fact that failure condition classification is ultimately determined by aircraft level analysis.</p>	<p>It is reasonable to clarify the wording to ensure aircraft level analysis is the driver for determining failure classifications. EASA has recognized this using the following wording in ED Decision 2010/010/R 14/12/2010 Annex I Subpart A – General 2.4 Failure condition classification: “Develop the system to, at least, the design assurance level equal to the failure condition classifications provided in the ETSO. Development to a lower Design Assurance Level</p>	Re-work this section to match the EASA wording. Or work with industry to develop an agreed to wording.	<b>Not Accepted.</b> MOPS hazard levels have not changed from original TSO, and we even picked “no-effect” for loss of AMMD vice minor per DO-257A.

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				may be justified for certain cases and accepted during the ETSO process but will lead to installation restrictions.”		
23.	Garmin	3, 4.b.(1)	This section states:  “(1) Each component is easily removable...”  The word “that” should be added after the word “component”.	Editorial.	Add the missing word “that”.	<b>Accepted.</b> Now says “...each easily removable component...”.
24.	Garmin	4, 4.b.(2)	Paragraph 4.b.(2) states:  “Each subassembly of the article that you determined may be interchangeable.”  This language is confusing.	The language for this requirement is confusing. This could mean that a stuffed printed circuit board needs the TSO number.	Suggest removing the statement or if removing causes problems, work with industry to establish wording that is better understood.	<b>Not Accepted.</b> This language is in accordance with the standardized TSO template in Order 8150.1C.
25.	Garmin	4, 5.a.(3)(a), 3 <sup>rd</sup> bullet	This section states:  “Aeronautical databases for the EMD system must be loaded on components or equipment of controlled and approved design.”  This statement does not account	The referenced statement conflicts with the 43.3(k) assessment of database transfer mechanisms and responsibility for database updates.	Remove the 5.a.(3)(a) 3 <sup>rd</sup> bullet.  For consistency with 43.3(k)(3), add a statement under 5.a.(1) requiring the	<b>Accepted.</b>

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			<p>for modern TSO designs that use common removable media devices like SD cards or wireless technology to update aeronautical databases. E.g., final rule 43.3(k) (Amdt. 43-45) includes the following in section III. Discussion of the Final Rule (Federal Register, Vol. 77, No. 230, p. 71093):</p> <p>“Instead, we see the pervasive use of permanently installed data-transfer mechanisms. These mechanisms can include a slot for an SD card, an installed dataloader, or even wireless technology.”</p> <p>And:</p> <p>“Protection of the data would not require special skills or action because data is stored on media similar to an SD card or flash drive.”</p> <p>SD cards are often retained in the installation due to the size of the aeronautical database (e.g., terrain and electronic geo-</p>		<p>inclusion of instructions to the pilot that describe how to perform the database update and determine the status of the data upload.</p>	

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			<p>referenced charts/airport diagrams) rather than storing the database in internal memory. As written, the draft 5.a.(3)(a), 3<sup>rd</sup> bullet statement will make it impractical to use existing approved designs with this TSO.</p> <p>Furthermore, requiring a “controlled and approved design” for an SD card is inconsistent with the 43.3(k) final rule discussion that determined that no special protection of the data stored on the device is required. This is because both the TSO article that uses the database and the database format itself must be of a “controlled and approved design”. This allows the TSO article to assess the database’s suitability for use through means such as:</p> <ul style="list-style-type: none"> <li>• Determining whether the data format is consistent with expectations as required by draft TSO-C165a Appendix 1 2.2.5 sub-section 4 via the use of DO-200A, which requires DQR definition including</li> </ul>			

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			<p>format, and</p> <ul style="list-style-type: none"> <li>• Detecting database corruption as required by draft TSO-C165a Appendix 1 2.2.5 subsection 6.</li> </ul> <p>Consequently, the means of providing the data (which today can consist of floppy disks, cable connection from database loader to TSO article, SD card, mini SD card, flash drive, PCMCIA card, wireless, etc.) to the TSO article does not need to be controlled; rather the protection of properly formatted data is what requires control, as is currently required via the TSO article MPS.</p> <p>Lastly, this statement is located in the context of “Installation procedures and limitations”. While an installer may perform the initial database installation, as acknowledged by 43.3(k), the operator has primary responsibility for updating databases. Consequently, it would be more appropriate to include an item under 5.a.(1) requiring the inclusion of</p>			

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			instructions to the operator describing the database update process.			
26.	Garmin	4, 5.a.(3)(a), 5 <sup>th</sup> bullet	<p>This bullet states:</p> <p style="padding-left: 40px;">“Specification of the Data Quality Requirements (DQRs) for the EMD system must be incorporated as part of the compliance documentation.”</p> <p>This statement is in the context of defining “Installation procedures and limitations”. It is unclear what purpose is served to the installer by including RTCA/DO-200A 2.3.2 DQRs for accuracy, resolution, assurance level, traceability, timeliness, completeness, and format in the installation manual.</p> <p>Determination of the adequacy of the EMD DQRs to meet the TSO-C165 EMD display requirements must be made by the TSO article manufacturer and these must be documented by the TSO article manufacturer to ensure DO-200A compliance in accordance with other TSO requirements. The</p>	<p>It is impractical to include the DQR specifications in the “installation procedures”. Furthermore, there is no requirement in either AC 20-153A or DO-200A to provide such information to an installer so this is a change in requirements that has not been agreed to through the government/industry consensus process. Lastly, AC 20-153A defines a method to obtain a Type 2 LOA for the aeronautical databases used by EMDs. It should be sufficient to point the installer to evidence of a Type 2</p>	<p>Remove this bullet or at least replace it with one that can be practically met by the TSO article manufacturer (e.g., provide the installer with evidence of a Type 2 LOA for the aeronautical databases).</p> <p>This comment also applies to similarly problematic guidance in draft AC 20-138D and similar changes should be made in AC 20-138D before it is published in final form.</p>	<p><b>Accepted.</b> Comment incorporated into the updated Paragraph 5.a.</p>

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			DQR documentation typically is hundreds of pages in length and includes information that is proprietary to the TSO article manufacturer.	LOA rather than repeating hundreds of pages of documentation.		
27.	Garmin	5, 5.f	<p>This section states:</p> <p style="padding-left: 40px;">“Identify functionality or performance contained in the article not evaluated under paragraph 3 of this TSO (i.e., non-TSO functions).”</p> <p>Articles that perform functions for a particular TSO (e.g., TSO-C165a) may also meet other TSOs for GPS/SBAS, display of moving map, traffic, weather radar, data link weather, communication radios, etc. This section implies that functions that are not covered by paragraph 3 of TSO-C165a are non-TSO functions.</p>	The referenced text implies that functions that are not covered by paragraph 3 of TSO-C165a need to be identified even if they are functions of other TSOs.	<p>Revise text to clarify intent for functions covered under other TSOs. Suggested text:</p> <p style="padding-left: 40px;">“Identify functionality or performance contained in the article not evaluated under another TSO or under paragraph 3 of this TSO (i.e., non-TSO functions).”</p>	<b>Not Accepted.</b> This language is in accordance with the standardized TSO template in Order 8150.1C.
28.	Garmin	5, 5.f.(1)	This paragraph requires listing the “failure condition classification” in the installation manual which can be misleading to the installer and is inconsistent with the process of determining failure condition classification at	Failure condition classification is determined by system safety assessment at the aircraft level and can vary based on	Remove the requirement to list “failure condition classification” in the Manual(s).	<b>Not Accepted.</b> This language is in accordance with the standardized TSO template in Order 8150.1C.

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			the aircraft level.	<p>installation. By providing a failure condition classification at the appliance level this creates an impression that the safety analysis for these functions is complete.</p> <p>Additionally, TSO paragraphs 5.a.(4)(a) and 5.a.(4)(b) already require the Manual(s) to contain the software and AEH design assurance levels that an installer needs to determine whether the equipment can support the aircraft level failure condition classification.</p>		
29.	Garmin	5, 5.f.	TSO paragraph 5.f and its subparagraphs define required information to be supplied to the ACO for a non-TSO function. This guidance is inconsistent with	TSO paragraph 5.f indicates that “you must ... include the following information with	Adjust the wording in the TSO (template) to be consistent with the 8110.4C CHG 4	<b>Not Accepted.</b> This language is in accordance with the standardized TSO template in Order

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			Order 8110.4C CHG 4.	your TSO application” but the TSO 5.f subparagraphs which specify the required information to be supplied to the ACO for a non-TSO function are inconsistent with the Order 8110.4C CHG 4 paragraph 6-9.b.(3) “Manufacturer Data Submittal” requirements. For example, TSO paragraphs 5.f.(5) and 5.f.(6) require submittal of “Results of test/analysis” while Order 8110.4C CHG 4 paragraph 6-9.b.(3) requires submittal of “proposed test procedures”; while both sets of guidance use the word “test”, otherwise there is no similarity.	intent.	8150.1C.
<b>30.</b>	Garmin	5,	TSO paragraph 5.f and its	TSO paragraph 5.f	Adjust the wording	<b>Not Accepted.</b>

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		5.f	subparagraphs include definition of non-TSO functions and the data to be submitted to the ACO for non-TSO functions. This guidance is inconsistent with Order 8110.4C CHG 4.	states “Identify functionality or performance contained in the article not evaluated under paragraph 3 of this TSO (that is, non-TSO functions).” Use of the term “performance” in the definition of a non-TSO function is inconsistent with the Order 8110.4C CHG 4 paragraph 6-9.b.(1) and 6-9.b.(3)(a) guidance regarding how to define a non-TSO function. The issue is non-TSO should not be defined as “performance”. It will create difficulty if these criteria are used. For example, if a TSO requires a minimum 10 watt transmitter and a company makes	in the TSO (template) to be consistent with the 8110.4C CHG 4 intent.	This language is in accordance with the standardized TSO template in Order 8150.1C.

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				<p>equipment that is robust at 11 watts, the performance exceeding the TSO is not called out under the TSO; consequently, by the paragraph 5.f “performance” definition, the 11 watt transmitter has a non-TSO 1 watt capability. The distinction of a “function that can be accomplished outside the TSO box” as is specified in Order 8110.4C CHG 4 paragraph 6-9 is critical to making non-TSO function work long term.</p>		
31.	Garmin	7, 7.b.	TSO paragraph 7.b contains wording that is inconsistent with Order 8110.4C CHG 4.	TSO paragraph 7.b includes additional guidance about what furnished data should be provided to an operator or repair station when	Adjust the wording in the TSO (template) to be consistent with the 8110.4C CHG 4 intent.	<b>Not Accepted.</b> This language is in accordance with the standardized TSO template in Order 8150.1C.

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				the equipment includes a non-TSO function. The problematic guidance states “include one copy of the data in paragraphs 5.f.(1) through 5.f.(4).” This guidance is inconsistent with Order 8110.4C CHG 4. Order 8110.4C CHG 4 paragraph 6-9.b.(6) defines the FAA-industry agreed data that must be provided to an installer when equipment includes a non-TSO function.		
32.	Garmin	1-2, 2.2.5, sub-section 2, Note 3	Includes the statement:  <i>“Complex start-up messages with long lists of what is out of date are not acceptable.”</i>  While this text is also included in RTCA/DO-257A, it is unclear what this text means.	The referenced statement is ambiguous and could use clarification.	Either clarify the referenced statement or remove it.	<b>Accepted.</b> Comment incorporated into rewritten appendix.
33.	Garmin	1-3,	Specifies a new requirement for:	At the very least the	Remove 2.2.5 sub-	<b>Accepted.</b>

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		2.2.5, sub-section 3	<p>“The aeronautical information used in the development of AMMDs shall meet the standards specified in the current version of RTCA/DO-272 or EUROCAE/ED-99 and meet the requirements for medium quality.”</p> <p>While Garmin agrees with the removal of the existing DO-257A 2.2.5 sub-section 4 statement that the database “should” meet the standards specified in RTCA/DO-201A for navigation data and RTCA/DO-276 for terrain/obstacle data, the new “shall” requirement to meet the RTCA/DO-272 aerodrome mapping information standard brings with it the following issues:</p> <ol style="list-style-type: none"> <li>1. While the 2.2.5 sub-section 3 requirement uses the term AMMD, its context is within the general requirements that are applicable to EMDs used in flight; consequently, it is in an inappropriate location since</li> </ol>	<p>2.2.5 sub-section 3 requirement is in an inappropriate location. However, as noted in Garmin’s comments on both 2.2.5 sub-section 3 and 2.3.1.1.1 sub-section 9 [sic], it is also inappropriate to require the use of DO-272 as a minimum requirement for AMMDs due to several other factors.</p>	section 3.	Comment incorporated into rewritten appendix.

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			<p>AMMD information is not typically displayed in flight but instead is primarily displayed on the surface. A more appropriate location would be DO-257A 2.3.5 which defines specific AMMD database requirements.</p> <p>2. The requirement reference is to “DO-272” but does not specify which DO-272 revision(s) is (are) acceptable; DO-272C is the current revision. It is unclear whether all DO-272 revisions would be considered acceptable or whether DO-272C would be required.</p> <p>3. When DO-257A was originally developed, it was understood that many AMMDs would use runway information included in the ARINC 424 navigation data to display runways when claiming compliance with TSO-C165. However, DO-272 does not apply to navigation “aeronautical databases” based on ARINC 424.</p>			

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			<p>4. Similarly, AMMDs also utilize electronic geo-referenced airport diagrams (e.g., Jeppesen’s JeppView). However, DO-272 does not apply to electronic geo-referenced airport diagram “aeronautical databases”.</p> <p>5. As written, this statement requires “blanket” compliance with RTCA/DO-272 since there are no references to specific sections or specific attributes (such as accuracy, which is mentioned in draft TSO-C165a Appendix 1 2.3.1.1.1 sub-section 9 [sic]). Consequently, this could lead to additional compliance issues such as:</p> <p>a. The expectation that compliance with RTCA/DO-291 is also required since DO-272C section 3 begins with the statement “In addition to the following requirements, those described in DO-200A/ED-76 and DO-291B/ED-119B are applicable.” This DO-272C</p>			

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			<p>section 3 statement brings with it the additional expectation that “blanket” compliance with DO-291B also would be applicable to AMMD databases.</p> <p>b. The expectation that the ARINC 424 navigation data, such as runway length and width, used by an AMMD must comply with requirements like DO-272C 3.1.5, which states: “The metric system shall be used for all linear measurements (e.g. runway length).” ARINC 424 runway length and width data is provided in feet. It does not make sense to lose resolution by converting these data to metric units just to comply with DO-272C since the net result would be a less accurate depiction of the airport environment.</p> <p>c. The expectation that neither ARINC 424 nor manufacturer proprietary formats are acceptable AMMD database formats</p>			

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			<p>since DO-272C 3.8.2 states: “DO-291B/ED-119B shall be applied with respect to the interchange of AMDBs.” Garmin’s proven, safety-enhancing SafeTaxi database supporting AMMDs is not based on the DO-291B AMDB interchange specification. The SafeTaxi database has been certified for use in tens of thousands of aircraft across Parts 23, 25, 27 and 29. It is unclear what safety benefit will be provided to our customers by being required to:</p> <ul style="list-style-type: none"> <li>i. Document how the SafeTaxi format is equivalent to the DO-291B AMDB format or,</li> <li>ii. Having to change the SafeTaxi format, and the DO-178B-based embedded software that uses it, just to comply with the DO-291B AMDB requirements, or</li> <li>iii. Having to obtain a TSO deviation and show an</li> </ul>			

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			<p>ELOS to DO-272C and/or DO-291B, or</p> <p>iv. Seek an AMDB from a DO-272C-compliant supplier, with the subsequent effect of embedded software changes, reduction in the number of available airports (typically only those served by airlines), and increased cost to the operator because the supplier has higher prices than those for SafeTaxi.</p> <p>6. Blanket compliance with DO-272 is more burdensome than the AMMD database requirements for the TSO-C195a SURF application because:</p> <p>a. TSO-C195a references RTCA/DO-317A as its Minimum Performance Specification. DO-317A has no requirement for compliance with DO-272; the only DO-317A references to DO-272 are in Notes in sections 1.5.2.6,</p>			

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			<p>2.3.8.1, and 3.1.9.</p> <p>b. TSO-C195a paragraph 3.a.(4) includes the only requirement related to DO-272 in the statement “Databases used to support moving maps integrated with the SURF application must meet DO-200A Data Process Assurance Level 2 for state-provided data with Essential Integrity as defined in DO-272B.” But the TSO-C195a paragraph 3.a.(4) requirement really must be met in accordance with the DO-200A process, which is already covered by the new draft TSO-C165a 2.2.5 sub-section 4 and 2.3.5 sub-section 2 requirements. Consequently, there is no need for a similar requirement in TSO-C165a.</p>			
34.	Garmin	1-3, 2.2.5, sub-section 4	<p>Revises the original DO-257A 2.2.5 sub-section 4 requirement to:</p> <p>“The processes producing and updating aeronautical</p>	<p>Editorial. Ensure database integrity commensurate with the failure classifications.</p>	<p>Revise 2.2.5 sub-section 4 to state:</p> <p>“The processes for producing and updating</p>	<p><b>Accepted.</b> Comment incorporated into rewritten appendix.</p>

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			<p>databases shall meet the standards specified in RTCA/DO-200A or EUROCAE/ED-76.”</p> <p>The word “for” should be added after the word “processes”. Additionally, to alleviate the potential FAA concern with removing DO-272 references to “medium quality” with respect to database integrity, this requirement should be revised to ensure DO-200A process database integrity is commensurate with the failure classifications.</p>		<p>aeronautical databases shall meet the standards specified in RTCA/DO-200A or EUROCAE/ED-76 for Data Process Assurance Level 2.”</p>	
35.	Garmin	1-3, 2.2.5, sub-section 5	<p>The new requirement for:</p> <p>“Specification of the Data Quality Requirements (DQRs) for the EMD system shall be developed and incorporated as part of the compliance documentation.”</p> <p>is unnecessary because the new 2.2.5 sub-section 4 already requires:</p> <p>“The processes producing and</p>	<p>The new 2.2.5 sub-section 5 requirement is unnecessary because it is redundant with the 2.2.5 sub-section 4 requirement.</p>	<p>Remove 2.2.5 sub-section 5 or at least change it to a Note under 2.2.5 sub-section 4 as follows:</p> <p>“Note: RTCA/DO-200A 2.3.2 requires the specification of the Data Quality Requirements</p>	<p><b>Accepted.</b> Comment incorporated into rewritten appendix.</p>

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			<p>updating aeronautical databases shall meet the standards specified in RTCA/DO-200A or EUROCAE/ED-76.”</p> <p>Compliance with RTCA/DO-200A requires that DQRs (including accuracy, resolution, assurance level, traceability, timeliness, completeness, and format) be “clearly documented” (see DO-200A 2.3 and its sub-sections, especially 2.3.2).</p>		<p>(DQRs) for the EMD system to be developed and incorporated as part of the compliance documentation.”</p>	
36.	Garmin	1-3, 2.3.1, Note 3	<p>Includes the statement:</p> <p><i>“Until airport map data is made available as part of the AIP, the aeronautical data used in the development of AMMDs shall meet the accuracy, resolution, and assurance level requirements specified in section 2.2.5(6).”</i></p> <p>Issues with this statement include:</p> <ol style="list-style-type: none"> <li>1. This Note includes a “shall” (i.e., a requirement).</li> <li>2. The reference to “<i>section</i></li> </ol>	<ol style="list-style-type: none"> <li>1. Notes are not the place to define requirements, especially since the requirement is already defined in the referenced section.</li> <li>2. The appropriate reference would appear to be 2.2.5 sub-section 4 since compliance with RTCA/DO-200A requires that DQRs be “clearly</li> </ol>	<p>Change the statement to:</p> <p><i>“Section 2.2.5(4) defines the accuracy, resolution, and assurance level requirements for AMMD aeronautical data regardless of whether it originates from the AIP or other sources.”</i></p>	<p><b>Accepted.</b> Comment incorporated into rewritten appendix.</p>

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			<p>2.2.5(6)” is incorrect as 2.2.5 item 6 refers to detecting and annunciating corruption of the EMD database.</p> <p>3. It is not clear how TSO articles that were approved to use databases based on non-AIP data would be required to transition to use “<i>airport map data ... made available as part of the AIP</i>” nor why “<i>the accuracy, resolution, and assurance level requirements</i>” would no longer be applicable simply because airport map data was based on the AIP since Garmin often finds errors in the ARINC 424 navigation data that is based on the AIP.</p>	<p>documented” and the DO-200A processes associated with ensuring these DQRs are complied with would remain in effect regardless of whether the data source is from the AIP or elsewhere.</p>	<p>Note that if Garmin’s suggestion to remove 2.2.5(3) is accepted, then the suggested change to 2.3.1 Note 3 should begin with:</p> <p>“<i>Section 2.2.5(3) defines ...</i>”</p>	
37.	Garmin	1-3, 2.3.1, Note 4	<p>Includes the statement:</p> <p>“<i>When airport map data is made available as part of the AIP, there is no requirement to validate runway and taxiway accuracy of airport map data before it is used.</i>”</p> <p>Again, it is not clear how TSO articles that were approved to use</p>	<p>It is not clear how the transition to using AIP-based databases should occur or why the DO-200A DQR accuracy validation would no longer be required. Furthermore, the proposed change</p>	<p>Restore 2.3.1 Note 3 and remove 2.3.1 Note 4. Otherwise, clarify Notes 3 &amp; 4 to address the specified issues.</p>	<p><b>Accepted.</b> Comment incorporated into rewritten appendix.</p>

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			<p>databases based on non-AIP data would be required to transition to use “<i>airport map data ... made available as part of the AIP</i>” nor why there would no longer be a “<i>requirement to validate runway and taxiway accuracy of airport map data</i>” simply because airport map data was based on the AIP since Garmin often finds errors in the ARINC 424 navigation data that is based on the AIP.</p> <p>Additionally, the changes to 2.3.1 Notes 3 &amp; 4 appear to change the original intent of DO-257A.</p>	<p>seems inconsistent with the original intent of DO-257A.</p>		
38.	Garmin	1-4, 2.3.1.1.1	<p>Under the heading of “Runways”, the “sub-section” numbers should be 5 and 6, respectively, instead of 8 and 9.</p>	<p>Editorial. Since “sub-sections 5 and 6” are being replaced, they should be replaced by sub-sections with the same numbers.</p>	<p>Change sub-section numbers to 5 and 6.</p>	<p><b>Accepted.</b> Comment incorporated into rewritten appendix.</p>
39.	Garmin	1-4, 2.3.1.1.1, sub-section 8 [sic]	<p>Revises the original DO-257A 2.3.1.1.1 sub-section 5 requirement to:</p> <p>“The aircraft position sensor horizontal positional accuracy for own-ship position on runways and taxiways shall be</p>	<p>The context of DO-257A 2.3.1.1.1 is “Runways” while the context of DO-257A 2.3.1.1.2 is “Taxiways”; the requirements should retain the intended</p>	<p>Remove the phrase “<del>and taxiways</del>”.</p>	<p><b>Accepted.</b> Comment incorporated into rewritten appendix.</p>

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			<p>less than 36m.”</p> <p>The revised requirement includes the phrase “and taxiways”, which is unnecessary since DO-257A 2.3.1.1.2 sub-section 3 already requires the same thing for taxiways.</p>	<p>context.</p>		
40.	Garmin	1-4, 2.3.1.1.1, sub-section 9 [sic]	<p>Revises the original DO-257A 2.3.1.1.1 sub-section 6 requirement to:</p> <p>“The aerodrome database accuracy shall meet medium quality as defined in the current version of RTCA/DO-272 or EUROCAE/ED-99.”</p> <p>Issues with this new requirement include:</p> <ol style="list-style-type: none"> <li>1. The requirement reference is to “DO-272” but does not specify which DO-272 revision(s) is (are) acceptable; DO-272C is the current revision. It is unclear whether all DO-272 revisions would be considered acceptable or whether DO-272C would be required.</li> </ol>	<p>It is inappropriate to require the use of DO-272 as a minimum requirement for AMMDs.</p>	<p>Restore the original DO-257A 2.3.1.1.1 sub-section 6 requirement and its related Notes.</p>	<p><b>Accepted.</b> Comment incorporated into rewritten appendix.</p>

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			<p>2. DO-272C Table 4-5 indicates medium quality requires 5 meter accuracy for the majority of data elements listed in the table. Likewise, TSO-C195a paragraph 3.a.(4) specifies that “Databases used to support moving maps integrated with SURF [surface] application must meet at least 5 meter accuracy ...” When Garmin claimed TSO-C195a SURF compliance for its GTN products, a TSO deviation was obtained with respect to the 5 meter accuracy requirement due to concerns about using ARINC 424 runway information having either 30 meter published accuracy or an unpublished accuracy. Garmin’s deviation request demonstrated that the TSO-C195a SURF application 45-meter total error budget (derived from RTCA/DO-322) can be met in both the 30-meter published accuracy case and the unpublished accuracy case because the unpublished accuracy runway positions</p>			

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			<p>were shown to have 30 meter accuracy. See Attachment A of this comments document (below) for the relevant portions of FAA’s acceptance letter for Garmin’s TSO-C195a deviation.</p> <p>As draft TSO-C165a 2.3.1.1.1, sub-section 9 [sic] Note 2 indicates “<i>The aerodrome total database accuracy supports the total accuracy requirement provided in section 3.2.3.</i>” Per DO-257A 3.2.3 “The total system accuracy shall be sufficient for the intended operation and shall not exceed 100 meters (95%).” In particular, DO-257A 3.2.3 Note 5 indicates that data accuracy of 65 meters provides acceptable total system accuracy given the other assumptions for position accuracy, latency, display error, and aircraft reference point bias.</p> <p>Even if the FAA determines the 100 meter total accuracy is</p>			

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			<p>inadequate for AMMD operations and added a new AMMD total system accuracy requirement, at most that requirement should be no more than the TSO-C195a SURF application 45-meter value since it was arrived at through the RTCA SC-186 government/industry consensus process. And given that Garmin has already shown that 30 meter data accuracy is sufficient to meet the more demanding TSO-C195a SURF application 45-meter total error budget, compliance with DO-272’s medium quality 5 meter accuracy requirement is clearly unnecessary “for the intended [AMMD] operation”.</p> <p>See Garmin’s comment on 2.2.5 sub-section 3 for a list of additional issues related to this new requirement.</p>			
41.	Garmin	1-4, 2.3.1.1.2, sub-section 3	<p>Revises the original DO-257A 2.3.1.1.2 sub-section 3 requirement to:</p> <p>“The aircraft position sensor</p>	<p>The context of DO-257A 2.3.1.1.2 is “Taxiways” while the context of DO-257A 2.3.1.1.1 is</p>	<p>Remove the phrase “<del>runways and</del>”.</p>	<p><b>Accepted.</b> Comment incorporated into rewritten appendix.</p>

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			<p>horizontal positional accuracy for own-ship position on runways and taxiways shall be less than 36m.”</p> <p>The revised requirement includes the phrase “runways and”, which is unnecessary since DO-257A 2.3.1.1.1 sub-section 5 already requires the same thing for runways.</p>	“Runways”; the requirements should retain the intended context.		
42.	Garmin	1-4, 2.3.1.1.2, sub-section 4	<p>Revises the original DO-257A 2.3.1.1.2 sub-section 4 requirement to:</p> <p>“The aerodrome database accuracy shall meet medium quality as defined in the current version of RTCA/DO-272 or EUROCAE/ED-99.”</p> <p>See Garmin’s comments on 2.2.5 sub-section 3 and 2.3.1.1.1 sub-section 9 [sic] for a list of issues related to this new requirement.</p>	It is inappropriate to require the use of DO-272 as a minimum requirement for AMMDs.	<p>Restore the original DO-257A 2.3.1.1.2 sub-section 4 requirement and its related Notes.</p> <p>Additionally, correct the indentation of 2.3.1.1.2 sub-section 4 to be consistent with sub-section 3.</p>	<b>Accepted.</b> Comment incorporated into rewritten appendix.
43.	Garmin	1-5, 2.3.1.2, sub-section 7	<p>Specifies a new requirement for:</p> <p>“The AMMD shall provide a means to compensate for installation dependent antenna position bias error (i.e., along</p>	<p>This new requirement:</p> <ul style="list-style-type: none"> <li>• Conflicts with the original DO-257A</li> </ul>	<ol style="list-style-type: none"> <li>1. Remove this requirement.</li> <li>2. If this requirement is not removed then:</li> </ol>	<b>Accepted.</b> Comment incorporated into rewritten appendix. Changed to read: The AMMD shall

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			<p>track error associated with GNSS antenna position to the flight deck). An acceptable means would be a limitation on the GNSS sensor antenna installation position in relation to the pilot's position of 2 meters."</p> <p>Issues with this new requirement include:</p> <ol style="list-style-type: none"> <li>1. It is unclear what purpose this requirement serves within the Aerodrome Moving Map Display requirements. For example, DO-257A 2.3.1.2 sub-section 3 states "If directional data is available, the ownship symbol should indicate directionality." Presumably, the antenna bias error would be used to ensure the "point" of the directional symbol is in the correct location relative to the antenna position. However, 2.3.1.2 sub-section 3 does not <u>require</u> the ability to indicate directionality since it is a "should" not a "shall".</li> </ol>	<p>requirements,</p> <ul style="list-style-type: none"> <li>• May require additional installation expense due to the need for a heading input, and</li> <li>• Is unnecessarily restrictive. E.g., since total system error can be met with a 25 meter bias then why is a 2 meter bias limitation thought to be necessary?</li> </ul>	<ol style="list-style-type: none"> <li>a. Change the "antenna position bias error" phrase to "aircraft reference point bias" to be consistent with the term used in DO-257A 3.2.3 Note 5.</li> <li>b. Change the first sentence to "If a directional ownship symbol is implemented, a means should be provided to compensate for installation-dependent aircraft reference point bias (i.e., along track bias</li> </ol>	<p>provide a means to compensate for installation dependent GPS antenna offset (i.e., along track aircraft reference point bias associated with GNSS antenna position relative to the nose of the aircraft).</p> <p><i>Note: Acceptable means of compliance would be through use of system calibration or a limitation on the GNSS antenna installation position in relation to the nose of the aircraft.</i></p>

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			<p>Consequently, there is no need for this new requirement since the TSO article manufacturer is not required to implement a directional ownship symbol.</p> <p>2. In order to ensure the along-track antenna bias is able to be consistently applied, the AMMD requires a heading input since, as recognized by DO-257A 2.3.1.2 sub-section 4 Note 2, GPS track “<i>will become unreliable when the taxi speed is low relative to turning velocity.</i>” However, as also indicated by DO-257A 2.3.1.2 sub-section 4 Note 2, access to heading is not a minimum requirement for TSO-C165 articles since Note 2 begins with the phrase “<i>Equipment that does not have access to heading ...</i>” So, once again, the purpose of this new requirement is unclear unless the manufacturer chooses to implement a directional ownship symbol and has an installation limitation that requires heading input. Requiring a</p>		<p>associated with GNSS antenna position to the flight deck).</p> <p>c. Change the second sentence to a <i>Note</i> as follows:  “<i>Note: An acceptable means would be a limitation on the GNSS sensor antenna installation position in relation to the pilot’s position consistent with the total accuracy requirement provided in Section 3.2.3.</i>”</p>	

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			<p>heading input is a significant installation expense for the retrofit market which often requires an adapter box to convert synchro heading gyro outputs to a digital format usable by the AMMD.</p> <p>3. The second sentence of the new 2.3.1.2, sub-section 7 is not a requirement but describes an acceptable means. Furthermore, this means may be impractical on many aircraft.</p> <p>4. Specifying a “2-meter” bias via an installation limitation as an acceptable means is inconsistent with the 100-meter total system accuracy requirement specified in DO-257A 3.2.3. In particular, DO-257A 3.2.3 Note 5 indicates that an antenna bias of 25 meters provides acceptable total system accuracy given the other assumptions for position accuracy, data accuracy, latency, and display error. Consequently, a 2 meter bias installation limitation is unnecessarily restrictive.</p>		<p>d. Add a <i>Note</i> indicating the purpose of this requirement since DO-257A 3.2.3 Note 5 is the only text within the entire DO-257A document that uses the term “bias” and then only in the context of the phrase “<i>aircraft reference point bias</i>”.</p> <p>e. Add another <i>Note</i> that addresses equipment that allows multiple position source inputs. E.g., it may be</p>	

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					<p>necessary for the equipment to account for and utilize more than one aircraft reference point bias if the installation instructions do not include a limitation that the antennas must be installed in close proximity.</p>	
44.	Garmin	1-5, 2.5	<p>“unless otherwise specified the test procedures applicable to a determination of equipment performance under environmental test conditions are set forth in RTCA/DO-160G.”</p>	<p>TSO-C165a Section 3.d states “You may use a different standard environmental condition and test procedure than RTCA/DO-160G....provided the standard is</p>	<p>Revise the appendix to not explicitly require DO-160G. The testing requirement should be appropriate for the EMD.</p>	<p><b>Accepted.</b> Comment incorporated into rewritten appendix.</p>

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				appropriate for the EMD.”  This is an apparent contradiction.		
45.	Garmin	1-7 thru 1-11, 2.6.3.1.2, 2.6.3.1.3, 2.6.3.1.10, 2.6.3.2.4	Specifies methods of compliance for new/revised requirements defined previously in draft TSO-C165a Appendix 1.  These will require updates to be consistent with Garmin’s suggested changes.	The methods of compliance need to be consistent with the final requirements.	Update the methods of compliance to be consistent with the final requirements.	<b>Accepted.</b> Comment incorporated into rewritten appendix.
46.	Garmin	1-11, 2.6.3.1.10, sub-section 5	This section states:  “Until airport map data is made available as part of the AIP, the aeronautical data used in the development of AMMDs shall meet the accuracy, resolution, and assurance level requirements specified in the current version of RTCA/DO-272 or EUROCAE/ED-99 for medium quality. [2.3.1]”  As noted in other Garmin comments, the requirement to use DO-272 is problematic. Aside from that issue, it is not clear how	It is not clear how the transition to using the databases without DO-272 medium quality should occur.	The first priority would be to remove this statement based on previous Garmin comments but otherwise, this text needs clarification with respect to how TSO articles that were approved to use databases based on DO-272 would be required to transition to use “airport map data ... made available as part of the AIP”.	<b>Accepted.</b> Comment incorporated into rewritten appendix.

## Public Comment Log

TSO-165a

#	Commenter	Page & Para. No.	Comment	Reason for Comment	Suggested Change	Comment Resolution
			TSO articles that were approved to use databases based on DO-272 would be required to transition to use "airport map data ... made available as part of the AIP".			