

**Comments for Draft Revisions (Not Applicable to Directives; Refer to Directive Management Officer for Directive Comment Format)**



[For detailed instructions on how to fill out the columns below, please see the Instructions sheet.](#)

<b>Comments Submitted By:</b>			John Ferrara, Garmin (Clayton C. Vondrasek), FAA (Chris Moody), NTSB					
<b>Organization:</b>								
<b>Phone:</b>			215-493-2249					
#	Document Name	Page Number	Paragraph Number	Referenced Text	Comment/Rationale or Question	Proposed Resolution	Comment Type (Conceptual, Editorial, or Format)	Disposition/Response to Comment
1	TSO-C157b		12a	TSO C157a effectivity termination	John Ferrara - TSO C157b contains requirements that can not be met with some existing displays. We do not want to preclude or make it burdensome to make new equipment which interfaces to displays with limitations.	1) Allow TSO C157a to remain in effect along with C157b. or 2) Have wording in C157b allowing interface to displays which can not meet all of C157b.	Conceptual	Non Concur - Equipment Class 2 mirrors the original MPS identified in TSO-C157a and therefore does not introduce any new display requirements.
2	TSO-C157b		12b	TSOA	John Ferrara - Typo?	Change to TSO	Editorial	Non Concur - TSOA is Technical Standard Order Authorization, as defined in paragraph 1 of the TSO.
3	TSO-C157b		23a	non-control	John Ferrara - Not sure what this means. I also note that there is activity on going FAA to have FIS-B information approved for use without verification . Is there an official definition of "non-control"?	Remove "non-control"	Conceptual	Partially Concur - "Non-control" is meant to differentiate FIS data communication to the pilot from air traffic control-related data communication, such as clearance delivery. For clarity, will replace the term "non-control" with "non-air traffic control-related".



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4	TSO-C157b	4	5a(1)	Operating instructions	John Ferrara -  1) The operating instructions should be limited to the operation of the equipment and not address the regulatory authorization for the type of use allowed for any aircraft operation. Regulatory approvals for use should be specified by FARs or Advisory Circulars. The TSO should deal with the equipment not regulatory operation in the airspace. The purpose of the operating instructions should be to allow the ACO to judge if the equipment meets the technical requirements.	Delete all of item 1 except the first line of item 1.	Conceptual	(1) Non Concur - The required Operations Manual language specified in this paragraph is intended to ensure that specific information on technical limitations and proper operational use of the FIS-B equipment, which is essential to its safe use, is provided to operators with the equipment.
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5	TSO-C157b	4	5a(1) continued	Operating instructions	John Ferrara -  2) I note that a manual supplied to the ACO for TSO approval does not mean it will ever get to the pilot. I don't think we want the FAA in the loop for the users manuals provided by the manufacturer to the pilot.  3) The intent was that all SBS changes to the system would be implemented before the TSO was issued. If this is not the case "c" and "e" should be explained in detail. The reader will not know what to do for "c" and "e".  4) (d) says FIS-B uplink is an "approved source". I don't think that is true today.	Delete all of item 1 except the first line of item 1.	Conceptual	(2) Non Concur - Paragraph 7(a) requires an operating manual and equipment limitations be supplied to each recipient of the TSO article (owner/operator). The required Operations Manual language specified in this paragraph is intended to ensure that specific information on technical limitations and proper operational use of the FIS-B equipment, which is essential to its safe use, is provided to operators with the equipment.  (3) Partially Concur - Paragraphs 5.a(1)(c) and 5a(1)(e) have been deleted. We intend to address these issues via NOTAM.  (4) Partially Concur - For Class 1 equipment, FIS-B uplink is an FAA approved source for METAR , TAF, WINDS, PIREPs, NEXRAD, AIRMET, SIGMET, and TFR information. FIS-B uplink is not an approved source for NOTAMS. A statement about NOTAMS will be included for clarification.

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6	TSO-C157b	Page 2	3.b.(3)	(3) Design the system to at least these failure condition classifications.	<p>Clayton C. Vondrasek - 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:</p> <p>“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 may be justified for certain cases and accepted during the ETSO process but will lead to installation restrictions.”</p>	Re-work this section to match the EASA wording. Or work with industry to develop an agreed to wording.	Conceptual	Partially Concur - This wording is in accordance with the current TSO template. We will maintain the wording here in accordance with the current standardized template language, but will forward this comment to the appropriate personnel which manage the TSO template.
7	TSO-C157b	Page 4	4.b.(2)	Each subassembly of the article that you determined may be interchangeable.	Clayton C. Vondrasek - The language for this requirement is confusing. This could mean that a stuffed printed circuit board	Suggest removing the statement or if removing causes problems, work with industry to establish wording that is better understood.	Conceptual	Partially Concur - This wording is in accordance with the current TSO template. We will maintain the wording here in accordance



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					needs the TSO number.			with the current standardized template language, but will forward this comment to the appropriate personnel which manage the TSO template.
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8	TSO-C157b	Page 6	5.e	TSO paragraph 5.e and its 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.	Clayton C. Vondrasek - TSO paragraph 5.e 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 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	Adjust the wording in the TSO (and template) to be consistent with the 8110.4C CHG 4 intent.	Conceptual	Partially Concur - This wording is in accordance with the current TSO template. We will maintain the wording here in accordance with the current standardized template language, but will forward this comment to the appropriate personnel which manage the TSO template.



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9	TSO-C157b	Page 8	7.b	TSO paragraph 7.b contains wording that is inconsistent with Order 8110.4C CHG 4.	Clayton C. Vondrasek - TSO paragraph 7.b includes additional guidance about what furnished data should be provided to an operator or repair station when the equipment includes a non-TSO function. The problematic guidance states "include one copy of the data in paragraphs 5.e.(1) through 5.e.(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.	Adjust the wording in the TSO (and template) to be consistent with the 8110.4C CHG 4 intent	Conceptual	Partially Concur - This wording is in accordance with the current TSO template. We will maintain the wording here in accordance with the current standardized template language, but will forward this comment to the appropriate personnel which manage the TSO template.
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10	TSO-C157b	Page 5	5.a(1)		<p>Chris Moody - My only comment relates to the para (c) and (e) below:</p> <p>(c) "Until the Current Report List (CRL) requirements specified in RTCA/DO 358 paragraph 2.2.5 for NOTAM-TFR, AIRMET, and SIGMET are provided by the Surveillance and Broadcast Service (SBS) FIS-B ground system, these product reports may not be current and complete."</p> <p>(d) "FIS-B uplink is an FAA approved source for METAR , TAF, WINDS, PIREPs, NEXRAD, AIRMET, SIGMET, and TFR information subject to the range limits for the broadcast of these products."</p> <p>(e) "Currently the SBS FIS-B ground system identifies text and graphic records for SIGMETS and AIRMETs which may allow a misassociation by the avionics—although the probability is low. This problem does not affect NOTAMs."</p>	<p>Could we also convey somehow that these limitations are temporary and planned to be fixed relatively soon(&lt;1 yr).? Perhaps they could be grouped together under a separate heading for Class 1 equipment about shortcomings of the ground system that are being fixed? And also allowing them to be omitted if the applicant's approval happens after they are fixed.</p> <p>Or could they be just "advisory" notifications to mfrs?</p>	Conceptual	<p>Concur - Paragraphs 5.a(1)(c) and 5.a(1)(e) have been removed. We intend to address these issues in a NOTAM.</p>
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