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AC 20-173

#	Commenter	Page & Para. No.	Comment	Reason for Comment	Suggested Change	Comment Resolution
1.	Bernie Newman, Astronautics Corporation of America (ACA)	5.e	Replace “A typical partitioned EFB” with “One such means could be an EFB that ...”.			Partially Accepted. Changed to “One means to partition an EFB is to create two physically separate systems...”
2.	Bernie Newman, Astronautics Corporation of America (ACA)	5.e	Replace “Both environments may” with “In this instance, both environments may...”			Accepted.
3.	Bernie Newman, Astronautics Corporation of America (ACA)	5.e	Before the sentence starting “Partitioning must guarantee” add “Another such means could be an EFB with a single processor and a single certified OS that maintains a partition between EFB Type A/B applications and approved applications.”			Partially Accepted. Another example is not necessary, especially without the details. Changed to read “Other means of partitioning may be acceptable; however, partitioning must guarantee required throughput and resources (memory, hard drive, avionics data, etc.) for approved applications.”
4.	Bernie Newman, Astronautics Corporation of America (ACA)	5.e	Replace “Partitioning must guarantee...” with “Regardless of the means, partitioning must guarantee...”			Partially Accepted. See previous comment.
5.	Bernie Newman, Astronautics	5.e.(2)	Replace “This configuration would usually include ... to prevent” with “This EFB			Partially Accepted. Changed to read “This EFB configuration must include

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	Corporation of America (ACA)		configuration must include partitioning means to prevent ..." and add at the end: "One such configuration could include physical separation in the form of multiple OS's and processors. Another such configuration could include logical separation enforced by a single processor and OS."			means of partitioning or protection to prevent the hosted Type A/B applications from having any adverse effects on the approved software and other aircraft systems." Examples no longer necessary.
6.	EASA	General	This AC 20-EFB contains parts which were previously published by the FAA as AC 120-79B draft. Does the FAA intend to publish an update of the AC 120-76A?	Question	No change proposed	Acknowledged. Yes, AC 120-76B just finished public comment and should be published soon.
7.	EASA	2, §4.d	There is no definition about what is "portable" or "installed". In this section the expression " <i>installed as part of the aircraft type design is used</i> ". Is it the intention to consider everything portable if not certified as part of the aircraft design? EASA currently considers that to have portable components in the Avionics Bay (i.e. outside the cockpit area and	There are no criteria to determine what could be considered as portable component.	Suggest adding conditions or definition for portability.	Accepted. Paragraph 3, Scope, and Paragraph 4d have been updated to provide clarity on portable and installed EFB definitions.

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			not accessible by the pilots) would not be acceptable.			
8.	EASA	2, §4.d	<p>“They may have some components installed, but not a complete system, or the hardware is all installed, but is designed to accommodate Type A and B flight bag applications”</p> <p>Does the FAA really intend to classify a fully installed system as Class 2 EFB, when only Type A& B applications are accommodated? Is this in line with AC 120-76A?</p>	<p>Statement seems contradictory to section 5.e. Processor and Partitioning and (2) EFBs hosting Type A/B Applications and Approved software. EASA considers fully installed system as Class 3 EFB independently from the hosted application types.</p> <p>EASA and FAA should find a common definition and classification for this kind of EFB arrangements, otherwise problems for validation exercises predictable.</p>	EASA and FAA should establish a common understanding of this issue.	<p>Accepted. Sentence deleted.</p> <p>The FAA does not intend to classify a fully installed system as a Class 2 EFB. Throughout this document the FAA refers to Class 3 EFBs as installed systems. A fully installed system running Type A&B applications would be referred to as a Class 3 EFB in accordance with AC 120-76A or 120-76B language.</p> <p>AC 120-76B continues to use the term “Class 3” EFB, while AC 20-EFB uses the term “installed.” The meaning is consistent. The FAA chose the “installed” terminology in AC 20-EFB to be consistent with overall aircraft certification processes and terminology.</p>
9.	EASA	3-4, §5.a	The mounting device guidance does not include requirements to have portable EFB controls	EASA considers that easy way should be provided to shutdown computer (when it is	Consider the need to have means to shutdown COTS computer when	<p>Accepted. Changed 5.b.(1) 1st sentence to read: “A means, reachable by the pilot seated at the</p>

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			accessible. AC 20-176A requires: “The design of the mount should allow the user easy access to the EFB controls”	considered a PED).	attached to a docking station not reachable from pilot seated position.	controls, should be provided for de powering the EFB or power port (e.g., access to unplug the EFB, or a separate switch clearly labeled for the power port).”
10.	EASA	Page 4, §5b(1)	Does this sentence require the installation of a switch in any case?	EASA requires the switch only when it is not easily possible to remove or unplug the portable part of the system!	EASA and FAA should establish a common understanding of this issue.	Accepted. Changed 5.b.(1) 1st sentence to read: “A means, reachable by the pilot seated at the controls, should be provided for de-powering the EFB or power port (e.g., access to unplug the EFB, or a separate switch clearly labeled for the power port).”
11.	EASA	5, §5.c	EFBs may transmit data to aircraft systems. Is this limited to transmit information for AAC purposes (as requested in AC 20-176A)?	Intended function is not clear and security aspects are not addressed.	EASA and FAA should establish a common understanding of this issue.	Acknowledged. The design of any connectivity to aircraft systems must ensure non-interference. AAC restriction does not necessarily ensure non-interference, but will likely remain in 120-76.
12.	EASA	6, §5.d	Shared use of displays (avionics and non certified EFB applications) is not addressed here.	It is not clear if this will be allowed for portable EFBs (full or partial)	EASA and FAA should establish a common understanding of this issue.	Accepted. Changed 1 st sentence of 5.d to read: “This section provides design guidance for the installation of EFB displays, including installation of shared

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						displays supporting both portable EFBs and installed systems.” Both ACs 25-11 and 23.1311-1 referenced in the AC would be the proper means to address shared displays.
13.	EASA	Page 6, §5d(3)	Compliance with TSO- C113 standard should be considered by itself not enough.	TSO C-113 is quite old material (1986)		Accepted. Updated to calling out SAE 8034B instead of TSO-C113. We also state the guidance in AC 25-11 or AC 23.1311-1 serves as recommended design guidance.
14.	EASA	Page 6, §5d(3)	AC 25-11A should be referenced instead of AC 25-11	AC 25-11A is now published	Refer to AC 25-11A	Not Accepted. Per para 7 and our standard practice “All references to FAA documents in this AC are to the current version.”
15.	EASA	7, §5.e.(1) Note	“the AMMD application is designed to reside with the Type A/B applications found in the EFB and does not have to be installed”	Meaning of “installed” in this context is unclear	Suggest to change “installed” by “certified as part of the aircraft type design”	Accepted. Changed Note to read: “Note: AC 20-159, <i>Obtaining Design and Production Approval for Airport Moving Map Display and Airport Surface Situational Awareness Applications Hosted In Electronic Flight Bags (EFBs)</i> , provides a means to

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						obtain a software-only technical standard order (TSO) authorization for airport moving map display (AMMD) and surface cockpit display of traffic information (CDTI) applications designed to reside with the hosted Type A/B applications.”
16.	EASA	7, §5.g	Section does not addresses requirements for batteries which are part of the installed components	More guidance is needed	Address requirements for batteries which are part of the installed components.	<p>Accepted. Changed to read “Rechargeable lithium batteries (typically lithium-ion and lithium-polymer (lithium-ion polymer)) have higher energy levels than previous rechargeable batteries and also have higher flammability potential, so it is important to take precautions in their use. If mistreated, or not manufactured and maintained to industry safety standards, rechargeable lithium batteries can become hazardous. Installed EFBs employing rechargeable lithium batteries must ensure the lithium ion batteries meet airworthiness standards appropriate for the</p>

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						<p>battery size and intended function. The use of rechargeable lithium batteries in portable devices is the responsibility of the operator.</p> <p>Currently the standard is DO-311, but SC-225 is working on new standards which will be more applicable to these components. Until those are mature we do not have any guidance that is specific enough to point to for EFBs.</p>
17.	EASA	8, §6.c.(1)	“The use of Type A and B applications in portable devices ...”. This section should not limit only to Type A and B in portable devices.	No distinction should be made to Type A and B applications in installed devices segregated from Type C applications if any	Suggest following wording: “The use of Type A and B applications not installed as approved software as per 5.e.(3) ...”	<p>Accepted. Changed to read: “(1) Typically, the failure condition classification of Type A/B applications, as defined in AC 120-76, is considered to be minor or no effect. AC 120-76 provides allowances for use of these applications on EFBs based on an equivalent level of safety to the paper reference material or operational process. When the Type A/B application is installed as part of aircraft type design or as an alteration, you may consider malfunction of the</p>

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						Type A/B application to be a minor failure condition classification and loss of the Type A/B application to have no safety effect, or you may accomplish a system safety assessment to determine the appropriate failure condition classification”
18.	EASA	general	Guidance for editing AFM/AFMS information missing, the note in §5a(7) is only covering one special aspect.	General guidance on this subject would be helpful for applicants and Authorities.	Certification Documentation chapter should be added.	Accepted.
19.	AirTran Airways	Page 3 Paragraph a.(8)	Velcro should not be considered a mounting device.	Velcro is designed for temporary securing of objects, which should be addressed in AC120-76B.	Delete Paragraph 5.a.(8)	Not Accepted. The FAA recommends against the use of hook and loop style fasteners. However, currently, if an applicant can demonstrate that the hook and loop style fastener meets airworthiness requirements, there is no prohibition from use.
20.	AirTran Airways	Page 5 Paragraph c.	Connectivity to Aircraft Systems should be specifically limited to aircraft data bus, flight management and flight control systems.	Internet connections on aircraft that are available to the passengers pose no threat to the safety of flight and EFB systems should be allowed transmit and	This connectivity includes data bus and communication systems access (e.g., through an avionics data bus or communications management unit).	Not Accepted. Regardless of the source of data connection, the prevailing requirement is that the EFB does not interfere with installed systems on the aircraft.

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				receive connectivity to these types of systems.		
21.	Volpe	pg. 3/ Par 5a.1	EFB installations may impede/limit pilots' movement on the flight deck or require substantial adjustments in body position to arrange EFB (including when placing EFB into or removing from stowage).	If mounting device restricts accessibility to EFB in certain positions and major adjustments in body position are required, workload and distraction may be increased. When mounting an EFB, stowage area should be considered in addition to placement for regular use.	Under Mounting device and accessibility subsection 1, add the following text: "The mounting device should allow the EFB, when in the mount, to be easily viewed without requiring major adjustments to body position."	Partially Accepted. Changed last sentence to read: "If the EFB is installed, the EFB display must be easily viewed and the controls easily reached without requiring major adjustments to body position. Note: Evaluation of a portable EFB display is accomplished by the operator in accordance with AC 91-78 or AC 120-76."
22.	Volpe	pg. 3/ Par 5a.4	EFBs must be stowed during certain phases of flight. The considerations for stowage mounting are similar to "regular use" mounting, but should be reiterated.	In order to prevent interference to crew performance or damage to aircraft systems, the correct mounting of EFBs in the stowage area is just as important as the mounting for regular use.	Under Mounting device and mount stowage subsection 4, add the following text: We recommend use of AC 120-76 for additional mounting stowage guidance.	Not Accepted. Agree that the mount must not interfere with crew performance when stowed, however we believe the interference guidance in the parent paragraph (para 5.a.) adequately addresses this concern.
23.	Volpe	pg. 6/ Par 5d.1	Glares and viewing angles are important components of readability.	Additional details about glare and visual field will provide a better understanding of the importance of	Under Displays and Placement subsection 1, add the following text:	Partially Accepted. Agree that glare and visual field are important considerations during the approval of installed EFBs.

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				EFB display and placement.	[after 3 rd sentence] “In the position in which it is intended to be used, the EFB should not produce objectionable glare or reflections that could adversely affect the pilot’s visual environment. Additionally, a 90-degree viewing angle may be unacceptable for certain EFB applications if aspects of the display quality are degraded at large viewing angles (e.g., the display colors wash out or the displayed color contrast is not discernible at the installation viewing angle).”	Paragraph 5.d.(1) addresses glare and visual field. Paragraph 5.d.(3) also recommends use of the industry display standards AS 8034B.
24.	Volpe	pg. 7/ Par 5f	Crewmembers have different body types and sizes and physical abilities, but controls must still be easily accessible for all pilots. In addition to “turbulence,”	It is important to consider the accessibility and reach to the controls for all pilots.	Under Controls, add the following at the beginning: “All EFB controls must be within reach of the appropriate	Partially Accepted. Text regarding “normal vibrations” was added. Otherwise, reachability is covered by normal airworthiness rules.

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			“other normal vibrations” is another example of flight deck environmental factors.		crewmember seated normally on the flight deck. ...” In second sentence, after turbulence, add “and other normal vibrations, ...”	
25.	Atlanta ATA EFB users group	General	AC-120-76B comments Atlanta meeting of ATA members.	Consider changing the scope of this AC to support the Mounting, Power and connectivity issues of all EFB systems, not just “installed” systems.	Removing the Mounting, Power and Connectivity items from AC-120-76B.	Partially Accepted. Scope revised. This AC is applicable to the mounting, power, and data connectivity issues of all EFB systems, not just “installed” systems. Specific AC-120-76B changes are out of scope for this document. As this comment affects AC 120-76B, This comment is being provided for consideration in that document.
26.	Atlanta ATA EFB users group	General	AC-120-76B comments Atlanta meeting of ATA members.	We suggested changing the CLASS definition. See comments to AC120-76B.	Class 1 – No aircraft connectivity Class 2 – Aircraft connectivity Class 3 – Suggest removing this class because they are Certified Avionics.	Partially Accepted. Specific AC-120-76B changes are out of scope for this document. As this comment affects AC 120-76B, This comment is being provided for consideration in that document.
27.	Atlanta ATA EFB users	General	AC-120-76B comments Atlanta meeting of ATA	We suggested addressing two	Suggest moving all temporary mounting	Not Accepted The FAA discourages the use

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	group		members.	separate mounting types, Temporary <i>Velcro</i> <i>Suction cups</i> Permanent <i>STC mounting</i>	language to AC-120-76B and maintaining Permanent mounting with in this AC.	of hook and loop style fasteners for all EFB mounting. However, if an applicant can demonstrate that the hook and loop style fastener meets applicable airworthiness requirements we are not prohibiting its use at this time.
28.	Southwest Airlines	P1, 3 Scope	<i>“Portable EFBs and EFB components are outside the scope of this AC.”</i>	Somewhat confusing when using the term “Portable EFB”.	Suggest clarifying that this “AC applies specifically to Installed EFB components.”	Accepted. Amended scope to clarify as follows: “This AC addresses installation of EFBs, EFB components, and provisions for EFB connectivity installed as part of aircraft type design or installed as an alteration. Portable EFBs and portable EFB components are outside the scope of this AC.”
29.	Southwest Airlines	P1, 4 Background	<i>“Portable EFBs are considered portable electronic devices (PEDs). Portable EFBs and EFB components are not subject to airworthiness regulations or limitations, and are not covered in this AC.”</i>	Somewhat confusing when using the term “Portable EFB”.	Suggest clarifying that this “AC applies specifically to Installed EFB components.”	Accepted. Clarified by changing scope to read: “In the context of this AC, EFB components are “installed” when they are incorporated into aircraft type design under 14 CFR part 21 or as a proper alteration under 14 CFR 43.3. All other EFB components are considered

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						<p>“portable,” regardless of how often they are removed from the aircraft. There are operational restrictions on the use and capability of portable EFB components. Design of portable EFB components is outside the scope of this AC.”</p>
30.	Southwest Airlines	P4, 8 Velcro	<p><i>“We do not recommend use of Velcro type hook and loop fastener material for mounting or securing the EFB to a mount, or the aircraft, because the closure strength of Velcro degrades with each use.”</i></p>	<p>What will be the specific requirements for the use of Suction Cups?</p>	<p>Adding an additional section to cover various Temporary mounting options and their mandates.</p>	<p>Not Accepted. This airworthiness guidance addresses components that are installed or attached to the aircraft. Suction cups require no material be attached to the aircraft, so they are not considered in this guidance. As this comment affects AC 120-76B, it is being provided for consideration in that document.</p>
31.	Southwest Airlines	P4, b. Power	<p><i>“This section applies to design considerations for installing power provisions for portable EFBs. Install EFB power provisions addressing applicable airworthiness regulations. Design EFB power provisions to include:”</i></p>	<p>Misspelling or unintentional use of the word “Install”.</p>	<p>Change Install to installed or remove the word entirely.</p>	<p>Partially Accepted. Changed 1st and 2nd sentence to read: “This section applies to design considerations for installing power port and cabling provisions for portable EFBs. Installed EFB power provisions must address applicable airworthiness regulations.”</p>

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32.	Southwest Airlines	P4, b. Power		USB power outlet?	Provide guidance on installing a USB outlet for charging?	Not Accepted. Use of a USB power outlet for an EFB is no different from any other power outlet, it is one power interface the applicant may use.
33.	Southwest Airlines	P5, 3. Power Source	<i>“Connection to more critical aircraft power buses is permitted if the intended function of the EFB warrants, but the ability of the crew to de-power the outlet for the EFB is paramount and must be addressed.”</i>	Can this be accomplished by unplugging the connection between the EFB and the aircraft power source, since the device must be removable by the Pilot as a qualifying requirement already?	Request clarification.	Accepted. Changed 5.b.(1) 1st sentence to read: “A means, reachable by the pilot seated at the controls, should be provided for de-powering the EFB or power port (e.g., access to unplug the EFB, or a separate switch clearly labeled for the power port).”
34.	Southwest Airlines	P5, c, Data Connectivity	<i>“This section applies to interfacing with portable and installed EFBs.”</i>	Operators should have the option to utilize a wired or wireless access to an installed STC’d Wifi entertainment system that does not transmit or receive data from aircraft systems.		Accepted. If no connection to aircraft control domain, then use is considered under AC 120-76.
35.	Southwest Airlines	P6, 2 Screen Size and Resolution	<i>“The screen should be large enough to show the entire IAP chart at once, with the equivalent degree of legibility and clarity as a paper chart.”</i>	This is impossible with a foldout chart like terminal arrivals and expanded ILS procedures such as LAX.	Suggest the requirement be to be able to display the entire chart for chart awareness, but allow for panning and zooming for	Accepted. This wording is consistent with the text found in AC 120-76 guidance. It’s intent is to drive size consideration for “standard” IAP, not the exceptions. Changed 2 nd

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					appropriate sections of the chart as necessary.	sentence to read “standard” IAP.
36.	Goodrich	Page 3 / Section 5.a (1 st paragraph)	The paragraph does not appear to clearly state if the evaluation of external vision includes just the mounting device, or the mounting device with the EFB attached. Also, the obstruction of external vision could be clarified with a reference to AC 25.773-1.	The placement of the EFB and mounting device is important for both certification and also human factors. Therefore additional clarity and less subjectivity will aid in the certification of this part of the EFB solution.	Provisioning of <i>the mounting device with the EFB unit installed</i> must not <i>significantly</i> obstruct visual or physical access to aircraft controls and displays, flight crew ingress or egress, or external vision.	Partially Accepted. This airworthiness guidance addresses components that are installed as part of aircraft type design. We are somewhat limited in placing certification requirements on portions of the EFB system that are not installed. XX.773 considerations for portable equipment are the responsibility of the operator per AC 120-76.
37.	Goodrich	Page 3 / Section 5.a.3 (4 th paragraph)	The crashworthiness of an installed EFB should be more than considered.	The crashworthiness of all installed EFB systems should adhere to industry standards.	Replace first sentence: Consider crashworthiness in the design of this device. With: <i>RTCA/DO-160 Section 7 shall be considered an acceptable means of addressing crashworthiness.</i>	Partially Accepted. Changed 1 st sentence to read “The design must address applicable crashworthiness regulations.”
38.	Goodrich	Page 3 / Section 5.a.5 (6 th paragraph)	In the first sentence, the term “not hang loosely” is not clearly defined. We suggested deleting this first	Add clarification and make the paragraph about the hanging/loose cables.	Delete first sentence: If the EFB required cabling to mate with aircraft systems or	Partially Accepted. Moved to 5.b.(5) and changed the 1 st sentence is changed to read “If cabling is

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			<p>sentence and cover the hanging cable scenario with an “exposed cable” term in the second sentence. This would make the entire paragraph about the loose or hanging cables and would no-longer reference cables run inside of the mount.</p>		<p>other EFBs, and if the cable is not run inside the mount, the cable should not hang loosely.</p> <p>Also, modify the second sentence to read: Flight crewmembers should be able to easily secure the any <i>exposed</i> cables out of the way during aircraft operations (e.g., cable tether straps).</p>	<p>installed to mate aircraft systems with an EFB, the cable should not hang loosely and provisions should be made to easily secure any exposed cables out of the way during aircraft operations (e.g., cable tether straps).”</p>
39.	Goodrich	Page 4 / Section 5.b (7 th paragraph)	<p>This section appears to only apply to portable EFB systems (i.e. Class 1 or Class 2 EFBs), although it is not clear. Most of the AC is applicable to installed EFB systems and now this section is application to portable EFBs and as such, it could cause some confusion.</p>	<p>Clarify the applicability of the guidelines to he type of EFB system (i.e. portable and installed EFBs).</p>	<p>Change first two sentences to read: This section applies to design considerations for installing power provisions for <i>both</i> portable EFBs <i>and installed EFBs</i>. Installed EFB power provisions <i>should also address</i> applicable airworthiness</p>	<p>Partially Accepted. This section is intended to provide guidance on the installed power port that powers portable EFBs. Changed 1st sentence to read “This section applies to design considerations for installing dedicated power port and cabling provisions for portable EFBs components.”</p>

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					regulations.	
40.	Goodrich	Page 4 / Section 5.b.2 (last paragraph)	What is the definition of “outlet”	Does the term “outlet” mean a traditional type outlet (3-prong) or a power supply.	Define outlet as (e.g. 3-prong).	Accepted. Changed to read “If a fault is detected, the power to the power port should be automatically deactivated.”
41.	Goodrich	Page 5 / Section 5.c.2.a (6th paragraph)	The applications covered by AC 20-159 should be an exception to this requirement.	Clarification for applications covered by AC 20-159.	Add or reference the Note on top of Page 7 to this section.	Partially Accepted. Added note after 5.e.(1) addressing AC 20-159 applicability.
42.	Goodrich	Page 5 / Section 5.c.2.b (last paragraph)	There could be cases where an EFB system could have an affect on other aircraft systems. In these cases, it may be a challenge to ensure an EFB system does not adversely affect other systems.	A System Safety Assessment (SSA) should be an acceptable means of compliance with this requirement.	Modify the first sentence to read: The design must include a means to ensure that EFB operation, malfunction, or failure does not adversely affect other installed aircraft systems to which connection is made, <i>or such adverse affect does not impact safe operation of the aircraft.</i>	Partially Accepted. Changed 1 st sentence to read: “The design must include a means to ensure EFB operation, malfunction, or failure does not adversely affect safe and continued operation of other installed aircraft systems to which connection is made.”
43.	Goodrich	Page 5 / Section 5.c.2.b (last paragraph)	Should virus, worm sentence be included in this section? It seems to be a software issue.	This seems to be a software security issue and not a hardware design issue.	Suggest either deleting this sentence, or moving it to Section 6.b (Software).	Not Accepted. Protection from this type of event must be through the architecture.
44.	Goodrich	Page 6 /	The placement of the EFB	Day and night testing	Change 4 th sentence	Partially Accepted.

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		Section 5.d.1 (2 nd paragraph)	display is important for both a certification and human factors standpoint. In many cases, the same EFB system is installed in nearly the same location across a variety of aircraft types. Considerations for the similarities and/or service history should be considered for this requirement.	<p>should not be the only means of compliance for EFB display placement.</p> <p>Also, credit should be granted for systems already tested or service history in place of an ELOS for each and every installation of a same or similar EFB system.</p>	<p>to read: For applicants seeking compliance under 14 CFR § 25.773 for installed displays, flight testing in day and night conditions is the <i>an</i> acceptable method to find compliance for these issues.</p> <p>Add to onto last sentence to read: Applicants may develop equivalent level of safety (ELOS) justifications for alternate means of compliance, provided they are formally requested and agreed to by the FAA in advance, <i>or demonstration of previous completed ground or flight testing or service history may be considered an alternative means of compliance.</i></p>	<p>Unfortunately even though the logic may be pretty direct on this solution, this is tied to a regulation that must be complied with or an ELOS must be determined based on an applicant’s justifications for alternate means of compliance. This must be on a case-by-case basis and the applicant will always have to submit for it up front. Added last sentence to read “Analysis, simulation, and demonstration of previously completed ground, flight testing, or service history on a similar platform may be considered when developing an alternative means of compliance.”</p>

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45.	Goodrich	Page 6 / Section 5.e (5 th paragraph)	We agree with the content and the intent of this section. Our comments are based on providing an alternate means of compliance if a hard-partitioning is not used, as long as the design demonstrates ELOS for non-partitioned designs.	Any EFB system that uses a non-partitioned designed should have an ELOS to a design with a hard-portioned design. Also, clarification for certified OS.	Change second sentence to: Partitioning for an installed EFB <i>shall</i> be done via hard-partitioning with physical separation between OSs, processors, etc., <i>or demonstration equivalent level of safety or robustness of a non-partitioned design.</i> Define certified OS in third sentence to read: A typical partitioned EFB contains two separate systems feeding into a common installed display with a commercial-off-the-self (COTS) processor and OS hosting EFB Type A/B applications, and a certified processor and <i>deterministic</i> OS environment for approved software	Not Accepted. A means of partition or protection is required. A non-partitioned design merely has the partition at the aircraft firewall and not internal. An ELOS is not an acceptable means for determining whether Type A and B applications will have no adverse effects on aircraft systems.

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					applications.	
46.	Goodrich	Page 7 / Section 5.g (4 th paragraph)	The paragraph does not specify what party is responsible for the lithium battery for installed EFB systems. It only addresses the responsibility for portable EFB systems.	Define responsibility for lithium batteries on installed EFB systems. There is a TSO that covers these types of batteries (TSO-C179)	Add a sentence at the end of the paragraph to read: <i>The use of rechargeable lithium batteries in install devices is the responsibility of the design manufacturer (e.g. TSO-C179).</i>	Partially Accepted. See comment #16.
47.	Goodrich	Page 8 / Section 6.a.2 (3 rd paragraph)	A reference to RTCA/DO-160 would help provide guidance for this requirement when it is appropriate.	Help with guidance material.	Add reference to RTCA/DO-160	Not Accepted. Reference to AC 21-16 is used as a more complete reference.
48.	AIRBUS	Page 2 / Para. 4.c	Paragraph of the AC to which the comment relates: “wiring (both power and data up to, but not including, the portable device)” Wiring between an installed docking station and the Portable EFB to be hosted in this docking station should be considered as portable	Generally, installed connectors are standardized. However, Portable EFB connectors may differ from one Portable EFB to another one (COTS technology) and make wiring specific from one Portable EFB to another one. Therefore, only the Operator can control the definition of the wiring: one end must be in accordance with the installed aircraft	“wiring (both power and data up to, but not including, the portable device and wiring specific to the portable device)”	Partially Accepted. Paragraph is now more specific about applicability to only installed components and provisions. Now reads: “Airworthiness regulations apply to installed EFB components. They do not apply to portable EFB components other than for specifications associated with the installed components (i.e., mounting (size and weight), power (maximum electrical load), and data connectivity (input/output specifications and security)).”

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				connector (which is defined by the TC or STC holder); the other end in accordance with the Portable EFB connector (which is Operator’s responsibility). In other words, only the wiring specific to one aircraft (e.g. between aircraft systems and the docking station) and independent of the Portable EFB connectors should be considered as installed.		
49.	AIRBUS	Page 3 / Para 5.a.(2)	Paragraph of the AC to which the comment relates: “Mounting design must address the 14 CFR § 25.789 requirements for the retention of items of mass for the expected load factors anticipated when in use,” AI comment: 14 CFR § 25.789 is not considered as applicable and requirements for the retention of items of mass are considered as	A Portable EFB is not an item of mass that is part of the airplane Type Design, therefore § 25.789 is considered as not applicable. The requirement considered as applicable by Airbus is CS 25.561(c). It is recognized that the maximum Portable	Delete the following last sentence of the paragraph : “Mounting design must address the 14 CFR § 25.789 requirements for the retention of items of mass for the expected load factors anticipated when in use,”	Accepted. Deleted sentence and added the following last sentence to 5.a.(3): “For part 25 aircraft, mounting design must address the 14 CFR § 25.789 requirements for installed EFB components.”

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			already addressed by Para 5.a.(3) "Crashworthiness".	EFB mass is in the realm of what is normally classed and certified by the TC holder as "any other large masses" (ref: 14 CFR § 25.561(c)).		
50.	AIRBUS	Page 3 / Para 5.a.(5)	Paragraph of the AC to which the comment relates: "For part 25 airplanes, these cables are considered electrical wiring interconnection systems (EWIS) and therefore need to comply with 14 CFR part 25, subpart H, and 14 CFR § 26.11." AI comment : This requirement should be considered as applicable only to installed wiring	See comment 1 about Page 2 / Para. 4.c	"For part 25 airplanes, installed cables are considered electrical wiring interconnection systems (EWIS) and therefore need to comply with 14 CFR part 25, subpart H, and 14 CFR § 26.11."	Accepted.
51.	AIRBUS	Page4 / Para 5.a.8 (b)	Use of AFM to address procedure for fastening Velcro seems operationally inappropriate		The proposal is to set up a placard or visual means (e.g. Velcro color) to detect improper Velcro sealing	Accepted. Added Note to state: "The use of a label or placard may be appropriate to address proper fastening of the hook-and-loop fasteners."
52.	AIRBUS	Page 4 / Para 5.b.(1)	Paragraph of the AC to which the comment relates: "Installed Switch. Provide a means for a clearly labeled on/off switch for de-	Airbus considers this requirement as too much design prescriptive. Airbus suggests that the AC	Replace the current sentence by the following wording from FAA AC 120-76B draft (Page 12 /	Accepted. Changed 5.b.(1) 1st sentence to read: "A means, reachable by the pilot seated at the controls, should be provided

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			powering the power outlet.” AI comment: Installed switch is one means but not the only means for protecting the aircraft electrical network.	stays objective-oriented and that the solution to meet the objectives be defined by the applicant. Airbus suggests here below what would be the objectives and that several solutions are possible to meet these objectives: The aircraft electrical power source supplying the PED (Portable EFB) should be designed such as it may be deactivated at any time. If the flight crew cannot quickly remove the plug, which is used to connect the PED to the aircraft electrical network, an alternate means should be provided to quickly stop powering the PED. If a manual means (e.g. on/off switch) is used, this means should be	Para 10.h.) : “There is a requirement for a certified means (other than a circuit breaker) installed in accordance with applicable airworthiness regulations for the flightcrew to de-power the EFB power source or system charger”	for de-powering the EFB or power port (e.g., access to unplug the EFB, or a separate switch clearly labeled for the power port).”

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				clearly labeled. If an automatic means is used, the applicant should describe the intended function and the design of the automatic feature and should substantiate that the objective of deactivating the PED power source when required to maintain safety, is fulfilled		
53.	AIRBUS	Page 4 / Para 5.b.(2)	Paragraph of the AC to which the comment relates: “Automatic reset features should not be permitted.” AI comment : Possibility to allow automatic reset or not should be an outcome of a safety assessment by the applicant and not required by the AC.	Automatic power off can be due to an over consumption but as well, to other reasons such as surrounding area overheating. For Operational reasons (e.g. required flight information to be displayed by EFB), automatic reset could be justified as possible and safe when the overheating condition disappears.	Change the sentence as follows: “Automatic reset features, if any, should be justified as not impairing safety”.	Not Accepted. This policy is consistent with and already published as ANM-01-111-165, <i>Policy Statement on Certification of Power Supply Systems for Portable Electronic Devices on Part 25 Airplanes</i> . Keep in mind this is to support portable devices for which a safety assessment is not possible.
54.	AIRBUS	Page 6 / Para 5.d.(3)	Paragraph of the AC to which the comment relates: “Installed EFBs are multipurpose display devices	Equipment qualification can be part of the system certification	Installed EFBs are multipurpose display devices and can follow the design	Accepted. See comment #13,

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			<p>and should follow the design standards found in TSO-C113, <i>Airborne Multipurpose Electronic Displays</i>.”</p> <p>AI comment: TSO-C113 compliance should be done only if the applicant is seeking for a FAA TSO approval.</p>	<p>activities, regardless of any TSO approval.</p>	<p>standards found in TSO-C113, <i>Airborne Multipurpose Electronic Displays</i>, if such approval is sought.”</p>	
55.	AIRBUS	Page 6 / Para 5.d.(3)	<p>Paragraph of the AC to which the comment relates: “For part 25 airplanes, display characteristics listed in AC 25-11, <i>Electronic Flight Deck Displays</i>, are applicable”</p> <p>AI comment: this requirement is valid only for flight deck displays capable of displaying both certified data (non-EFB data) and non-certified EFB data (the meaning of “multipurpose display devices”).</p>	<p>AC 25-11 addresses only display systems used for guidance, control, or decision-making by the pilots, i.e. systems (such as Primary Flight Display) intended to display certified data computed by certified avionics systems as part of the aircraft type design. This is important when display systems may contribute to failure conditions classified as major or higher.AC 25-11 was not intended to address display of non-certified data</p>	<p>For part 25 airplanes, display characteristics listed in AC 25-11, <i>Electronic Flight Deck Displays</i>, are applicable when the display device is a common display device and not strictly limited to Type A and B EFB data display.</p>	<p>Not Accepted. AC 25-11 states explicitly in Table 1 that it is applicable to “Display aspects of Class III Electronic Flight Bag (installed equipment).”</p>

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				<p>which are only OPS-approved (i.e. from Type A and B software applications). AC 25-11 should not be applicable to a stand-alone EFB display limited to Type A and B Software applications display.</p>		
56.	AIRBUS	Page 6 / Para 5.e.	<p>Paragraph of the AC to which the comment relates: “Partitioning for an installed EFB should be done via hard-partitioning with physical separation between OSs, processors, etc.” AI comment: The overall objective is missing. Para 5.e should be reworded in accordance with :</p> <ul style="list-style-type: none"> - Para 5.e.(2) : “ ... to prevent the hosted Type A/B applications from having any adverse effects on the approved software and other aircraft systems” - Para 6.c.(2) : “If the 	<p>Airbus considers this requirement as too much design prescriptive. Airbus suggests that the AC stays objective-oriented and that the solution to meet the objectives be defined by the applicant.</p>	<p>Add the following sentence: “If the EFB hosts Type A/B applications, adequate partitioning must be provided to ensure the EFB Type A/B applications have no adverse effects on other certified applications”.</p> <p>Replace the term “should” by “may” in the following sentence : “Partitioning for an installed EFB may be done via hard-partitioning with</p>	<p>Partially Accepted. The theme of this comment has been implemented into paragraph 5.e, in parallel with suggestions from other comments. See comments 1-5.</p>

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			<p>EFB hosts Type A/B applications, adequate partitioning must be provided to ensure the EFB Type A/B applications have no adverse effects on those other Applications”</p> <p>All other considerations given in Para 5.e. should be suggested as examples only.</p>		<p>physical separation between OSs, processors, etc.”</p>	
57.	Garmin	General	<p>The entire concept of an EFB is confusing.</p>	<p>As Garmin noted in its comments on draft AC 120-76B, the entire concept of an EFB is confusing. There are no examples provided as to what constitutes a Class 1, Class 2, or Class 3 EFB and in the case of this AC, there are no examples provided as to what constitutes a portable EFB and an installed EFB.</p> <p>Along a similar line, there is no indication as to why previous</p>	<p>Given the significant issues that Garmin has identified in both draft AC 120-76B and AC 20-EFB, FAA should simultaneously make available a new draft of each of these documents for public comment prior to final publication of these ACs.</p>	<p>Acknowledged.</p> <p>This AC does not define Classes of EFBs. However, in this AC we have attempted to further refine what an EFB is by stating EFBs host software applications to provide “paper” to “electronic” flight bag functionality called Type A and B applications (see AC 120-76, appendices 1 and 2, for listing of example applications). What makes an EFB different from and MFD is that it must be capable of hosting Type A and B applications.</p>

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				<p>revisions of AC 120-76 have been applied to installed MFDs for applications like chart displays that are already subject to the rigorous airworthiness approval process. AC 20-EFB should either clarify that installed MFDs are out-of-scope or should clarify why installed MFDS are within scope while also clarifying which unique portions of AC 20-EFB are applicable to installed MFDs as there are several other FAA guidance documents that are applied to installed MFDs and some of the guidance within AC 20-EFB is redundant or in conflict with that guidance.</p>		
58.	Garmin	Page 1, ¶ 1.b	States:	The guidance in the AC body includes the	This AC should provide guidance	Accepted.

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			<p>This AC describes an acceptable means, but not the only means, to comply with Title 14 of the Code of Federal Regulations (14 CFR) part 23, 25, 27, or 29. This AC is not mandatory and does not constitute a regulation. However, if you use the means described in this AC, you must follow it entirely.</p>	<p>terms “must” and “should”; consequently it is unclear exactly what “means described in this AC” must be followed “entirely”.</p>	<p>regarding the terms “must” and “should” to make it clear what guidance must be followed entirely and what guidance is optional.</p> <p>For example, AC 20-172 paragraph 1-1.c includes the statements:</p> <p>The term “must” is used to indicate mandatory requirements when following the guidance in this AC. The terms “should” and “recommend” are used when following the guidance is recommended but not required to comply with this AC.</p>	
59.	Garmin	Page 1, ¶ 3	This paragraph defines the scope of the AC but provides no definition for what	It is important to define what constitutes an EFB	This AC should either: <ul style="list-style-type: none"> Clarify that 	Accepted. The application of this AC to an installed MFD seeking to

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			constitutes an EFB.	because FAA certification personnel have previously applied AC 120-76A to installed MFDs for applications like chart displays that are already subject to the rigorous airworthiness approval process.	<p>installed MFDs are out-of-scope or</p> <ul style="list-style-type: none"> • Clarify why installed MFDs are within scope while also clarifying which unique portions of this AC are applicable to installed MFDs as much of the guidance within this AC is redundant with or in conflict with other certification guidance to which installed MFDs are already subject. 	<p>use chart displays in lieu of paper is entirely appropriate for that intended function. As stated in para 5.e.(3). of this AC, “For example, provided the intended function has been evaluated specifically for replacement of paper products, software with an airworthiness approval performing an aeronautical charting application should require no further evaluation by the AEG to be authorized for use in an EFB.”</p> <p>Changed scope to read “This AC addresses installation of EFB components. In the context of this AC, EFB components are “installed” when they are incorporated into aircraft type design under 14 CFR part 21 or as a proper alteration under 14 CFR § 43.3. All other EFB components are considered “portable,” regardless of how often they are removed from the aircraft. Design of portable EFB components</p>

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						are outside the scope of this AC.”
60.	Garmin	Page 1, ¶ 3 and Page 1, ¶ 4 and generally throughout AC	<p>¶ 3 includes the statement:</p> <p style="padding-left: 40px;">Portable EFBs and EFB components are outside the scope of this AC.</p> <p>And ¶ 4 includes the statement:</p> <p style="padding-left: 40px;">Portable EFBs and EFB components are not subject to airworthiness regulations or limitations, and are not covered in this AC.</p>	<p>While it seems likely that the quoted AC 20-EFB statements apply to Class 1 EFBs as defined in draft AC 120-76B ¶ 4.d, it is not clear whether these statements apply equally to Class 2 EFBs since draft AC 120-76B ¶ 4.e defines Class 2 EFBs as “[t]ypically portable” with provisions “installed in accordance with applicable airworthiness regulations”.</p> <p>Further, it is unclear whether the AC 120-76B ¶ 4.e Class 2 EFB definition applies to portable GPS navigation devices that include chart displays and/or moving maps that are</p>	<p>Suggest that:</p> <ul style="list-style-type: none"> • AC 20-EFB should not use the generic term of “portable EFB” and instead use the AC 120-76B Class 1 and Class 2 EFB terms for portable devices • The applicability of AC 20-EFB should be limited to Class 3 EFBs or clarify what types of Class 2 equipment must comply while exempting portable GPS navigation equipment. • AC 120-76B ¶ 4.e should be changed so that it specifically excludes regulatory compliance for 	<p>Not Accepted.</p> <ol style="list-style-type: none"> 1. The FAA chose to use the terms “portable” and “installed” versus Class I/II and Class III for AC 20-EFB. The intent behind this choice in terminology is to emphasize equipment which is subject to certification (“installed”), and equipment which is not subject to certification (portable). 2. AC 20-EFB is applicable to all portions of an EFB system which are installed in the aircraft. The AC goes beyond the “Class III EFB”, and touches on many of the installed provisions that accommodate portable (Class I/II) EFBs, such as mounting, power connectivity, data connectivity, etc. 3. The FAA is evaluating updates to the AC 120-76() series guidance to align with the guidance in AC 20-EFB.

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				<p>brought into the cockpit as backup devices because it is so broad. These devices are typically “installed” in Part 23 aircraft using power provided through a cigarette lighter adapter and yoke mounting devices.</p> <p>Lastly, while the quoted statements indicate portable EFBs are not covered by this AC, there are repeated uses of the term “portable” throughout the AC including 5.a.(6), 5.a.(8)(b), 5.a.(8)(c), 5.b, 5.b.(4), 5.c, 5.g, and 6.c.(1). Consequently, it is unclear why there is any guidance in this AC that specifically addresses portable EFBs.</p>	<p>the provisions.</p>	<p>4. AC 120-76() does not specifically address operational approval of portable GPS navigation devices in Part 121/135 operations. Although, in general, the FAA will not approve many of the applications (airborne moving map with ownship position) on portable navigators for use in Part 121/135 operations.</p> <p>5. A portable device (e.g. EFB or GPS navigator) used in a Part 23 aircraft under part 91 operations which is connected to a cigarette lighter and attached to a yoke mount is a portable device versus an installed device. The portable device requires no certification. Permanent installation of the cigarette lighter would require installation approval. Temporarily attaching the yoke mount to the yoke does not require approval, but permanently affixing the</p>

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						mount to the yoke would require airworthiness approval.
61.	Garmin	Page 1, ¶ 4	Includes the phrase “EFBs may consist of portable or installed as multi-purpose devices”	Editorial	Suggest changing “portable or” to “portable devices or be”.	Accepted.
62.	Garmin	Page 1, ¶ 4	Includes the statement: Portable EFBs are considered portable electronic devices (PEDs).	This statement could cause confusion since PEDs are associated with the 14 CFR 91.21 PED regulation and the AC 91-21.1B guidance associated with it, which applies to devices used by passengers not flight crew.	Suggest removing this statement or clarifying that EFBs are not subject to the 14 CFR 91.21 PED regulation and associated AC 91-21.1B guidance.	Accepted. However, 14 CFR § 91.21 is <u>not</u> limited to passenger devices, but all PEDs including portable EFBs.
63.	Garmin	Page 1, ¶ 4.a	Discusses the applicability of “ EFB Operational Guidance Under 14 CFR Part 91, Subparts F ... ”	Most other operational approvals are limited to Part 91 subpart K (e.g., AC 90-100A, AC 90-105, AC 90-101A, etc.). Why is it necessary to expand the EFB operational approval to Part 91 subpart F?	Suggest changing “Subparts F and K” to “Subpart K” in the title and the following sentence and revising draft AC 120-76B to limit its operational approval aspects to Part 91 subpart K.	Accepted. Guidance is now recommended for Part 91 Subpart F.
64.	Garmin	Page 2, ¶ 4.c	This paragraph begins by stating:	Portable GPS navigation devices have been used for	Suggest that the AC provide examples that clarify what types of	Not Accepted. Portable GPS navigation devices are not “installed”

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			<p>Airworthiness regulations applicable to portable EFBs are limited to the provisions for their installed mounting (including all hardware used to secure the portable device); wiring (both power and data up to, but not including, the portable device); data interface/protection devices; installed ports for connection to aircraft power and data connection; installed wireless communications; and installed antennas.</p>	<p>situational awareness purposes without operational credit for over 15 years. These devices are a great safety enhancement to certified equipment although they obviously cannot be used as a primary means of navigation.</p> <p>These devices are typically “installed” in Part 23 aircraft using power provided through a cigarette lighter adapter and yoke mounting devices. The quoted text could be over interpreted as implying that there are airworthiness regulations that are applicable to such installations. Such over interpretation could have a chilling effect on the use of portable GPS navigation devices</p>	<p>“portable EFBs” installations are subject to its guidance and that the example portable GPS navigation device, which is *not* installed be specifically exempted from the guidance in this AC.</p>	<p>and do not receive or require installation approval. Installation approval is through change to type design or alteration only. Guidance in AC 20-EFB does not impact use of portable GPS navigators.</p> <p>Also changed 1st sentence of 5.b to read “This section applies to design considerations for installing dedicated power port and cabling provisions for portable EFB components.”</p>

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				and a consequent reduction in aviation safety.		
65.	Garmin	Page 2, ¶ 4.c	<p>This paragraph begins by stating:</p> <p style="padding-left: 40px;">Airworthiness regulations applicable to portable EFBs are limited to the provisions for their installed mounting (including all hardware used to secure the portable device); wiring (both power and data up to, but not including, the portable device); data interface/protection devices; installed ports for connection to aircraft power and data connection; installed wireless communications; and installed antennas.</p>	Yet for various aspects of the listed provisions (e.g., yoke mounts and clips, power, and data) it provides no specific regulatory references within the AC to substantiate this assertion. Without specific regulatory references for all aspects of the provision Part 23, 25, 27 and 29, this AC could be over interpreted as implying that there are airworthiness regulations when there are not. Such over interpretation could have a chilling effect on the use of portable EFB devices and a consequent reduction in aviation safety.	Suggest that this AC be similar to draft AC 20-CNTL, which includes specific regulatory references that support the installation guidance (see for example AC 20-CNTL ¶s 1-4.a, 2-2.c.(3), 2-2.f.(2), 2-2.h, 2-10.c.(1), 2-10.c.(7), 2-12.a, 3-8 and its subparagraphs, Appendix C).	<p>Not Accepted.</p> <p>For components requiring installation approval, all applicable airworthiness rules apply. For portable devices the airworthiness rules do not apply.</p> <p>Because of the variety of system design approaches available, in many instances AC 20-EFB references regulatory requirements in a general fashion versus calling out specific regulatory areas. The intent of this approach is to avoid overstating requirements and avoid placing undue burden on industry.</p>
66.	Garmin	Page 3-9,	Much of the guidance in ¶ 5	Even if the	Suggest that all	Acknowledged.

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		¶ 5 and ¶ 6 and their subparagraphs	and ¶ 6 and their subparagraphs is either duplicated or in conflict with what is specified in draft AC 120-76B.	conflicting guidance issue is addressed, the duplicated installation guidance could become disharmonized at some point in the future.	installation guidance be removed from AC 120-76B and included as appropriate within AC 20-EFB to eliminate the duplication and that AC 120-76B then reference AC 20-EFB.	The FAA is updating the AC 120-76() guidance to align with the guidance in AC 20-EFB.
67.	Garmin	Page 3, ¶ 5.a	Includes the statement: The design of the EFB display mounting devices must address applicable airworthiness regulations (e.g., flammability).	The quoted text includes the example of flammability as one of the regulations that must be addressed yet there is no specific reference to regulations or guidance on flammability.	Suggest removing the “(e.g., flammability)” phrase or changing it to an example that is addressed within the AC.	Accepted.
68.	Garmin	Page 3, ¶ 5.a.(2)	States: Adjustable mounting devices should be able to lock in position easily. When designing locking positions, accommodate a range of flight crewmember preferences and the expected range of users’ physical abilities	This guidance goes well beyond what is required by regulation for an EFB mount. This does not provide guidance on how to comply with existing regulation, but rather provides product design suggestions that are	Remove the quoted excerpt. If the sentence referencing the 25.789 requirement remains, suggest starting the sentence with “For Part 25 aircraft, mounting design ...”.	Partially Accepted. A caveat has been added to clarify that 14 CFR § 25.789 is only applicable to 14 CFR § 25 aircraft. The design recommendations in paragraph 5.a.(2) are design practices to consider in addition to compliance to the regulation.

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			(i.e., anthropometric constraints). Locking mechanisms should be of the low-wear type, which minimizes slippage after extended periods of normal use. Mounting design must address the 14 CFR § 25.789 requirements for the retention of items of mass for the expected load factors anticipated when in use.	not required by regulation. Additionally, ¶ 1.b indicates this AC is applicable to Part 23, 27, and 29 aircraft as well as Part 25. So, the text that indicates “[m]ounting design must address the 14 CFR § 25.789 requirements” is out of scope for those aircraft.		
69.	Garmin	Page 3, ¶ 5.a.(4)	States: If appropriate, provide a means to secure, lock, or stow the mount in a position out of the way of flight crewmember operations when not in use.	Given that the mount must comply with accessibility, locking, and crashworthiness, this paragraph is unnecessary. The mount cannot pose a hazard, whether or not it is in use. There should not be a requirement for stowage.	Remove paragraph.	Accepted.
70.	Garmin	Page 3, ¶ 5.a.(5)	Includes the statements: The cable should not hang loosely.	This paragraph should not attempt to speculate on cable length or routing requirements.	The appropriate guidance should simply be: Mount cabling	Partially Accepted. This guidance is consistent with part 25 Electrical Wiring Interface Systems (EWIS) guidance and is a

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			<p>And</p> <p>Cables too long or short could present an operational or safety hazard.</p>		<p>must not present an operational or safety hazard.</p>	<p>design consideration that uses a “should.” Changed sentence to read: “Cables too long or short must not present an operational or safety hazard.”</p>
71.	Garmin	Page 3, ¶ 5.a.(6) and Page 4, ¶ 5.a.(7)	<p>Respectively, these paragraphs begin with the statement:</p> <p>Yoke Mounts and Clips (as described in 14 CFR part 23).</p> <p>And</p> <p>Yoke Mounts and Clips (as described in 14 CFR parts 25, 27, and 29).</p>	<p>Is there a more specific part 23, 25, 27 and 29 reference? Searching the FARs, the word “yoke” does not even appear, so using the phrases “as described in 14 CFR part 23” and “as described in 14 CFR parts 25, 27, and 29” seems misleading since there is no description of yoke mounts and clips anywhere in the FARs.</p>	<p>Suggest that specific references be provided or remove these paragraphs as there does not appear to be a regulatory basis for the guidance.</p>	<p>Accepted. Consolidated paragraphs and changed 4th sentence to read: “In 14 CFR parts 25, 27, and 29 aircraft, yoke mounting of an EFB is not recommended and all of the yoke mounting components (e.g., mounts, brackets, clips, etc.) for the EFB must be incorporated into the aircraft type design.”</p>
72.	Garmin	Page 4, ¶ 5.a.(8)	<p>Restrictions on use of Velcro are unreasonable.</p>	<p>Velcro could conceivably be used to restrain an EFB from movement in the aft direction only. There are no high-G load restraint requirements in the aft direction, but still</p>	<p>Clarify that Velcro restrictions are required only when the Velcro mount is used to show compliance with structural regulations. Delete AFM requirement.</p>	<p>Partially Accepted. Changed last sentence of 5.a.(5) to read: “If using hook-and-loop fasteners for installed EFB mounts to ensure crashworthiness:” Also deleted AFM requirement.</p>

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				Velcro would be subject to these extreme requirements. Additionally, the requirement for AFM instruction on the use of Velcro is unnecessary. Use of Velcro is obvious.		
73.	Garmin	Pages 4-5, ¶ 5.b and its subparagraphs	Power outlet assumptions.	The assumption that all aircraft require a power outlet is problematic. Part 23 aircraft typically do not have power outlets and instead use cigarette lighter adapters.	Limit the applicability of the guidance in ¶ 5.b and its subparagraphs to only those installations that actually require the use of a power outlet.	Not Accepted. If an applicant needs to install a dedicated power provision, this is their guidance. Class 1 EFBs do not require this, but Class 2 EFBs may. Guidance in AC 20-EFB does not prevent 14 CFR § 91 operators from plugging a portable EFB or portable GPS navigator into a cigarette lighter.
74.	Garmin	Page 4, ¶ 5.b.(1)	Installed switch requirement is unnecessary.	This requirement is clearly intended for “normal” use, because it does not permit a circuit breaker to be used. ¶ 5.b indicates this guidance applies to	Suggest delete the switch requirement entirely or at least limiting it to those installations that actually require the use of a switched “power outlet” and	Accepted. Previously addressed in comments #9, 64, and 73.

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				<p>“power provisions for portable EFBs”. Portable EFBs have their own on/off switch on the unit, so it unclear why there is a need to provide a switch for “de-powering the power outlet”.</p> <p>Furthermore, portable devices in Part 23 aircraft are often powered via a cigarette lighter adapter. Why would there need to be an installed switch when all that is required is to pull the cigarette lighter adapter from the cigarette lighter or merely unplug the device from the power cable? Why is the FAA making this so complicated?</p>	the outlet is powered from a hot bus.	
75.	Garmin	Page 4, ¶ 5.b.(2)	Includes the statement: Include fault protection features for monitoring	This language is confusing. Is the intention that fault protection (i.e circuit	Clarify language.	Accepted. 1 st and 2 nd sentence changed to read: “An appropriate means of fault protection

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			the health of fault detection circuits.	breaker) be provided for the power outlet?		(e.g., circuit breaker) for the power port outlet circuit should be provided. Ensure the circuit protective device requirements under 14 CFR § XX.1357 are met for parts 23, 25, 27, and 29 to guard against inadvertent contact with live parts of the system.”
76.	Garmin	Page 5, ¶ 5.b.(3)	Power source requirements are overly restrictive.	If the power outlet circuit is appropriately protected, as required in paragraph (2), what is the hazard from powering it from a primary/essential bus?	Require that the power outlet have pullable-resettable circuit protection in paragraph (2). Delete paragraph (3).	Accepted. See comment #75.
77.	Garmin	Page 5, ¶ 5.b.(4)	Includes the statement: The labeling placard must be legible, easy to see, and as close as practicable to the electrical outlet. The labeling placard should not impose any limitations on the portable EFB itself, which is the operator’s	If a placard is required for outlet labeling, it should be noted that placard design and position must be approved by FAA as part of type design. The placard labeling requirement may be reasonable for air transport aircraft but typically	Remove requirement for outlet labeling.	Not Accepted. This guidance is already published as ANM-01-111-165, <i>Policy Statement on Certification of Power Supply Systems for Portable Electronic Devices on Part 25 Airplanes</i> . For part 23 aircraft the expected performance of the outlet is just as critical for lithium batteries. Changed 1 st

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			responsibility.	not for general aviation aircraft.		sentence to read: “Labeling of aircraft electrical outlets should be provided to identify the electrical characteristics (e.g., 28 VDC, 115 VAC, 60 or 400 Hz, etc.) in order to address equipment sensitivity to voltage, current, or frequency parameters and to provide awareness to the flightcrew or maintenance personnel, reducing the likelihood of connecting incompatible devices to the power source.”
78.	Garmin	Page 5, ¶ 5.c.(2)(b)	Includes the statement: The design must include a means to ensure that EFB operation, malfunction, or failure does not adversely affect other installed aircraft systems to which connection is made. Design interface protection devices enabling connection of EFBs to existing aircraft equipment, systems, data buses, or networks to address any potential	This does not provide guidance on how to comply with existing regulation, but rather provides product design suggestions that are not required by regulation. Additionally, it is not possible to “address <u>any</u> potential vulnerability ...”.	Suggest changing this to: Consideration should be given to protection of EFB connections to existing aircraft equipment, systems, data buses, or networks to address potential vulnerabilities and threats in terms of computer viruses, worms,	Partially Accepted. Changed “potential” to “likely” to deal with conceivable threats.

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			vulnerability and threats in terms of computer viruses, worms, unauthorized access, and malicious access.		unauthorized access, and malicious access.	
79.	Garmin	Page 6, ¶ 5.d.(3)	Includes the statement: For part 23 airplanes, apply all display characteristics listed in AC 23.1311-1, <i>Installation of Electronic Display in Part 23 Airplanes</i> .	It is unclear why the word “all” is used in the quoted statement since AC 23.1311-1 is not a regulation but rather an acceptable means. Furthermore, the preceding sentence that refers to AC 25-11 does not use the word “all”.	Suggest changing “all” to “the” in the quoted statement.	Accepted.
80.	Garmin	Page 6, ¶ 5.e.(1)	Includes the statement: This configuration would usually identify the hardware installed as miscellaneous, nonrequired equipment.	Use of the term “configuration” in this sentence is not clear.	Suggest changing the statement to: Such equipment usually would be installed as miscellaneous, nonrequired equipment.	Accepted.
81.	Garmin	Page 6, ¶ 5.e.(1)	Includes the statements: The host environment OS and Type A/B applications are not installed, and may be loaded by the	It is unclear how software “are not installed” when the hardware is installed. This seems inconsistent with FAA policy for	Suggest changing the statements to: The host environment OS and Type A/B applications are	Partially Accepted. The term “installed” is used regularly to describe the process of loading software to a computer. However, in the aircraft certification sense and the sense that is used in

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			<p>manufacturer or operator.</p> <p>Note: ... As described in AC 20-159, the AMMD application is designed to reside with the Type A/B applications found in the EFB and does not have to be installed.</p>	<p>MFDs.</p> <p>Furthermore, it is not entirely clear what is meant by the term “installed”.</p>	<p>approved for installation, and may be loaded by the manufacturer or operator with appropriate instructions.</p> <p>Note: ... As described in AC 20-159, the AMMD application is designed to reside with the Type A/B applications found in the EFB.</p>	<p>this AC, the term “installed” is used to imply that the software is “loaded” to the aircraft as a change to type design, or as an alteration.</p> <p>The FAA allows Type A and B EFB applications to be loaded to both portable and installed EFBs without a change to the type design or as an alteration.</p> <p>See comment #15.</p>
82.	Garmin	Page 6, ¶ 5.e.(3)	<p>Includes the statement:</p> <p>Historically, operators have chosen to utilize EFB Type A/B applications which were not installed, to reduce certification costs.</p>	<p>This statement confuses “approval” with “installation”.</p>	<p>Suggest changing the statement to:</p> <p>Historically, operators have chosen to utilize EFB Type A/B applications which were not approved as type design, to reduce certification costs.</p>	<p>Accepted.</p> <p>The statement was updated as follows:</p> <p>“Historically, operators have chosen to utilize EFB Type A/B applications on portable EFBs.”</p>
83.	Garmin	Page 6, ¶ 5.e.(3)	<p>Includes the statement:</p> <p>For example, software</p>	<p>It is unclear what this statement is trying to convey and appears</p>	<p>Clarify the intent of the statement limiting its purpose to</p>	<p>Not Accepted.</p> <p>This sentence highlights that if originally evaluated for the</p>

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			with an airworthiness approval performing an aeronautical charting application could be utilized to support operational requirements without further operational evaluation for use provided the intended function has been evaluated for replacement of paper products.	to confuse operational approval aspects with installation approval aspects.	installation approval aspects.	removal of paper products, charting applications need no further operational evaluation.
84.	Garmin	Page 7, ¶ 6.a	Includes the statement: For devices which are intended for non-EFB applications, develop the airborne electronic hardware using AC 20-152, <i>RTCA, Inc., Document RTCA/DO-254, Design Assurance Guidance for Airborne Electronic Hardware</i> , for EFB hardware provisions being installed which include complex custom airborne electronic hardware components.	It is unclear why installed EFB devices which are intended only for EFB applications are exempt from this guidance. Given that ¶ 3 and ¶ 4 of this AC include statements that indicate portable EFBs are out of scope, and that consequently the guidance in ¶ 6.a should be applied only to installed EFBs, the initial qualifying phrase “For devices which	Suggest revising the statement as follows: <i>AC 20-152, RTCA, Inc., Document RTCA/DO-254, Design Assurance Guidance for Airborne Electronic Hardware</i> , provides an acceptable method for demonstrating the design assurance of complex custom micro-	Partially Accepted. The title of <i>RTCA/DO-254</i> is “ <i>Design Assurance Guidance for Airborne Electronic Hardware</i> ” and it is our accepted means of developing AEH per AC 20-152. 1. Type A&B applications by definition have either a minor or no safety effect. The FAA does not require use of DO-254 in this instance for avionics, including TSO’d avionics. This provision is carried forward to EFBs. When the EFB contains applications

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				<p>are intended for non-EFB applications” seems inappropriate.</p> <p>Additionally, AC 20-152 does not use the term “airborne electronic hardware”. Use of this term is problematic for the following reasons:</p> <ul style="list-style-type: none"> • The “airborne electronic hardware” term appears to imply that DO-254 should be applied to the entire EFB’s electronic hardware rather than only the “complex custom micro-coded components” that AC 20-152 refers to. <p>The “airborne electronic hardware” term was introduced in FAA Order 8110.105. FAA Orders are not</p>	<p>coded components included in installed EFB hardware is appropriate for its intended function.</p>	<p>with a major failure effect, DO-254 is applicable.</p> <p>2. The word “installed” has been added at the beginning of the sentence to clarify that DO-254 is only applicable to installed versus portable EFBs.</p> <p>3. Use of DO-254 applies to complex custom airborne electronic hardware when the failure condition classification of the equipment is major or greater. The language in AC 20-EFB has been updated accordingly to be consistent.</p>

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				<p>methods of compliance for industry to utilize but rather they are requirements for FAA personnel to follow when determining compliance to regulations. Applicants are legally obligated to comply with regulations and directives, while policy can provide clarification of regulation and guidance can provide acceptable methods of compliance. Applicants are not obligated to follow orders nor are FAA orders written for applicants.</p>		
85.	Garmin	Page 7-8, ¶ 6.a	<p>Includes the statements:</p> <p style="padding-left: 40px;">This guidance is applicable if the component's failure condition classification is major or higher. For</p>	<p>Use of the term "component's" and "components" in these sentences could be confusing as it could refer to the "EFB components"</p>	<p>Suggest revising the statements as follows:</p> <p style="padding-left: 40px;">This guidance is applicable if the complex custom micro-coded</p>	<p>Accepted. Paragraph 6.a. has been revised to clarify that complex custom AEH must be developed in accordance with DO-254 when the failure condition</p>

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			<p>components with failure classification of minor, an existing design assurance practice may be used.</p>	<p>definition in paragraph 4.d of this AC or “complex custom micro-coded components” as defined in AC 20-152.</p>	<p>component’s failure condition classification is major or higher. For complex custom micro-coded components with failure classification of minor, an existing design assurance practice may be used.</p>	<p>classification of the equipment is major or higher: See revised text below:</p> <p>“For installed EFB components including complex custom AEH, if the failure condition classification is major or greater, develop the complex custom AEH using AC 20-152, <i>RTCA, Inc., Document RTCA/DO-254, Design Assurance Guidance for Airborne Electronic Hardware</i>, to the design assurance level consistent with the failure condition classification. If the failure condition classification is minor, or no effect, an existing design assurance practice may be used to develop the complex custom AEH.”</p>
86.	Garmin	Page 8, ¶ 6.a.(1)	<p>Includes the statement:</p> <p>Ensure the environmental qualification of installed EFB components is appropriate using AC 21-16, <i>RTCA/DO-160</i></p>	<p>As written the statement implies that AC 21-16 and RTCA/DO-160[] are the only means to ensure environmental qualification of</p>	<p>Suggest revising the statement as follows:</p> <p>Ensure the environmental qualification of installed EFB</p>	<p>Accepted.</p>

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			<p><i>Versions D, E, F, and G, "Environmental Conditions and Test Procedures for Airborne Equipment,"</i> to demonstrate equipment performance in environmental conditions encountered during operation of the equipment in aircraft.</p>	<p>installed EFB components. EFB components as defined in paragraph 4.d of this AC include items that are not typically environmentally qualified via RTCA/DO-160[]. Further, AC 21-16 and RTCA/DO-160[] are not regulations. AC 21-16 and RTCA/DO-160[] is one acceptable means of demonstrating environmental qualification to meet regulations.</p>	<p>components as required by the installation. AC 21-16, <i>RTCA/DO-160 Versions D, E, F, and G, "Environmental Conditions and Test Procedures for Airborne Equipment,"</i> provides an acceptable method to demonstrate equipment performance in environmental conditions encountered during operation of the EFB components in aircraft.</p>	
87.	Garmin	Page 8, ¶ 6.a.(3)	Reference to AC 20-158 is missing a hyphen.	Editorial	Change "AC 20 158" to "AC 20-158"	Accepted.
88.	Garmin	Page 8, ¶ 6.b	<p>Begins with the statement:</p> <p>Develop approved software using AC 20-115, <i>RTCA, Inc., Document RTCA/DO-</i></p>	As written the statement implies that AC 20-115 and RTCA/DO-178B are the only means to develop approved	<p>Suggest revising the statement as follows:</p> <p>AC 20-115, <i>RTCA, Inc., Document</i></p>	Partially Accepted. Added AC 20-171 as alternative means guidance for DO-178B.

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			<i>178B.</i>	software. AC 20-115 and RTCA/DO-178B are not regulations. AC 20-115 and RTCA/DO-178B is one acceptable means of approving software to meet 2x.1301/2x.1309 regulations.	<i>RTCA/DO-178B</i> , provides an acceptable method for demonstrating the design assurance of software included in an installed EFB hardware is appropriate for its intended function.	
89.	Garmin	Page 8, ¶ 6.c.(1)	States: The use of Type A and B applications in portable devices, when accomplished in accordance with AC 91-78 or AC 120-76, as applicable, has been found to provide an acceptable level of safety.	Given that ¶ 3 and ¶ 4 of this AC include statements that indicate portable EFBs are out of scope, the guidance in ¶ 6.c.(1) seems inappropriate.	Suggest deleting ¶ 6.c.(1) or at most relegating it to an informational Note.	Accepted. Changed to read: “Typically, the failure condition classification of Type A/B applications, as defined in AC 120-76, is considered to be minor or no effect. AC 120-76 provides allowances for use of these applications on EFBs based on an equivalent level of safety to the paper reference material or operational process. When the Type A/B application is installed as part of aircraft type design or as an alteration, you may consider malfunction of the Type A/B application to be a minor failure condition

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						classification and loss of the Type A/B application to have no safety effect, or you may accomplish a system safety assessment to determine the appropriate failure condition classification.“
90.	Garmin	Page 8, ¶ 6.c.(2)	<p>Includes the statement:</p> <p>We recommend the use of ARP 4754A, <i>Guidelines for Development of Civil Aircraft and Systems</i>, and ARP 4761, <i>Guidelines and Methods for Conducting the Safety Assessment Process on Civil Airborne Systems and Equipment</i>, when developing a partitioned installed EFB system and showing compliance with airworthiness regulations.</p>	<p>FAA has published draft AC 20-SYSTMS that recognizes SAE ARP 4754A. Just as ¶ 5.f of this AC recommends use of AC 20-CNTL and expects to correct the reference to the actual published AC number prior to publication of AC 20-EFB, it seems like it would be better to reference AC 20-SYSTMS here. Additionally, referencing AC 20-SYSTMS here would be consistent with the other design assurance guidance references within this AC; specifically:</p>	<p>Suggest revising the statement as follows:</p> <p>We recommend the use of AC 20-SYSTMS, <i>Development of Civil Aircraft and Systems [will be corrected prior to publication]</i>, when developing a partitioned installed EFB system and showing compliance with airworthiness regulations.</p>	<p>Acknowledged. We did not reference AC 20-SYSTMS because we were unsure if it would publish prior to AC 20-EFB. Pointing to and recommending use of the ARPs is an acceptable alternative at this time.</p>

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				<ul style="list-style-type: none"> ¶ 6.a reference to AC 20-152 for complex custom micro coded components ¶ 6.b reference to AC 20-115 for software 		
91.	Garmin	Page 9, ¶ 7.a	This list should also include AC 20-SYSTMS.	See Garmin comment on ¶ 6.c.(2).	Add: <i>AC 20-SYSTMS, Development of Civil Aircraft and Systems [will be corrected prior to publication]</i> To the list of referenced FAA ACs.	Acknowledged. We did not reference AC 20-SYSTMS because we were unsure if it would publish prior to AC 20-EFB. Pointing to and recommending use of the ARPs is an acceptable alternative at this time.
92.	Cessna Aircraft Company	5.b(2) Fault Protection	Cessna requests clarification, and feels that this is not nearly specific enough. Cessna is concerned of exactly what faults are referred to here: Wire faults? Internal EFB battery faults? Out of tolerance voltage or current?			Accepted. See previously accepted comment #75.
93.	Cessna Aircraft Company	5.b(1) Installed Switch	Cessna requests clarification: Is the intent that this be a dedicated switch for the EFB outlet only? Or is a general			Accepted. A means to de-power the EFB is acceptable, as long as it is properly designed and

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			means to depower the outlet acceptable (such as a non-essential bus master switch)?			airworthy. Changed to read: "A means, reachable by the pilot seated at the controls, should be provided for de-powering the EFB or power port (e.g., access to unplug the EFB, or a separate switch clearly labeled for the power port)."
94.	Hank Cabler, AFS-430	Para 5.a.(8)	"VELCRO": VELCRO® is a registered trademark of Velcro Industries B. V. It is commonly, but improperly, used as the generic term for all hook-and-loop fasteners. When the use of hook-and-loop fasteners is proposed, we should refer to the specific hook-and-loop fasteners, such as the Scotchmate Recloseable Fasteners SJ3519FR (hook) and SJ3518 (loop). If we are referring to those types of fasteners generically, we should use the phrase "hook-and-loop" fasteners.			Accepted.
95.	Jeff Pierson, Certification PA-47 Engineering	Para 5.a.(8)	It is more polite, and generally more legal, to refer to Velcro in such documents as "hook and loop fasteners,			Accepted.

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96.	Mike Palmer. TCCA	4.d	such as Velcro®.” “EFB components may be portable or installed as part of aircraft type design. ... Figure 1 displays the typical EFB system components addressed by the guidance in this AC.”	(1) Figure 1 lists seven components (controls, mounts, processors, software, data interface devices, displays and power supplies), but does not mention memory or data storage. Is it acceptable to install memory and data storage devices that connect to portable EFBs? The memory would not need a data interface device as the data is for the sole use of the portable EFB applications. (2) Figure 1 does not include a printer among the seven EFB system components. A printer could be dedicated for use by a portable EFB, or its use could be shared between the portable EFB and other aircraft systems.		Accepted. Changed 5.c, 3 rd sentence to read: “All EFBs using data connectivity provisions to aircraft systems must incorporate an interface protection device (e.g., physical partitioning or read-only access) to ensure data connection required by the device, and its software applications, have no adverse effects on other aircraft systems, including installed data servers, data storage devices, and memory” and 5.c.(2).(b). 2 nd sentence to read: “Design interface protection devices enabling connection of EFBs to existing aircraft equipment, systems, memory, data storage, data buses, or networks to address any likely vulnerability and threats in terms of computer viruses, worms, unauthorized access, and malicious access.” An installed printer would need to be evaluated based

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				Section 6 does not discuss considerations for the design assurance level of installed components (either EFB components or aircraft components) that connect to a portable EFB.		on intended function.
97.	Mike Palmer. TCCA	5.c	<p>“EFBs having data connectivity to aircraft systems; either wired or wireless, may read or <u>transmit data to</u> and from aircraft systems, provided the connection and interface protection device is defined as part of the aircraft type design.”</p> <p>Permitting aircraft systems (other than the Data Interface Device) to receive signals from portable equipment is a departure from Transport Canada guidance, which says that the operation of the EFB must not affect installed equipment. [Transport Canada Policy Letter 500-017 section 5.4 d, “The power and data connections</p>			<p>Accepted. Partition and non-interference are sufficient to protect aircraft systems and must be proven. This should be consistent with TCCA policy.</p>

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			<p>shall be protected such that no operation or failure of the EFB shall affect other installed equipment.”] In permitting aircraft systems to receive EFB application data, the AC should provide design guidance and possibly procedures for certification of designs that receive data from portable equipment. One task that deserves consideration is crew entry of the results of an EFB application into an aircraft system. The accuracy of manual transcription of numbers from the EFB can be improved by transmitting limited data to the Data Interface Device (which is an installed and approved aircraft system). The manual entry of an EFB application into the Data Interface Device may be acceptable validation for some EFB data, but the possibility of transcription error remains. To address transcription error, the Data Interface Device can compare the</p>			

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			<p>numbers entered by the crew with the data received electronically from the EFB application. In addition, the Data Interface Device can check EFB application data using approved criteria (e.g. range limits and large difference from previous entry). Finally, the Data Interface Device can transmit data for display in a format that enables the crew to easily determine the consistency of the EFB application data, and once this consistency is confirmed, the Data Interface Device can distribute the EFB application data to aircraft systems. The AC may expand on the above functions of the Data Interface Device.</p> <p>Any guidance for receiving data from EFB applications should emphasize the role of the crew in validating the data before it leaves the installed Data Interface Device. This concept is reflected in the above</p>			

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			paragraph, which presents the Data Interface Device as the design element where Aircraft Certification and the Applicant work out the parameters to be used by the aircraft systems.			
98.	Mike Palmer. TCCA	5.c.(2)(c)	<p>“Provide plans for verifying and maintaining the security protection mechanisms and functionality to adequately address each threat.”</p> <p>Are these plans to be provided to the ACO or the installer? Are the ICAs the proper place to document the means to maintain and verify protection mechanisms are in place? What regulation requires the periodic maintenance and verification when there is no operating certificate?</p>			<p>Acknowledged.</p> <p>There is not yet an established standard for system security at the box installation level. Therefore, as of this publication there is a need for a case-by-case approach.</p>
99.	Mike Palmer. TCCA	5.e	<p>This section addresses the processing and partitioning of individually installed components. It took me a while to realize that these 'processing and partitioning' requirements could apply to more than just an installed EFB processor running</p>			<p>Acknowledged.</p> <p>Data protection or partition applies to the EFB system as a whole.</p> <p>Without any established standard for lithium batteries of this size, there is no mature policy to cite at this</p>

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			<p>applications. They apply equally to the Data Interface Device, which may not host an EFB application. Perhaps this point could be made clear in Figure 1? The change could be as subtle as adding 'see paragraph 5.e where applicable' for Data Interface Device.</p> <p>Section 5.g: This section on lithium-ion batteries would benefit from a reference to design guidance for lithium battery installation, or perhaps to the manufacturer's website for precautions regarding use and charging?</p>			<p>time other than DO-311 for larger batteries.</p>
100.	Mike Palmer. TCCA	5.3.(4)	<p>EFBs Hosting Only Approved Software. EFBs must be able to host flight bag applications, regardless of whether those applications are approved software or not. Installed equipment without the ability to host flight bag applications is not an EFB and specific guidance is not included in this AC.” This is a very important concept. You might consider alternate text,</p>			<p>Accepted. The paragraph has been deleted.</p>

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			"Installed processors must be shown to have the ability to host EFB applications to be identified as EFBs in the approved type design."			
101.	Mike Palmer. TCCA	6	Consider a new heading that would discuss the need to document procedures and limitations to be observed when installing the portable components and when loading EFB applications into an installed EFB component.			<p>Not Accepted. Portable equipment, as defined in this AC, will not be installed.</p> <p>Loading EFB Type A and B applications is not considered an alteration or change in type design, and thus is out of scope for this AC.</p>
102.	RLENTZ	1a & 3	Paragraph 1A attempts to define EFB "Components" and states that components are a part of the purpose of this AC. However, Paragraph 3 then goes on to say that EFB "Components" are out of scope which in itself does not make sense for the AC.	Conflict Inconsistency	Remove "and EFB components" from Paragraph 3.	<p>Partially Accepted. Para 3 has been updated for clarity.</p>
103.	RLENTZ	4	Similar comment as 1. In addition, portable EFB components such as the EFB mounting for Class 2 "portable" devices do fall under airworthiness regulations, and EFB	Conflict Inconsistency	Remove "and EFB components" from Paragraph 4.	<p>Accepted. Para 4 has been updated for clarity.</p>

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			mounting falls under the definition of EFB “Components”.			
104.	RLENTZ	4a	How can “non-EFB” applications be hosted on an “EFB”? This does not make sense. It also implies that EFBs cannot host a Type C application which is fine with me but I am not certain that is the intent.	Lack of clarity		Acknowledged. Non-EFB applications were previously named Type C. Type A and B applications are EFB applications. There is no difference between Type C and other approved software. We refer to Type C applications as approved software in this AC to be consistent with aircraft certification practices.
105.	RLENTZ	5.d.3	Why are installed EFB displays considered “multipurpose display devices”, if they are dedicated to the use of the EFB and therefore no difference than a Class 1 or Class 2 display.	Clarification		Acknowledged. The difference between an EFB and a MPD is that an EFB is designed to host Type A and B software applications. The purpose of 5.d.(3) is to recommend the industry consensus display design standard for EFBs.
106.	RLENTZ	5.g	There is no statement of regulation on use of rechargeable Lithium batteries in Installed EFBs. Only Portable EFBs which are not in the scope of this AC. The remainder of the paragraph is purely technical			Partially Accepted. A change to clearly state that lithium batteries must meet airworthiness requirements was added, however until a standard is produced by SC-225, there is no viable standard to apply toward

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			comment.			EFB sized batteries other than what applies to all installed systems. See previous comment #16.