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Airbus

FlySmart with Airbus for iPad

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1. Purpose and Applicability: This OSR addresses the FlySmart with Airbus for iPad and Apple iPad tablet computer, software/hardware combination, as may be applied for the Airbus A320 family, A330, A340, and A380 aircraft.

Special Ops Evaluators from the European Aviation Safety Agency (EASA) and Operations Aviation Safety Inspectors from the Federal Aviation Administration (FAA), Seattle Aircraft Evaluation Group (SEA AEG), as an Operational Evaluation Board (OEB), jointly performed operational suitability assessment of the software/hardware combination in accordance with Acceptable Means of Compliance (AMC) 20-25 (Comment-Response Document (CRD) Version), and Advisory Circular (AC) 120-76C, Guidelines for the Certification, Airworthiness, and Operational Use of Electronic Flight Bags (EFB).

Provisions of this report are consistent with the guidance defined in AC 120-76C and FAA Order 8900.1, Flight Standards Information Management System. The OEB evaluation found that the FlySmart with Airbus for iPad software suite meets the requirements defined in this guidance.

This report does not approve operational use of the tablet or applications. Aircraft operators must apply to their assigned operations authority for applicable operational authorizations. Information in this report may be used as a resource for obtaining operational approval.

Provisions of this report are effective until amended, superseded, or withdrawn.

2. EFB Make and Model: The FlySmart with Airbus for iPad software suite is developed for use with commercial-off-the-shelf (COTS) Apple iPad models. These portable electronic device tablet computers may be classified as either Class 1 “portable” or Class 2 “portable” EFB hardware. Refer to Section 12 of this report for more information on the Apple iPad models validated for use as a portable EFB with the FlySmart with Airbus for iPad software suite.

3. Software Applications: FlySmart with Airbus for iPad is classified as a Type B software application and includes the following:

- Operational Library Browser (OLB) application that displays operational manuals (FCOM, MEL, CDL),
- Takeoff performance module (T.O. PERF),
- Landing performance module (LDG PERF),
- Loadsheet performance module (LOADSHEET)..

Available navigational chart applications are produced, obtained, and utilized separate from the FlySmart with Airbus for iPad software suite and are have not been considered in this report.

4. EFB Mounting Device: This report does not include evaluations of any iPad mounting device as would be typical for a Class 2 EFB. If the EFB is to be used as a Class 2 portable device, it is the responsibility of the user/operator to obtain airworthiness installation approval

and operational authorization from their assigned operations authority for the mounting device, as well as the means for stowing, locking, and securing the device when not in use and for takeoff and landing.

If the portable COTS device is to be used as a Class 1 portable EFB, which typically utilizes a temporary securing solution, it is the responsibility of the user/operator to obtain operational authorization from their assigned operations authority for a means of stowing, locking, and securing the device when not in use and for takeoff and landing.

5. Display Lighting and Reflectivity: The displays for the Apple iPad models identified in this report, have been evaluated in most all applicable lighting conditions. Each model is equipped with appropriate dimming/brightening capability and is readable under a full range of lighting conditions.

The hardware controls of the iPad are not illuminated, but given their very limited number and obvious placement, this is considered acceptable.

There is no color wash-out at large viewing angles.

The legibility under the full range of lighting conditions expected on the operator's flight deck, including use in direct sunlight, remain to be evaluated by each operator.

6. Suitability of EFB Procedures for all Phases of Flight: It is recommended that EFB use be minimized during critical phases of flight.

The EFB must be properly stowed and/or secured for takeoff, final approach, and landing.

Normal and supplemental operating procedures must be included in the applicable airplane operations manual, flight deck checklist(s), and briefing guides.

There are no Non-Normal or Emergency procedures associated with the EFB, per se. There are some specific user modifiable entries that a flight crew may make that pertain to performance calculations for approach and landing scenarios involving inoperative equipment and certain failure cases.

7. Suitability of Procedures with EFB Failures: Two or more operational EFBs containing Type B software applications for in-flight use are required. Airbus may provide recommended operational mitigation means for single failure cases of certain FlySmart with Airbus for iPad applications or the failure of an iPad tablet computer. For dual failures of applications or tablet computers, alternate procedures or backup systems must be established. It is the responsibility of the user/operator to establish operational procedures for single and dual EFB failures.

8. Revision Process: Flight crews must be made aware of the applicable revision status. Procedures should include the verification of the applicable software and database load. User/operators are responsible for the development of procedures that ensure that flight crews are aware of the EFB Version, as displayed on the My Flight page, as being the latest most up to date version and to establish adequate administrative procedures for maintaining updated versions.

9. Specifications for Training: For EFB initial, transition, or currency (e.g. recurrent) training, pilots must be trained to proficiency in the use and operation of the FlySmart with Airbus for iPad applications using a minimum of Level B (refer to Table 1) aided instruction as defined in AC 120-53, Guidance for Conduction and Use of Flight Standardization Board Evaluations.

Training programs for the EFB may take credit for previous EFB experience. For example, previous experience using Class 1 or 2 applications having similar software may be credited toward EFB training. Principal Inspectors for operators initially introducing a new EFB system may approve programs consistent with programs previously approved for other operators.

	Training	Checking	Currency
FlySmart with Airbus for iPad	B	B	B

Table 1

9.1 Training Areas of Emphasis: In addition to the areas provided in AC 120-76 and Order 8900.1, it is recommended that the initial training include, but not limit to, the following areas of emphasis:

9.1.1 General:

- Hardware-related aspects e.g. use of the EFB hardware, the need for proper adjustment of lighting when the system is used in-flight, hardware environmental limitations, and management of the EFB battery and its charge.
- Basic common philosophy of the EFB applications, color coding, default values.
- Importance of executing all calculations in accordance with the standard operating procedures, to assure fully independent calculations, and to perform necessary cross-error and gross-error checks.
- Stress that care should be taken while performing calculations and that upon distraction or interruption during the input sequence, it should be considered to start from the beginning again.

- The importance of using and updating the “My Flight” page for each flight. This allows in particular insurance of a fresh start for each computation.
- Responsibilities and requirements regarding the installation and use of non-EFB applications.
- Toggling between the various EFB and non-EFB applications as well as exiting applications in the taskbar.

9.1.2 Loadsheets:

- Workflow in the loadsheet application and use of the different entry modes.
- Retention of the loadsheet data and transfer to performance applications.

9.1.3 Performance Applications:

- Training on the use of the Runway Condition Assessment Matrix (RCAM) and associated runway states as well as reported braking actions.
- Use and differences between the various “clear” functions.
- Differences between dispatch and in-flight landing calculations and conditions of use of each mode.
- Depending on an operator’s customization, content of engine out performance areas and detailed results pages.
- Use of take-off flaps optimization and relative company policies. If necessary crews should be trained on the behavior of the aircraft in new or different take-off configurations that may emerge due to the flaps optimization.

9.1.4 Ops Library Browser (OLB):

- The philosophy of the application should be understood, in particular the navigation inside documents and between different documents.
- Use of bookmarks (temporary or permanent) and selection of the level of detail.
- The OLB may not be suitable as a means to study a particular document compared to, for instance, a .pdf document. This is due to the structured approach requiring selection of chapters individually without continuous scrolling in the document.

9.1.5 MEL/CDL Items:

- Importance of, in case of open MEL/CDL items, the checking of associated provisos and restrictions.
- MEL/CDL items that have impacts on performance and have their effect fully taken into account by the performance applications.
- OLB as the preferred method for managing MEL/CDL items. Inserting items directly in the performance applications should be reserved to studying particular cases. Crews should be aware that an MEL/CDL item entered in one of the performance applications (e.g. Takeoff) is not shared with the other (e.g. Landing).

10. Specifications for Checking and Currency: For FlySmart with Airbus for iPad initial, transition, or currency (e.g. recurrent) checking, pilots must demonstrate proficiency in the use and operation of the FlySmart with Airbus for iPad applications as it pertains to the user/operator's procedures. This checking and currency must be conducted at a minimum of Level B (refer to Table 1), as defined in AC 120-53. Proficiency checking should be to demonstrate the use of FlySmart with Airbus for iPad. Demonstration of proficiency should be completed through tasks incorporated into a user/operator's training, checking, and currency curricula.

11. Crew Workload: A crew workload evaluation would be considered out of the scope of this document since it would be dependent on operator specificities, other EFB applications used, positioning of the device, and standard operating procedures.

12. EFB Hardware Considerations:

At the time of the evaluation, Airbus has submitted hardware compliance demonstration data for the following iPad models:

Model A1458	
Operating system :	Apple iOS 6
Display :	9.7 " (2048 x 1536)
Flash memory :	32GB
Processor :	Dual-core A6X
Power supply :	Charging via power adapter (10W) or USB to computer system via "lightning" connector cable
Battery :	Lithium-polymer
Weight :	652g

Model A1395	
Operating system :	Apple iOS
Display :	9.7 " (768 x 1024)
Graphic controller :	Intel® Integrated HD Graphics
Processor :	Samsung Apple A5 32bit
Power supply :	Charging via power adapter (10W) or USB to computer system via 30-pin "Dock Connector to USB" Cable
Battery :	Lithium-ion polymer
Weight :	600g

Model A1430	
Operating system :	Apple iOS
Display :	9.7 " (2048 x 1536)
Flash memory :	32GB
Processor :	ARM Apple A5X
Power supply :	Charging via power adapter (10W) or USB to computer system via 30-pin "Dock Connector to USB" Cable
Battery :	Lithium-ion polymer
Weight :	652g

After the evaluation, Airbus may propose additional hardware compliance demonstration data for additional iPad models.

Further iPad information on these and additional models may be obtained from the following Apple website: <http://support.apple.com/en-us/HT201471>

Aircraft operators may also directly propose hardware compliance demonstration data for new iPad models in compliance with the AC 120-76.

12.1 Electromagnetic Interference (EMI) Demonstrations (AC 120-76, 12.f.(2)(a) Method 1, Step 1): Radio Frequency (RF) emissions tests have been performed on the hardware models in accordance with and has shown compliance with DO-160F, Environmental Conditions and Test Procedures for Airborne Equipment, Section 21 Category M.

The tests have been performed under internal battery power, and with the iPad AC/DC adapter. Only the configurations where the EFB is charged through the apple charger have been evaluated. In case the iPad is charged through the USB port of a laptop, operators remain responsible to ensure the compliance of this whole system, including the radiated and conducted emissions of the laptop and its bundles.

The tests have been performed with Wifi and Bluetooth activated but not paired to any other

device or network, however this does not imply compliance with T-PED non-interference testing. In the frame of this evaluation, the Wifi, Bluetooth, and 3G functions are considered inhibited during operations (taxiing and flight).

Method 1, Step 1 tests results: No emissions were observed that exceed required limits.

12.2 Battery: Airbus provided the battery certificates and statement of conformity for the three hardware models.

The operator is responsible for the maintenance of the EFB system batteries and should ensure that they are periodically checked and replaced as required.

12.2.1 iPad Battery Safety Certifications: The Apple website, <http://support.apple.com/kb/HT5423>, states battery safety certifications for the advanced lithium polymer as installed on the iPad tablet computer. Figure 1 depicts these certifications as was last modified on December 9, 2013.

iPad: Battery safety certifications

Languages

[Learn about battery safety certifications for iPad.](#)

iPad features an advanced lithium polymer battery that provides up to ten hours of use*. In addition to providing hours of use, the iPad battery has been designed to meet international safety certification standards. All iPad batteries are tested, certified, and in compliance with the standards listed below. These standards meet the safety and testing criteria set forth in the FAA Advisory Circular AC 120-76B regarding the airworthiness and use of portable electronic flight bags.

- United Nations (UN) Transport Regulations UN38.3: Covers battery safety during air transport.
- Underwriters Laboratory (UL) 2054: Covers safety of lithium-ion batteries in general use; UL 60950-1 covers the use of batteries in information technology equipment.
- Institute of Electrical and Electronics Engineers (IEEE) 1725: Covers safety of lithium-ion battery packs in general use.

* Battery life varies by [use and configuration](#).

Last Modified: Dec 9, 2013

Figure 1.

12.3 Power Source: The iPad uses power from its internal battery, as well as from its AC/DC power adapter. Provided the power adapter is available and used, the need for a backup power source is therefore considered satisfied.

The power adapter must be used with the cockpit electrical outlets (115V/60 Hz) designed for connection with PEDs. In order to remain in line with the hardware compliance demonstrations,

operators need to use the charger type used during testing (original Apple charger).

12.4 Environmental Testing: The review of the testing results provided by Airbus indicates that the three hardware models meet the rapid depressurization requirements of RTCA DO-160. The hardware has been tested for an altitude up to 50000 ft.

Operators should account for other environmental conditions that may hinder the use of the EFB (temperature, vibrations...) depending on their operations specificities.