HONG KONG

CIVIL AVIATION DEPARTMENT

CAD 562

ELECTRONIC FLIGHT BAG (EFB)

December 2011

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CONTENTS

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REFERENCE

AC120-76A	Guidelines for the Certification, Airworthiness, and Operational Approval of Electronic Flight Bag Computing Devices – Federal Aviation Administration (FAA)
TGL No.36	Approval of Electronic Flight Bag (EFBs) Temporary Guidance Leaflets (JAR-OPS) JAA Administrative & Guidance Material
ICAO State Letter SP 59/4-09/62	Proposed Amendments 54 to Annex 6, Part I, (Approval of Electronic Flight Bag) International Standards and Recommended Practices, ICAO
AC 43-32(0)	Acceptance and Use of Electronic Systems and Electronic Record Keeping Systems – Civil Aviation Safety Authority, Australia (CASA)
ETO (Cap 553)	Electronic Transactions Ordinance (www.blis.gov.hk)
ETO (Exclusion) Order (Cap 553B)	Electronic Transactions (Exclusion) Order (www.blis.gov.hk)
AN(HK)O 1995	Air Navigation (Hong Kong) Order 1995 (www.blis.gov.hk)

GLOSSARY OF TERMS

Electronic Flight Bag (EFB)

The practice of removal of paper aeronautical charts and other documentation from the cockpit, in some cases the cabin, through the use of either portable or installed electronic displays. EFB devices can display a variety of aviation data or perform basic calculations.

Controller Pilot Data Link Communications (CPDLC)

A data link application that allows for the direct exchange of text based messages between air traffic controllers and pilots.

Commercial –Off-The-Shelf (COTS)

Include computer software or hardware, technology or computer products that are readily made and available for use.

CHAPTER 1 – INTRODUCTION

1.1 General

The purpose of this publication is to provide detailed guidelines to operators regarding their application for EFB which is stipulated in the Air Operator's Certificate Requirements Documents, Chapter 4, Part I of CAD 360.

1.2 Components of an EFB

EFB is a system comprising hardware and software that provides:

- Flight Crew access to emerging electronic flight operations data, general purpose computing and communications. Similar application may be found available to the cabin in some cases.

- Replacement of many of today's paper documents.

- A range of implementations spanning portable electronic devices up to installed certified integrated systems.

CHAPTER 2 – HARDWARE SYSTEM

2.1 Hardware Classes of EFB System

This Chapter defines three hardware classes of EFB systems, Class 1, 2, and 3.

2.2 Class 1

Class 1 EFB systems are:

- Generally Commercial-Off-The-Shelf (COTS)-based computer systems used for aircraft operations,
- Portable, not attached to anything, typically stowed during critical phases of flight,
- Connect to aircraft power through a certified power source,
- Not attached to an aircraft mounting device,
- Considered as a controlled personal equipment device (PED),
- Normally without aircraft data connectivity except under specific condition,
- Class 1 EFB systems do not require Civil Aviation Department (CAD) Airworthiness Office (AWO) approval.

2.3 Class 2

Class 2 EFB systems are:

- Generally COTS-based computer systems used for aircraft operations,
- Portable, but available for use during critical phase via an airworthy mounting device,
- Connect to aircraft power through a certified power source,
- Connected to an aircraft mounting device during normal operations,
- Considered as a controlled personal equipment device (PED),
- Connectivity to Avionics is possible,
- Class 2 EFB systems require AWO approval.

2.4 **Class 3** [1]

Class 3 EFB systems are installed equipment requiring an AWO approval. (A typical example is at Appendix A for illustration purposes.)

- This approval should cover the integrity of the EFB hardware installation (e.g. server, display, keyboard, power, switching).
- Such aspects as the human machine interface should also be addressed.
- Require a Supplemental Type Certificate (STC) or certification design approval by aircraft certification services.

Remarks:

[1] Class 2.5 devices, which have a full STC but with uncertified software, is treated generally as Class 3 in this publication.

CHAPTER 3 – SOFTWARE APPLICATION

3.1 Software Applications for EFB Systems

The functionality associated with the EFB System depends upon the applications loaded on the host. The classification of the applications into two Types (A and B) is intended to provide clear divisions between the scope and therefore the approval process applied to each one. For classifying applications ineligible for Type A or Type B, please refer to Appendix B.

3.2 Type A

Type A software applications include pre-composed, fixed presentations of data currently presented in paper format. Type A software applications:

- May be hosted on any of the hardware classes.
- Require Operational approval. This will be processed by the CAD Flight Standards Office (FSO).
- Do not require an AWO approval.
- Typical examples of Type A software applications may be found in Appendix C.

3.3 Type B

Type B software applications include dynamic, interactive applications that can manipulate data and presentation. Type B software applications:

- May be hosted on any of the hardware classes.
- Require Operational approval. This will be processed by the CAD FSO.
- Do not require an AWO approval.
- Typical examples of Type B software applications may be found in Appendix D.

3.4 Other then Typed A or Type B

- See Appendix E.

CHAPTER 4 – AIRWORTHINESS APPROVAL

4.1 EFB Hardware Approval Process (Host Platform)

4.1.1 Class 1 EFB

A Class 1 EFB does not require an airworthiness approval because it is a non-installed equipment however paragraph 4.1.1.a) through 4.1.1.d) here below should be assessed if relevant. During the operational approval process an assessment should be made of the physical use of the device on the flight deck. Safe stowage, crashworthiness, security and use under normal environmental conditions including turbulence should be addressed.

(a) EMI Demonstrations

For the purpose of EMI demonstrations, EFB Class 1 devices may be considered as PEDs and should satisfy the criteria contained within TGL No. 29 or AC 91.21-1A. If the EFB system is to be used during critical phases of flight (e.g., during take-off and landing), further EMI demonstrations (laboratory, ground or flight test) are required to provide greater assurance of non-interference and ensure compatibility. For use during critical flight phases, the EFB system should comply with the requirements of ED-14/DO-160 Section 21, Emission of Radio Frequency Energy.

(b) Lithium Batteries

During the procurement of Class 1 EFBs, special considerations should be given to the intended use and maintenance of devices incorporating lithium batteries. In particular, the operator should address the following issues:

- Risk of leakage
- Safe storage of spares including the potential for short circuit
- Hazards due to on-board continuous charging of the device, including battery overheat

As a minimum specification, the lithium battery incorporated within the EFB device should have been tested to Underwriters Laboratory Inc (UL) Standard for Safety for Lithium Batteries reference UL 1642. The operator is responsible for the maintenance of EFB system batteries and should ensure that they are periodically checked and replaced when required.

(c) Power Source

The EFB power source should be designed such that it may be deactivated at any time. Where there is no possibility for the flight crew to quickly remove or un-plug the power to the EFB system, a clearly labelled and conspicuous means (e.g., on/off switch) should be provided. Circuit breakers are not to be used as switches; their use for this purpose is prohibited.

In order to achieve an acceptable level of safety, certain software applications, especially when used as a source of required information, may require that the EFB system have access to an alternate power supply.

(d) Data Connectivity

Data connectivity to other systems is not authorised except if connected to a system completely isolated from the avionics/aircraft systems [e.g., EFB system connected to a transmission media that receives and transmits data for Aircraft Administrative Communications (AAC) purposes on the ground only]. Any other type of data connectivity requires an airworthiness approval.

4.1.2 Class 2 EFB

A Class 2 EFB requires an airworthiness approval. However, this approval is limited in scope to the mounting device, crashworthiness, data connectivity and EFB power connection.

An evaluation of the EFB mounting device and flight deck location should be conducted as described below:

(a) Design of Mounting Device

The mounting device (or other securing mechanism) that attaches or allows mounting of the EFB system, may not be positioned in such a way that it obstructs visual or physical access to aircraft controls and/or displays, flight crew ingress or egress, or external vision. The design of the mount should allow the user easy access to the EFB controls and a clear view of the EFB display while in use. The following design practices should be considered:

(i) The mount and associated mechanism should not impede the flight crew in the performance of any task (normal, abnormal, or emergency) associated with operating any aircraft system.

(ii) Mounting devices should be able to lock in position easily. Selection of positions should be adjustable enough to accommodate a range of flight crewmember preferences. In addition, the range of available movement should accommodate the expected range of users' physical abilities (i.e., anthropometrics constraints). Locking mechanisms should be of the low-wear type that will minimize slippage after extended periods of normal use. Crashworthiness considerations will need to be considered in the design of this device. This includes the appropriate restraint of any class device when in use.

(iii) A provision should be provided to secure or lock the mount in a position out of the way of flight crewmember operations when not in use.

(iv) Mechanical interference issues of the mount, either on the side panel (side stick controller) or on the control yoke in terms of full and free movement under all operating conditions and noninterference with buckles etc. For yoke mounted devices Original Equipment Manufacturer (OEM) data should be obtained to show that the mass inertia effect on column force has no adverse affect on the aircraft handling qualities.

(v) If the EFB requires cabling to mate with aircraft systems or other EFBs, and if the cable is not run inside the mount, the cable should not hang loosely in a way that compromises task performance and safety. Flight crewmembers should be able to easily secure the cables out of the way during aircraft operations (e.g., cable tether straps).

(vi) Cables that are external to the mount should be of sufficient length to perform the intended tasks. Cables too long or short could present an operational or safety hazard.

(b) Placement of Mounting Device

The device should be mounted so that the EFB is easily accessible when stowed. When the EFB is in use (intended to be viewed or controlled), it should be within 90 degrees on either side of each pilot's line of sight. This requirement does not apply if the information is not being directly monitored from the EFB during flight. For example, an EFB may generate takeoff and landing V-speeds, but these speeds are used to set speeds bug or are entered into the FMS, and the airspeed indicator is the sole reference for the V-speeds. In this case, the EFB system need not be located in the pilot's primary field of view. 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 colours wash out or the displayed colour contrast is not discernible at the installation viewing angle). In addition, consideration should be given to the potential for confusion that could result from presentation of relative directions (e.g., positions of other aircraft on traffic displays) when the EFB is positioned in an orientation inconsistent with that information. For example, it may be misleading if own aircraft heading is pointed to the top of the display and the display is not aligned with the aircraft longitudinal axis. Each EFB system should be evaluated with regard to these requirements. (See CS-23.1321 and CS-25.1321.)

(c) EMI Demonstrations, Lithium Batteries, Power Source

In respect of the EMI demonstrations, use of lithium batteries and power source, see Paragraphs 4.1.1 a), b) and c) above.

(d) EFB Data Connectivity

EFB data connectivity should be validated and verified to ensure non-interference and isolation from aircraft systems during transmission and reception.

4.1.3 Class 3 EFB

A Class 3 EFB is considered as installed equipment and therefore requires an airworthiness approval. Assessment of compliance with the airworthiness requirements would typically concentrate on two areas:

- The intended function and safety (e.g., security and integrity), applicable only to the interfaces with the avionics data sources and not to the software applications. The failure modes of the interface between the EFB and its avionics data sources should be assessed under normal and fault conditions. The assessment of safety and integrity of the software application should be addressed through the approval of the application itself.

- Hardware and software qualification should be conducted in accordance with the agreed Design Assurance Level (DAL) for the system and its interfaces. Note: DAL attribution at this stage (empty platform) may prohibit hosting of future software applications due to inconsistency between the criticality of the future software application and the platform DAL.

A Class 3 EFB may form part of a host platform (i.e., a network server) supporting other functions such as central maintenance. Such functions are considered to be outside of the scope of this leaflet and their approval should be conducted in accordance with normal certification procedures.

For a Class 3 EFB a human factors assessment should be conducted. At this stage the evaluation is restricted to the EFB hardware resources comprising display, keyboard, switches, annunciators, etc. However, in order to assess the human factors aspects of these devices, it may be necessary to host emulation software on the platform. This may be a dedicated software package developed purely for the purposes of conducting the assessment or be one or more of the intended EFB software applications. The human factors assessment should be conducted in accordance with the criteria applied during the aircraft type design or modification exercise and identified within the aircraft certification basis. If no prior human factors requirements have been applied, the applicant should follow the process described in Appendix B.

4.1.4 Certification Documentation – Aircraft Flight Manual

For Class 2 and 3 EFB the Aircraft Flight Manual (AFM) should contain any limitations affecting the use of the EFB system e.g., a statement that a particular function is not intended as a primary navigation reference. Note: under certain circumstances a placard mounted adjacent to the EFB display might also be warranted. The AFM should also make reference to any applicable guidelines for application developers, operators and CAD.

CHAPTER 5 – FIVE PHASES PROCESS

5.1 An EFB application will involve a 5-step process as follows:

- Phase 1 – operator's initial request with prepared documents;

- Phase 2 – operator submits a plan and extracts of amendments to operations manuals and training manuals for EFIS, in complete and acceptable format, together with Form DCA 4041 (see Appendix F), for Flight Standards and Airworthiness Division (FSAD) of CAD to conduct a review and analysis;

- Phase 3 – CAD's in-depth study on regulatory compliance, safe operations, logical sequence, and areas of flight crew/dispatcher training and qualification (E-learning/tools training), acceptable procedures etc.;

- Phase 4 - major phase of validation testing – the operator conducts specific operations of data collection for CAD's observation; and

- Phase 5 – approval or disapproval by CAD.

5.2 Operational Approval of EFB relies on the operators to demonstrate to CAD that the system is robust and will not provide inaccurate or misleading information to crew. The onus is on the operator to show its fidelity and reliability.

CHAPTER 6 – ASSESSMENT PROCEDURE

6.1 There are two ways to start the EFB operations:-

(a) to keep paper back up as a cross check against EFB information, also as a means of mitigations against its failure or malfunction; or

(b) with no paper back up, a FULL operational Risk Assessment and suitable mitigation against failure or malfunction will be required. A combination of the two methods may also be available.

6.2 The assessment procedure upon the receipt of DCA 4041, together with the operator's complete package details, that comprehensively cover the approval procedure is summarised as follows:

(a) Operational Risk Analysis: mitigation against complete system failure. The source of backup data such as the QRH and the impact of MEL are to be considered fully.

(b) Human Machine Interface should be demonstrated by the operators to cover time-critical functions, symbols, terms & abbreviations, legibility of text, system responsiveness, use of colour, display of system status, error messages, multiple applications and active regions. Controls and inputs are linked with accessibility by crew to the system.

(c) Flight Crew Operating procedure: (involves a demonstration to a CAD Operations Inspector in the aircraft/simulator)

- Procedures for using EFB Systems with other Flight Deck Systems. Crew Operating procedure in their clarity of using EICAS, FMS & EFB for different purposes. Crew action on disagreement between one EFB and the other in particular to which is the assigned back-up.

- Establishment of flight crew awareness to EFB software/database revisions.

- Procedures to mitigate and/or control workload.

- Defining flight crew responsibilities for performance calculations.

- New functional roles of the flight crew and dispatchers.

- Usage of the EFB be consistent with the original flight deck design philosophy.

(d) Quality Assurance: there is the need of quality control on who holds authority onto the hardware and software, its maintenance, security and the issue of updated information to crew.

(e) EFB Administrator: a trained person with a good working knowledge on both hardware and software of EFB, who ensures adherence to suppliers' guidelines and conducts audit, random checks and follow up. He/She should be responsible for timely and accurate distribution of information to flight crew. This role and accountability can be by delegations and by establishing procedures to ensure compliance.

This person is to coordinate with Information Technology Management Unit (ITMU) of CAD for system set-up, as required, to create keys for access through user interface applicable to electronic records that warrant digital signature as the EFB administrator would be involved in an application like tech log/cabin log that requires electronic signature.

Notes:

(i) For some paper documents which warrant a written signature, digital signature may be applied to their electronic records using Asymmetric Cryptosystem and hash function or other means acceptable to CAD. (Please make reference to ETO (Exclusion) Order Schedule 2 Item 21.)

(ii) For paper documents that do not warrant a written signature, invariably their electronic record does not require a digital signature.

(iii) Not withstanding paragraphs (i) and (ii) this person is to ensure that the operator is in compliance with Article 57 and Schedule 12 of Air Navigation (Hong Kong) Order 1995, regarding documents to be carried by aircraft registered in Hong Kong. (Please also refer to ETO (Exclusion) Order, Schedule 4, Item 2.)

(f) Flight Crew Training: Operational crew must be trained before gaining approval to ensure a correct overview, pre-flight checks, limitations, operational function of each application, restriction on EFB use at different phases of flight, cross-checking, and CRM considerations. In this connection, additional training for new applications and recurrent training and proficiency checks as appropriate.

6.3 A satisfactory assessment of paragraphs 6.2 (a) to (f) will lead to a 6 months period of Operational Evaluation Test (OET) conducted by the operator with paper back up that is in observance with paragraph 7, Chapter 3 Part I of CAD 360, to verify the correctness and reliability of the EFB.

For no paper back up, a Line Oriental Flight Training (LOFT) to verify the normal and abnormal aspects with observation on the line flights by CAD Operations Inspector is required.

6.4 Final Report is to be produced by the operator after the OET, which sums up all activities conducted as a demonstrated means of compliance. This compliance summary, upon verification by CAD, may be accepted as a demonstrated means for subsequent EFB usage by the operator.

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Appendix A - The Typical Class 3 EFB System (for illustration purposes)

It has two (or three) flight deck-mounted display units (DU) and two (or three) electronic units (EU) mounted at the side panels or in the main equipment bay.

- The DUs are normally LCD monitors.
- The EUs are normally computer (Remote Processor Unit, termed RPU)
- The EUs provide the display output to the DUs, which show the current application and control and control display unit brightness.
- The systems are easy to boot up. There is an "IDENT" page which displays the results of self-diagnostic test during power up.
- The EUs (computers) primarily run the Window OS and enable the operationally-approved Windows applications. Further, some also run the Linux operating system (OS) or ANDROID.
- Communications between the EUs are provided by Ethernet ports on each EU and an Aircraft Interface Device (AID) provides data exchange with the ACARS system.

In case of electricity supply failure, each EU may be backed up by an individual battery supply for at least 30 mins. In the past, lithium battery was used but lately, to improve safety, nickel-metal-hydride-battery is built into each RPU. For cases without back up, to enable the need for redundancy, operator should also consider other independent power sources for the EFB.

During the descent, each operator should adopt a "sterile policy", such as below a certain altitude, no more modification should be made to the EFB, as a safety measure.

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Appendix B – EFB Classification Matrix and Derived Certification and Operational Approval

This appendix provides a matrix showing the relationship between the respective airworthiness and operational approval processes for all EFB Classes and Types.

EFB Applications	Hardware Class	Airworthiness Involvement	Operational Involvement
Type A Refer to Appendix C	**Class 1,2,3**	1) **Class 1**: No 2) **Class 2**: Yes, for • Mounting device • Power • Data Connectivity 3) **Class 3**: Yes for the EFB installation and human factor aspects 4) **Type A**: No	CAD Operations Inspector: • Risk Analysis • Human Factor assessment • Quality Assurance • System Administration • Crew Training • Operational Evaluation Test • Statement approval
Type B Refer to Appendix D	**Class 1,2,3**	1) **Class 1**: No 2) **Class 2**: Yes, for • Mounting device • Power • Data Connectivity 3) **Class 3**: Yes for the EFB installation and human factor aspects 4) **Type B**: No*	CAD Operations Inspector: • Risk Analysis • Human Factor assessment • Quality Assurance • System Administration • Crew Training • Operational Evaluation Test • Final report

*Subject to consultation and agreement with CAD. For applications deem ineligible for Type A or Type B EFB classification, refer to Appendix E.

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Appendix C – Examples of Type A Software Application

Based on JAR OPS TGL 36. Differences from FAA AC 120-76A are highlighted in bold text.

- Flight Crew Operations Manuals (FCOM) ***(Without contextual access based on sensed aircraft parameters)***
- Company Standard Operating Procedures (SOP)
- Airport diversion policy guidance, including a list of Special Designated Airports and/or approved airports with emergency medical service (EMS) support facilities
- Operations Specifications (OpSpecs)
- Cockpit observer briefing cards
- Airplane Flight Manuals (AFM) and Airplane Flight Manual Supplements (AFMS)
- Aircraft performance data (fixed, non-interactive material for planning purposes)
- Airport performance restrictions manual (such as a reference for takeoff and landing performance calculations)
- Maintenance manuals
- Aircraft maintenance reporting manuals
- Aircraft flight log and servicing records
- Autopilot approach and autoland records
- Flight Management System/Flight Management and Guidance System problem report forms
- Aircraft parts manuals
- Service bulletins/published Airworthiness Directives, etc.
- Air Transport Association (ATA) 100 format maintenance discrepancy write-up codes
- Required VHF Omni directional Range (VOR) check records
- Minimum Equipment Lists (MEL) ***(Without contextual access based on sensed aircraft parameters)***

- Configuration Deviation Lists (CDL)
- Federal, state, and airport-specific rules and regulations
- Airport/Facility Directory (A/FD) data (eg, fuel availability, LAHSO distances for specific runway combinations, etc.)
- Noise abatement procedures for arriving and departing aircraft
- Published (graphical) pilot Notices to Airmen (NOTAM)
- International Operations Manuals, including regional supplementary information and International Civil Aviation Organization (ICAO) differences
- Aeronautical Information Publications (AIP)
- Oceanic Navigation progress logs
- Pilot flight and duty-time logs
- Captain's report (ie, captain's incident reporting form)
- Flight crew survey forms (various)
- Cabin Staff Manuals
- EMS reference library (for use during medical emergencies)
- Trip scheduling and bid lists
- Aircraft's captain's logs
- Aircraft's CAT II/CAT III landing records
- Antiterrorism profile data
- Hazardous Materials (HAZMAT)/oxidizer look-up tables
- Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods ICAO Doc 9481-AN/928
- Customs declaration
- Special reporting forms, such as Safety Reports, Airprox and Bird Strike reports

- Incidents of interference to aircraft electronic equipment from devices carried aboard aircraft
- Current fuel prices at various airports
- Aircraft operating and information manuals
- Flight operations manuals including emergency procedures
- Airline policies and procedures manuals
- Aircraft Maintenance Manuals
- Flight crew qualifications record keeping, including aircraft qualifications, CAT II/III, high minimums, landing currency, flight and duty time, etc.
- PIC currency requirements
- **Weather information in a pre-composed format**

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Appendix D – Examples of Type B Software Applications

Based on JAR OPS TGL 36. Difference from FAA AC 120-76A are highlighted in **bold text**.

- Flight Crew Operations Manuals (FCOM) with contextual access based on sensed aircraft parameters
- Takeoff, en route, approach and landing, missed approach, go-around, etc., performance calculations. Data derived from algorithmic data or performance calculations based on software algorithms [1]
- Power settings for reduced thrust settings [1]
- Runway limiting performance calculations [1]
- Weight and balance calculations [1]
- Minimum Equipment Lists (MEL) with contextual access based on sensed aircraft parameters
- Panning, zooming, scrolling, and rotation for approach charts
- Pre-composed or dynamic interactive electronic aeronautical charts (eg, en route, area, approach, and airport surface maps) including, centring and page turning but without display of aircraft/own-ship position [2]
- Electronic checklists, including normal, abnormal, and emergency (Without contextual access based on sensed aircraft parameters) [3]
- Applications that make use of the Internet and/or other AAC or company maintenance-specific data links to collect, process, and then disseminate data for uses such as spare parts and budget management, spares/inventory control, unscheduled maintenance scheduling, etc. (Maintenance discrepancy logs need to be downloaded into a permanent record at least weekly)
- **Weather information with graphical interpretation**
- Cabin-mounted video and aircraft exterior surveillance camera displays
- Cabin defects log, passenger manifest and seating plans

Remarks:

[1] Application for performance, weight and balance computations including pre-composed and interactive data may be classified as a Type B, subject to consultation and agreement with CAD during the operational approval process. Otherwise, such applications should follow a normal airworthiness approval process. Pre-composed electronic Aeronautical charts should be promulgated in accordance with Electronic Aeronautical Chart Display – ICAO, Chapter 20 Annex 4 of International Civil Aviation Organization Standards and Recommended Practices.

[2] Dynamic interactive charts may need to follow a normal airworthiness approval process if functionality, accuracy, refresh rate and resolution enable to use this application as a navigation display.

[3] Electronic checklist may be classified as a Type B, subject to consultation and agreement with CAD during the operational approval process. Otherwise, such applications should follow a normal airworthiness approval process.

Appendix E – Applications Ineligible for Type A or Type B EFB Classification (Termed as Type C by FAA)

The list below includes software applications that are considered by the CAD to be ineligible for classification as either Type A or B and will need to go through a full airworthiness approval process: [1] & [2]

- Any application displaying information which may be directly used by the flight crew to control aircraft attitude, speed, altitude (eg, PFD type of display). [3]

- Any application displaying information which may be directly used by the flight crew to check or control the aircraft trajectory, either to follow the intended navigation route or to avoid adverse weather, obstacles or other traffic, in flight or on ground. Moving maps, or presentation of weather maps, terrain, other aircraft positions relative to ownship's position could fall into this category if accuracy, refresh rate and resolution are sufficient. [3]

- Any application displaying information which may be directly used by the flight crew to assess the status of aircraft critical and essential systems status, and/or to manage aircraft essential and critical systems following failure. [3]

- Any application enabling primary means of communications related to air traffic services, or whereby the flight path of the aircraft is authorised, directed or controlled.

- Any application substituting or duplicating any certified avionics systems.

- Applications which due to automatic interactions with other aircraft systems, displays and controls would raise significant human factors issues.

Remarks:

[1] Applications covered by an AWO approval may contain user-modifiable software or data. The boundaries of the user-modifiable parts should be defined as part of the airworthiness approval.

[2] In case of doubt on the applicability of the above criteria, the application developer should contact the responsible authority and seek advice.

[3] The wording "may directly be used by the flight crew" in the above criteria is intended to assess the potential use by the crew considering the functional capability of the application.

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香港特別行政區政府
民航處
Civil Aviation Department
The Government of the Hong Kong Special Administrative Region

APPLICATION FOR ELECTRONIC FLIGHT BAG OPERATIONAL APPROVAL*

**Sample only: please download the latest version from www.cad.gov.hk/english/application.html*

Please complete the form in BLOCK CAPITALS using black or dark blue ink after reading the attached guidance.

This form is designed to elicit all the required information from those operators requiring the Electronic Flight Bag (EFB) operational approval. Completed form should be submitted to the Civil Aviation Department, Flight Standards and Airworthiness Division (FSAD), 10th Floor, Commercial Building, Airport Freight Forwarding Centre, 2 Chun Wan Road, Lantau, Hong Kong.

The assessment to the application of EFB Operational Approval is based on CAD 562.

1. SCOPE & GENERAL INFORMATION

1.1△	**EFB**	Hardware class: ☐1 ☐2 ☐3 Software application(s) type: ☐A ☐B
1.2△	**Operator Name**	
	Flight OPS Manager	Tel:
	EFB Training Manager	Tel:
	EFB Administrator	Tel:
	EFB Administrator e-mail contact	
1.3	**Aircraft Registration(s)**	
	Manufacturer	
	Type/Model(s)	
	Serial No(s)	

△See Paragraph 8

2. HARDWARE PLATFORM

2.1	**Hardware Type No.**	
2.2	EFB to be used	☐ on ground ☐ in-flight cruise only ☐ in-flight all phases
	EFB to be used by	☐ Cockpit crew ☐ Cabin crew
2.3[Δ]	**Data Storage Device**	☐ HD ☐ CD ☐ DVD ☐ FD ☐ Other
	Remark	
2.4[Δ]	**Data Transfer Device**	Bluetooth ☐ IR ☐ USB ☐ Firewire ☐ Serial ☐ Parallel ☐ Other ☐
	Remark	
2.5[Δ]	**Cursor Navigation**	Touch screen ☐ Touch pad ☐ Mouse ☐ Track ball ☐ Keyboard ☐ Other ☐
	Installed and used	
	Remark	
2.6	**Lithium Battery Used**	☐ yes ☐ no
	If yes →	☐ Specific items are addressed and regulations are included in the operational documentation.
2.7	**Onboard Power Used**	☐ yes ☐ no
	If yes →	Power source certified to be used ☐ in-flight ☐ on ground

3. SOFTWARE APPLICATION(S)

3.1[Δ]	**Operating System Description**	(e.g. MS Windows, MAC, Linux or Android)
	Remark	
3.2[Δ]	**Program(s) Based on**	☐MS Office ☐Adobe PDF ☐Html ☐Manufacturer Application
	Remark	
3.3	**Kind of Software**	☐ Data presentation ☐ Data processing
	Remark	
3.4	**Program Settings**	handled by ☐ System administrator ☐ End user
	Remark	
3.5[Δ]	**Intentions / Tasks to be Done by EFB**	
3.6[Δ]	**Classification**	☐ Type A ☐ Type B

[Δ]See Paragraph 8

4. OPERATION & TRAINING DOCUMENTATIONS

	Scope:	Document Number /Chapter and Subchapter of the Relevant Manual
4.1	**System Administration & Database Update**	
4.2	**System Description**	
4.3	**System Operation**	
4.4	**System Failure (Contingency Procedure)**	
4.5	**Crew Basic Training**	
4.6	**Crew Recurrent Training**	
4.7	**MEL Reference**	

5. AIRWORTHINESS DOCUMENTATIONS

	Scope:	Document Number /Chapter and Subchapter of the Relevant Manual
5.1[Δ]	**Certification Documentation**	
5.2[Δ]	**Instruction for Continuing Airworthiness**	

6. APPLICATION PACKAGE

Operations manual(s) extract(s) and/or checklist(s) that include EFB operating practices and procedures.

☐ OM/A ☐ OM/B ☐ OM/C ☐ OM/D ☐ QRH ☐ MEL ☐ AFM ☐ Others

☐ EMI demonstration report ☐ Operational Risk Analysis

[Δ]See Paragraph 8

7. EFB APPLICANT'S STATEMENT

The undersigned certify the enclosed information to be complete and true and that the system installation, continuing airworthiness of systems, minimum equipment for dispatch, operating procedures and flight crew training comply with the requirements of CAD 562.		
Name of EFB Administrator	Signature:	Date:
Name of Flight OPS Manager	Signature:	Date:
Name of EFB Training Manager	Signature:	Date:

8. NOTES FOR APPLICATION

Most of the fields are self-explanatory. Those probably requiring further explanations are listed below:

1.1	EFB	Evaluate hardware class (1, 2 or 3) and software type (A, B or A+B) from the criteria stated in CAD 562.
1.2	Operator	In addition to the phone contacts to the responsible persons, please provide an e-mail address for EFB Administrator as he/she is the focal point of contact.
2.3	Data storage device	If [Other] is ticked, more information shall be given under [Remark].
2.4	Data transfer device	
2.5	Cursor navigation	
3.1	Operating System	If the operating system used is not addressed in the selection, information shall be given under [Remark].
3.2	Program(s) Based on	If the program used is not addressed in the selection, information shall be given under [Remark].
3.5	Intention/Tasks to be done by EFB	List or describe all tasks, with reference to CAD 562 Appendix C and D, to be handled by the proposed EFB.
3.6	Classification	State Classification according CAD 562 Chapter 4 and Appendix C and D.
5.1	Certification Documentation	The Certification documentation should be demonstrated according to CAD 562 Chapter 4.
5.2	ICA Documentation	Documents such as Maintenance Schedule, Maintenance Manual and IPC.

When completed, the form should be signed by the relevant persons. The application package should comprise the following documents:

- EFB application form
- Extract of OM A/B/C/D containing any information about the EFB such as system description, limitations, operating procedures and the operator's quality system related to the EFB
- Compliance checklist(s) for revised Manual(s)
- Any certification documents of concern

Note: A minimum of 30 working days will normally be required to check and confirm the information given above. If data and/or application package are missing or omitted the process may take considerably longer.

9. APPROVAL ASSESSMENT (FOR CAD USE ONLY)

Subject	**Responsible**	**Signature**	**Date**
Application package complete	FSO		
Operational and training document reviewed and considered satisfactory	FSO		
Airworthiness document reviewed and considered satisfactory	AWO		
Demo: Simulator ☐ Aircraft ☐	FSO		
Evaluation Test agreed to commence on …….	FSO		
Operator's Evaluation Test reports reviewed and considered satisfactory	FSO		
	AWO		
EFB approval issued & process completed	FSO		

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