OPERATIONAL SUITABILITY REPORT

Fujitsu Stylistic LT C-500

Class 2 Electronic Flight Bag (EFB)

Johnathon A Vetter
Chairman, Flight Standardization Board
(FSB)

Date: March 02, 2007

Federal Aviation Administration
Kansas City Aircraft Evaluation Group (MKC-AEG)
901 Locust
Kansas City, Missouri 64106
Telephone: (816) 329-3233
FAX (816) 329-3241

MANAGEMENT COORDINATION SHEET

Walter J. Hutchings Date: 03/27/2007
Manager, Kansas City Aircraft Evaluation Group

Thomas Toula Date: 04/05/2007
Manager, Air Transportation Division, AFS-200

REVISION RECORD

Revision	Pages	Approval Date	Chairman
Original	All	12/06/2006	John Vetter
Revision 1	All	03/02/2007	John Vetter

Highlights of Change

Revision 1: Change Report format to Operational Suitability Report and added Management Coordination page. Combines reports for the Fujitsu Stylistic LT C-500 for the Hawker 800 series and the BE-400A report completed by SEA-AEG, Michael F. Garret, 12/21/5004 into one report. Update the EFB FSB report to current JeppView – FlightDeck software. Specify requirements for Non-Normal procedures.

Table of Contents

1. Purpose and Applicability

This FSB report specifies FAA requirements applicable to operators seeking to use the **Fujitsu Stylistic LT C-500 Electronic Flight Bag (EFB)** as a Class 2 EFB for all modes of flight operation. Provisions of this report are consistent with the guidance defined in FAA Advisory Circular 120-76A and presumes appropriate airworthiness certification for installation of the EFB is/will be accomplished.

Purpose
The following information related to operational suitability is included:

1.1 A general description of the EFB system evaluated under this report, including:
- EFB manufacturer
- EFB model
- A list of major components within the EFB
- The EFB operating system and version
- A list of the applications evaluated under this report.

1.2 The manufacturer's name and model number of the mounting system evaluated under this report. Reference to the Part 25 certification of the mounting system is also included.

1.3 EFB Display Lighting and Reflectivity

1.4 Typical acceptable procedures for EFB use during all phases of flight

1.5 Typical acceptable procedures to follow when one unit fails and when both units fail to include alternate means of accessing data.

1.6 A revision process procedure/method that ensures appropriate database accuracy and currency.

1.7 FSB specifications for training and typical acceptable training course description

1.8 FSB specifications for Checking including specification of those checks that must be administered by FAA or operators.

1.9 FSB specifications for Currency

1.10 Portable Electronic Device Non-Interference

1.11 Electromagnetic Interference (E.M.I.)

1.12 Rapid Depressurization Testing

1.13 Operating system change requirements

1.14 Configuration Control, including the procedures which govern the distribution of updates to the aircraft and confirmation of the aircraft EFB configuration.

1.15 Instructions for Continued Airworthiness

1.16 Compliance Checklist

1.17 FSB Specifications for Devices and Simulators (Reserved)

1.18 The applicability of this report

1.19 Alternate Means of Compliance

1.20 List of documents or their operator equivalents, to meet the requirements of AC120-76A for operational suitability and continued airworthiness. (Appendix 1)

1.21 List regulatory compliance status (compliance checklist) for pertinent parts of the FARs (Appendix 2)

Applicability
The following aircraft have received operational evaluation for the **Fujitsu Stylistic LT C-500, Class 2 EFB with Aircraft Tools & Accessories, Model FG 3500-800 Mounting System**:

Raytheon Aircraft Company, BAe-125-800A
Raytheon Aircraft Company, Hawker 800
Raytheon Aircraft Company, Hawker 800XP
Raytheon Aircraft Company, Hawker 850XP

The following aircraft have received operational evaluation for the **Fujitsu Stylistic LT C-500, Class 2 EFB with NOGA Engineering, HOLD-IT Model MG Mounting System**:

Raytheon Aircraft Company, Hawker 400A
Raytheon Aircraft Company, Hawker 400

2. EFB Description

The Electronic Flight Bag (EFB) system provides electronic flight deck data storage and retrieval that maybe used to present a variety of aviation data traditionally provided in paper form. This system is a class 2 EFB system using one side-mounted display and one back-up unit stowed and accessible to the pilots while seated to provide availability of Type B applications that require display for all modes of flight operations.

The EFB evaluated by this report consists of a Commercial-Off-The-Shelf (COTS) tablet computer with the Microsoft Windows operating system and applications as listed. The mounted EFB is viewable for takeoff and landing and can be connected to an existing airplane power source (PED outlet) for battery charging.

2.1 Manufacturer. This EFB has been manufactured by Fujitsu.

2.2 Model. Fujitsu Stylistic LT C-500. The part number for this EFB is FMW4303TS256A01.

2.3 Components. The following major components are included with this make/model of EFB

Component	Manufacturer	Model	Part Number
Motherboard	Intel	440MX-100	CP048311-102
BIOS	Phoenix	Rev 1.05	
Processor	Intel	Celeron 500Mhz	Integrated on board
Display	Fujitsu	LCD	Integrated video
Hard Drive	Toshiba	HDD2146	
CD-ROM	Addionics	AECD9824	CP004515-01
Wireless Connection	none		
Power Supply (primary)		Lithium ion battery	
Power Supply (secondary) DC input	Land Electronics	FJ1640-616	

2.4 Operating System and Version. This EFB has been demonstrated with Microsoft Windows XP Professional, Service Pack 1.

Additional Software Demonstrated: Adobe to display documents, UltraNav software for weight & balance and performance, and JeppView – FlightDeck for display of approach charts.

2.5 Applications.
The following applications have been demonstrated for use on this specific EFB.

Airplane specific information used in these applications must be verified accurate to respective aircraft.

2.5.1 Type A Applications (Using Adobe, Microsoft Office)
- Flight Operations Manual (FOM)
- Standard Operations Procedures (SOP)
- Weight and Balance Data Operations Specifications (Opspecs)
- Maintenance Manuals (AMM)
- Illustrated Parts Catalog (IPC)
- Minimum Equipment List (MEL)
- Configuration Deviation List (CDL)
- Aeronautical Information Manual (AIM)
- Title 14 of the Code of Federal Regulations (14 CFR)
- Airplane Maintenance Manuals
- General Maintenance Manuals

2.5.2 Type B Applications (Using JeppView – FlightDeck and UltraNav software)
- Non-interactive electronic approach charts in pre-composed format (Aircraft own ships position using GPS is not authorized)
- Weight and Balance calculations
- Runway limiting performance calculations
- Takeoff, en-route, approach and landing, missed approach, go-around performance calculations
- Power settings calculations

2.5.3 Type C Applications
- No Type C applications are applicable or evaluated.

3. EFB Mounting System or Stowage

3.1 Mounting and Stowage
Dual EFB availability is required. The primary EFB is to be mounted on right forward outboard sidewall and viewable by both pilots. The secondary or backup EFB is stowed accessible to pilots while seated. Accessibility to both EFB devices while the flight crew is seated is required. These provisions have been evaluated and found to be acceptable for all phases of flight.

3.2 EFB Mounting System

3.2.1 800 SERIES: The EFB mounting system identified in this report is manufactured by Aircraft Tools and Accessories. The mount has received DER approval through Engineering Directive # EDW01-1. The remainder of the installation is Field Approved with FAA Form 337 issued by AEA FSDO 23. There is one operating limitation associated with the EFB mounting system. The aircraft must be placarded in conjunction with the installation of the mounting device. The mounted primary EFB must be locked in stowed position for Taxi, Takeoff and Landing. Stowed position is mounting arm adjusted to the lowest, most outboard position and secure with thumbscrew.

3.2.2 400 SERIES: The EFB mounting system identified in this report is manufactured by Noga Engineering. The model number of this mount is HOLD IT model MG. The mount has received DER approval through Engineering Directive # EDW01-1. The remainder of the installation is Field Approved with FAA Form 337 issued by AEA FSDO 23. There is one operating limitation associated with the EFB mounting system. The aircraft must be placarded in conjunction with the installation of the mounting device. The mounted primary EFB must be secured most forward and outboard position during Taxi, Takeoff, and Landing.

4. EFB Display Lighting and Reflectivity

4.1 Display Lighting.
This EFB has been evaluated in both low-light and full sunlight conditions. The display is readable under the full range of lighting conditions without distraction. Screen protectors, if installed, must be maintained in good condition to preclude opacity.

4.2 Display Reflectivity.
The display has been evaluated under night lighting conditions. There is no distracting reflectivity observed from the display under these conditions.

5. Acceptable Operations Procedures for Use of EFB

5.1 Normal operating procedures must be included in the applicable airplane General Operations Manual and Flight Crew Training Manual and Cockpit Checklists. Descriptions of specific applications may be contained in a “User Guide” supplied by the application vendor.

5.2 Non-Normal procedures for use with the EFB must be developed for failure of one unit and for failure of both units to provide procedures for alternate access to data.

5.3 Current Pertinent Aeronautical Charts for en route navigation, terminal area charts and approach charts for departure, destination, alternates and diversion airports must be available during all phases of flight operations by either printed, electronic or a combination of these formats. If electronic format is used, dual redundancy is required.

6. Acceptable EFB Data Revision Process

6.1 An acceptable data revision process is to use an established secure data distribution network. Data will be loaded to the EFB using procedures included in the operator's manual system. This data distribution system must include the procedures to protect the EFB devices from virus infection and other threats to the system. It must also include the process by which the operator assures that the data distribution system assures delivery and installation of the updates.

7. FSB Specifications for Training

7.1 General. Successful completion of EFB training is required. EFB training programs must be FAA approved when specified by FAR. An FAA approved Computer Based Training course carried out on either a desktop or laptop computer is an acceptable means of conducting EFB training.

7.2 Programs Crediting Previous EFB Experience. Training programs for the EFB may take credit for previous EFB experience. For example, previous experience using a Class 1 or 2 performance application using 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 information regarding previously approved programs or programs crediting previous EFB experience, FAA Principal Inspectors for other operators may be consulted.

7.3 Pilots Initial, Transition and Upgrade Ground Training

7.3.1 Initial Training. Initial EFB training is accomplished as specified by this FSB report or included in an approved training program. Initial training should be conducted at Level C. The EFB serves as the required training device.

7.3.2 Areas of Emphasis. Operators must emphasize during EFB training and during initial line operating experience the need to avoid fixation on the display during critical phases of flight including taxi operations.

7.4 Pilot Recurrent Training

7.4.1 Recurrent training is not normally required for EFB operation provided the functions are used regularly in line operations. Operators are encouraged to include EFB as a component of simulator recurrent training to the extent practical.

7.4.2 As part of an approved training program, an operator may use many methods when conducting recurrent training, including classroom instruction, pictures, videotape, ground training devices, computer-based instruction, and static aircraft training.

7.4.3 Recurrent Training Simulator Requirements (reserved)

8. FSB Specifications for Checking

8.1 Checking Items. Pertinent knowledge, procedures for EFB use should be checked following initial EFB training. This checking may be accomplished as an automated component of EFB computer-based training. Operators are encouraged to include EFB use as a part of recurrent checking where practical. Proper EFB use should be included in line checks.

8.2 Areas of emphasis. The following areas of emphasis should be addressed during line checks as necessary:

Proficiency with use of EFB applications must be demonstrated,
Proper outside visual scan without prolonged fixation on EFB operation should be demonstrated, and failure of component(s) of the EFB should be addressed,
Proper selection and use of EFB displays should be demonstrated.
Proper display of approach charts should be demonstrated
Proper cross-check of data entered into the performance application

8.3 Proficiency Checks/Practical Tests. At the discretion of the evaluator, and if the EFB is installed in the operator's training device or simulator, EFB may be included in the practical testing and annual proficiency checks.

9. FSB Specifications for Currency

9.1 Assuming EFB is used on a regular basis, no unique currency provisions apply to the EFB.

10. Portable Electronic Device Non-Interference (91.21)

The operator is responsible to determine non-interference of this Class 2 EFB in accordance with Advisory Circular 91.21A Use of Portable Electronic Devices Aboard Aircraft.

11. Electromagnetic Interference (E.M.I.)

The Stylistic LT C-500 has been tested by the US Air Force for EMI and meets the requirements of AFI 11-202V3, Para. 2.5, for operations during all phases of flight on all helicopter and fixed wing Air Force aircraft

Changes of any of the components listed in paragraph 2.3 will require that the EFB is checked again for acceptable levels of EMI.

12. Rapid Depressurization Testing

Depressurization testing has been conducted on similar Fujitsu Pen Tablets (Fujitsu Models LT P-600 and C-500). No faults were evident after the rapid depressurization that would prevent continued normal operation of the EFB. The operator is responsible to determine pressure altitudes where the unit will function normally while operating and develop EFB procedures accordingly.

13. Operating System

Changes to the Windows operating system that involve .exe, .dll files or Java scripts or change in Versions of Additional Software will require that the operator notify the FAA Principal Inspector that the operation of all evaluated applications continues to meet intended function.

14. Configuration Control

The certificate holder or the operator will need to satisfy the Principal Inspector that they have procedures in place to manage the hardware and software configuration of any Class 2 EFB devices that will be in operational use.

15. Instructions for Continued Airworthiness

The certificate holder or the operator is responsible to demonstrate that they have procedures in place to track repairs to EFB units and to ensure each EFB remains in compliance with the evaluated configuration. Regular battery maintenance is required to maintain EFB useful functionality on battery power only. Battery replacement is required to maintain adequate useful battery life in designated operating configuration.

16. Compliance Checklists

16.1 Compliance Checklists (see Appendix 2). Compliance checklists are provided as an aid to identify those specific rules or policies for which compliance has been demonstrated to FAA. The checklist includes rules or policies for which compliance must be demonstrated by individual operators. Not all rules, policies or variants are necessarily listed or addressed.

16.2 Discussion of Specific Compliance Checklist Items (reserved)

17. FSB Specifications for Devices and Simulators (Reserved)

18. Application of FSB Report

Relevant parts of this report are effective for the specific combination of EFB and aircraft model specified in this report when this report is approved by the FAA.

19. Alternate Means of Compliance

19.1 Approval Level and Approval Criteria. Alternate means of compliance to the provisions of this report, must be approved by MKC-AEG. If alternate compliance is sought, operators will be required to establish that any proposed alternate means provides an equivalent level of safety to the provisions of AC 120-76A and this FSB report. Analysis, demonstrations, proof of concept testing, differences documentation, or other evidence may be required.

19.2 Requires Equivalent Safety. In the event alternate compliance is sought, training program hour reductions, simulator approvals, and device approvals, may be significantly limited and reporting requirements may be increased to assure equivalent safety. FAA will generally not consider relief through alternate compliance means, unless sufficient lead time has been planned by an operator to allow for any necessary testing and evaluation.

19.3 Unforeseen Circumstances. In the event of clearly unforeseen circumstances in which it is not possible for an operator to comply with report provisions, the operators may seek an interim equivalent program rather than a permanent alternate compliance method. Financial arrangements, schedule adjustment, and other such reasons are not considered “unforeseen circumstances” for the purposes of this provision.

20. Miscellaneous - (Reserved)

Appendix 1

List of Affected Documents and Artifacts for Operational Suitability and Continued Airworthiness

Flight Crew Operations Manual
Cockpit Checklists

Flight Crew Training Manual

Training Courseware
- Flight Crew
- Maintenance Personnel
- Operations Office Personnel

Electronic Flight Bag Pilot's Guide

Company Maintenance Procedures
Component Maintenance Manual

Minimum Equipment List

Data Delivery and Management Description and Procedures

EFB Configuration Control Description and Procedures

Appendix 2

Compliance Checklist

The provisions of this report have shown compliance with the following regulations:

(1) Title 14 CFR §§ 91.9, 91.21, 91.103, 91.167, 91.169, 91.503, 91.605, 91.1023, 91.1025, 91.1063, 91.1065, 91.1067, 91.1069, 91.1073, 91.1075, 91.1077, 91.1079, 91.1081

(2) Title 14 CFR §§ 135.21, 135.23, 135.63, 135.81, 135.83, 135.144, 135.179, 135.213, 135.293, 135.297, 135.299, 135.323, 135.325, 135.327, 135.329.