

Publications, Training, and Logistic Services

Course Syllabus: 523-0821908

COURSE TITLE: Pro Line Fusion King Air C90GT/B200GT/B200CGT/B300
Operations & Flight Line Maintenance

PREREQUISITES: Students should have basic knowledge of aircraft avionics systems and a working command of the English language (interpreters are available for special cases).

PURPOSE: This course provides line maintenance personnel with training to operate and perform flight-line maintenance for the King Air Pro Line Fusion System.

This course is designed to teach troubleshooting for replacement of line replacement units (LRUs) and does not include internal maintenance of any component.

This course meets the requirements of ATA Spec 104 Level 3.

The Pro Line Fusion System consists of the LRUs identified in the section titled EQUIPMENT TYPE by nomenclature and part number, including associated peripheral equipment identified as deliverable hardware.

OBJECTIVES: Upon completing this course, the student will be able to:

1. Provide an overall understanding of King Air Pro Line Fusion Avionics Principles and Operation.
2. Identify System Components and the Functional/Operational Characteristics of each LRU.
3. Identify Typical Aircraft System Interface/System Architecture.
4. Perform Fault Isolation to a faulty LRU using Built-In Maintenance Diagnostics.
5. Perform software loading.

COURSE LENGTH: 5 Days

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TRAINING DEVICES:

1. Special Test Equipment
 - a. King Air Pro Line Fusion Test Rig, Cedar Rapids (if available)
 - b. King Air Pro Line Fusion aircraft (if available)
 - c. King Air Pro Line Fusion FMS Desktop Simulator (if available)

REFERENCES:

Release 2 Manuals

- | | |
|---|-------------|
| 1. Pro Line Fusion for King Air Avionics Maintenance Manual | 523-0821905 |
| 2. Pro Line Fusion for King Air Fault Isolation Manual | 523-0821906 |
| 3. Pro Line Fusion for King Air Wiring Diagram Manual | 523-0821907 |
| 4. Pro Line Fusion for King Air Quick Reference Guide | 523-0822518 |
| 5. Pro Line Fusion for King Air Operator Guide | 523-0820001 |

Release 3 Manuals

- | | |
|---|-------------|
| 6. Pro Line Fusion for King Air (Release 3) Avionics Maintenance Manual | 523-0824677 |
| 7. Pro Line Fusion for King Air (Release 3) Fault Isolation Manual | 523-0824683 |
| 8. Pro Line Fusion for King Air (Release 3) Operator Guide | 523-0824675 |
| 9. Pro Line Fusion for King Air (Release 3) Wiring Diagram Manual | 523-0824684 |

Release 4 Manuals

- | | |
|--|-------------|
| 10. Pro Line Fusion for King Air (Release 4) Avionics Maintenance Manual | 523-0829639 |
| 11. Pro Line Fusion for King Air (Release 4) Fault Isolation Manual | 523-0829640 |
| 12. Pro Line Fusion for King Air (Release 4) Pilot Guide | 523-0829638 |
| 13. King Air (Release 4) Pro Line Fusion Wiring Diagram Manual | 523-0829641 |

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COURSE SYLLABUS

0. Welcome & Introductions

- A. Course Overview
 - i. Welcome
 - ii. Student Registration
 - iii. Student Policies and Procedures

1. Introduction to Materials and Handouts

- A. Video – Introduction to Pro Line Fusion
- B. Video – System Components
- C. Load Electronic Media Containing the Course Material into computer
- D. Presentation 1 - Manuals
- E. Demonstrate the Functions/Operations of PDF Files

2. Aircraft Overview

- A. Cockpit Layout
- B. Reversion Switch Panel
- C. Antenna Locations

3. Chapter 22 – Flight Guidance System

- A. Overview
 - i. Video – Auto Pilot – Flight Guidance Panel
- B. Flight Guidance Computers (FGC)
 - i. Description
 - ii. Theory of Operation
 - iii. Location
- C. Flight Guidance Panel (FGP)
 - i. Description
 - ii. FGP Switch Operations
 - iii. Theory of Operation

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- D. Primary Servos (SVO)
 - i. Description
 - ii. Theory of Operation
- E. Autopilot and Yaw Damper Theory of Operation
 - i. Description of Fail Passive
 - ii. Description of Yaw Damper System
- F. Autopilot Diagnostics
 - i. Report Mode
 - ii. Input Mode
 - iii. Output Mode
 - iv. Description and Operation of FIM

4. Chapter 23 - Communications

- A. Overview
 - i. Video – Radio Tuning
- B. VHF
 - i. Description
 - ii. Theory of Operation
 - iii. Location
 - iv. System Block Diagram
 - v. Bus Diagram
 - vi. Wiring Diagram
- C. HF
 - i. Description
 - ii. Theory of Operation
 - iii. Location
 - iv. System Block Diagram

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- v. Bus Diagram
- vi. Wiring Diagram

D. Data Link

- i. Description
- ii. Theory of Operation
- iii. Location
- iv. ACARS
 - 1. CPDLC
- v. System Block Diagram
- vi. Bus Diagram
- vii. Wiring Diagram

E. Radio Interface Unit (RIU)

- i. Description
- ii. Theory of Operation
- iii. Location

5. Chapter 31 – Indication and Recording

A. Integrated Avionics Processing System (IAPS)

- i. Overview
- ii. Description
- iii. Safety Practices
- iv. Theory of Operation
- v. System Block Diagram
- vi. Remove and Install
- vii. Troubleshoot

B. Integrated Card Cage (ICC)

- i. Description
- ii. Theory of Operation

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- iii. Location
- iv. Remove and Install
- v. Troubleshoot
- C. Power Supply (PWR)
 - i. Description
 - ii. Theory of Operation
 - iii. Block Diagram
 - iv. Location
 - v. Remove and Install
 - vi. Troubleshoot
- D. Internal Environmental Controller (IEC)
 - i. Description
 - ii. Theory of Operation
 - iii. Block Diagram
 - iv. Location
 - v. Remove and Install
 - vi. Troubleshoot
- E. Input/Output Concentrator (IOC)
 - i. Description
 - ii. Theory of Operation
 - iii. Block Diagram
 - iv. Location
 - v. Remove and Install
- F. Configuration Strapping Unit (CSU)
 - i. Description
 - ii. Theory of Operation
 - iii. Block Diagram

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- iv. Location
- v. Remove and Install
- G. Data Concentrator Unit (DCU)
 - i. Description
 - ii. Theory of Operation
 - iii. Block Diagram
 - iv. Location
 - v. Remove and Install
- H. Engine Concentrator Unit (ECU)
 - i. Description
 - ii. Theory of Operation
 - iii. Block Diagram
 - iv. Location
 - v. Remove and Install
- I. Remote Data Concentrator (RDU)
 - i. Description
 - ii. Theory of Operation
 - iii. Block Diagram
 - iv. Location
 - v. Remove and Install
- J. EFIS Overview
 - i. Video – Touch Screen Interface
- K. Cursor Control Panel (CCP)
 - i. Video – Cursor Control Panel
 - ii. Description
 - iii. Theory of Operation
 - iv. Location

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- v. Remove and Install
- vi. Student Exercise
- L. Multifunction Keyboard Panel (MKP)
 - i. Video – Multifunction Keyboard Panel
 - ii. Description
 - iii. Theory of Operation
 - iv. Location
 - v. Remove and Install
 - vi. Student Exercise
- M. Barometric Single Knob Panel (BSKP) and Tilt Single Knob Panel (TSKP)
 - i. Video – BARO Set – Radar Tilt Knobs
 - ii. Description
 - iii. Theory of Operation
 - iv. Location
 - v. Remove and Install
 - vi. Troubleshoot
- N. Aircraft Personality Module (APM)
 - i. Description
 - ii. Theory of Operation
 - iii. Location
 - iv. Remove and Install
 - v. Troubleshoot
- O. Electronic Flight Instrument System (EFIS)
 - i. Overview
 - ii. System Bus Diagram
 - iii. System Block Diagram
 - iv. Description

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- v. Theory of Operation
- vi. PFD Formats
 - 1. Example – Full Window/Half Window, Format Menus
- vii. Cautions and Safety Touch Screen
- viii. Cursor Control
- ix. Remove and Install
- x. Troubleshoot
- xi. Student Exercises

6. Chapter 34 - Navigation

- A. Overview
- B. Air Data System [34-10]
 - i. Air Data Computer
 - ii. Description
 - iii. Theory of Operation
 - iv. Block Diagram
 - v. Location
 - vi. Remove and Install
- C. Attitude Heading Reference System [34-20]
 - i. Attitude Heading Computer (AHC)
 - ii. Flux Detector Unit (FDU)
 - iii. External Compensation Unit (ECU)
 - iv. Description
 - v. Theory of Operation
 - vi. Block Diagram
 - vii. Location
 - viii. Remove and Install
- D. Enhanced Vision System (EVS) [34-30] **Optional**

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- i. Infrared Camera
 - ii. Adaptive Flight Display (AFD)
 - iii. Cockpit Controls
 - iv. Surface Awareness - **Optional**
 - v. Student Exercise
 - vi. Description
 - vii. Theory of Operation
 - viii. Block Diagram
 - ix. Location
 - x. Remove and Install
- E. Synthetic Vision System (SVS) [34-32] **Optional**
- i. Software Vision Key
 - ii. Software Tables
 - iii. Description
 - iv. Theory of Operation
 - v. Block Diagram
 - vi. Location
 - vii. Remove and Install
- F. Weather Radar System [34-40]
- i. Tilt Single Knob Panel (TSKP)
 - 1. Video – BARO Set and Radar Tilt Knobs
 - ii. Receiver/Transmitter Antenna (RTA-852)
 - 1. Description
 - 2. Theory of Operation
 - 3. Block Diagram
 - iii. Receiver/Transmitter Antenna (RTA-4112) **Optional**
 - 1. Description

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- 2. Theory of Operation
- 3. Block Diagram
- iv. Location
- v. Remove and Install
- G. Radio Altimeter System [34-42]
 - i. Radio Altimeter Transceiver
 - ii. Radio Altimeter Antenna
 - iii. Description
 - iv. Theory of Operation
 - v. Block Diagram
 - vi. Location
 - vii. Remove and Install
- H. Traffic Alert and Collision Avoidance System II (TCAS II) [34-43]
 - i. TCAS Receiver/Transmitter
 - ii. TCAS Directional Antenna
 - iii. Description
 - iv. Theory of Operation
 - v. Block Diagram
 - vi. Location
 - vii. Remove and Install
- I. Integrated Terrain Awareness Warning System (ITAWS) [34-47]
 - i. Theory of Operation
 - ii. ITAWS Displays
- J. Global Navigation Satellite System (GNSS) [34-52]
 - i. GPS Receiver
 - ii. GPS Antenna
 - iii. Description

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- iv. Theory of Operation
- v. Block Diagram
- vi. Location
- vii. Remove and Install
- K. VHF Navigation and ADF [34-53]
 - i. VHF Navigation Description
 - ii. Theory of Operation
 - iii. Block Diagram
 - iv. Location
 - v. Remove and Install
 - vi. ADF Description
 - vii. Theory of Operation
 - viii. Block Diagram
 - ix. Location
 - x. Remove and Install
- L. Distance Measuring Equipment (DME) [34-54]
 - i. Description
 - ii. Theory of Operation
 - iii. Block Diagram
 - iv. Location
 - v. Remove and Install
- M. ATC Transponder [34-55]
 - i. Description
 - ii. Theory of Operation
 - iii. Block Diagram
 - iv. Location
 - v. Remove and Install

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N. Flight Management System (FMS) [34-60]

- i. Description
- ii. Theory of Operation

7. Chapter 44 – Cabin Systems

A. Video Surveillance System **Optional**

8. Chapter 45 – Central Maintenance System (CMS)

- A. Overview
 - i. Video – Onboard Maintenance System (OMS)
- B. Onboard Maintenance System Application
- C. Onboard Maintenance System Table
- D. Theory of Operation
- E. Onboard Diagnostics
- F. Configuration
- G. Reporting
- H. Database Management
- I. Data Load
 - i. Video – Data Loading
- J. Troubleshoot

9. Chapter 46 – System Integration and Display

- A. Overview
- B. File Server Application
- C. Data Link Weather Key
- D. Electronic Charts Key
- E. Enhanced Maps Overlay Key
- F. Outboard IFIS Key
- G. XM Weather Receiver

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H. Information Management System (IMS)

10. Chapter 77- Engine Indicating and Crew Alert System (EICAS)

- A. Overview
- B. EICAS Application
- C. Cockpit Controls

11. Chapter 31-60 Dataloading

12. Summary – Review

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EQUIPMENT TYPE:

EQUIPMENT	NOMENCLATURE	PART NUMBER
ATA 22-10-00	Flight Guidance System	
FGC-3000	Flight Guidance Computer	822-1108-147 (C90GTi) 822-1108-131 (B200) 822-1108-132 (B300)
FGP-3000	Flight Guidance Panel	822-1107-103
SVO-3000	Aileron Servo	822-1168-001 (C90GTi) 822-1168-002 (B200) (B300)
SVO-3000	Elevator Servo	822-1168-002 (All)
SVO-3000	Rudder Servo	822-1168-002 (C90GTi) (B200)
SVO-85B	Rudder Servo	622-5027-101 (B300)
SVO-3000	Elevator Trim Servo	822-1168-003 (All)
SMT-65	Aileron Servo Mount	622-5735-001 (C90GTi) 622-5735-002 (B200) (B300)
SMT-65	Elevator Servo Mount	622-5735-001 (B200) (B300) 622-5735-002 (C90GTi)
SMT-65	Rudder Servo Mount	622-5735-002 (C90GTi) (B200)
SMT-85B	Rudder Servo Mount	622-5029-102 (B300)
SMT-65	Elevator Trim Servo Mount	622-5735-002 (B200) (B300)
SMT-65D	Elevator Trim Servo Mount	622-6411-002 (C90GTi)

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ATA 23-10-00 HF Communications System		
HF-9031A	HF Transceiver (Optional)	822-0101-002
HF-9041	HF Antenna Coupler (Optional)	622-8114-002
FL-9003	HF Feedline Adapter (Optional)	685-0355-001
ATA 23-11-00 VHF Communications System		
VHF-4000	VHF Comms Transceiver - 8.33kHz	822-1468-102, -110
ATA 23-20-00 VHF Data Link System		
VHF-4000	VHF Comms Transceiver – 8.33kHz Data Link (Optional)	822-1468-310
CMU-4000	Communications Management Unit (Optional)	822-1739-003 (Rel. 2)
ECU-3000	External Compensation Unit Unprogrammed	822-1200-997 (Rel.2) 822-1200-996 (Rel. 3/4)
GWXK-6200	Software – Graphical Weather Access Key	810-0369-100 (Rel. 3/4)
ATA 23-50-00 VHF Data/Audio System		
RIU-4010	Radio Interface Unit – Aural Alerts and Datalink	822-1863-642 (Rel. 3) 822-1863-644 (Rel. 4)
RIU-4010	Radio Interface Unit – Aural Alerts, Datalink and SELCAL decoding	822-1863-641 (Rel. 3) 822-1863-643 (Rel. 4)
RIU-4110	Radio Interface Unit – Aural Alerts	822-1864-242 (Rel. 3) 822-1864-244 (Rel. 4)
RIU-4110	Radio Interface Unit – Aural Alerts and SELCAL decoding	822-1864-241 (Rel. 3) 822-1864-243 (Rel. 4)
ATN-6200	Software – ATN ATC Datalink	810-0187-100 (Rel. 3/4)
FPLK-6200	Software – Enable 702A Messages Key	810-0368-100 (Rel. 3/4)
ATA 31-40-00 Integrated Avionics Processor System		

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ICC-3000	Integrated Card Cage	822-1129-001 (Rel. 2/3)
ICC-3110	Integrated Card Cage	822-2190-001 (Rel. 4)
IEC-3001	IAPS Environmental Controller	822-1167-001
IOC-3100	Input/Output Concentrator	822-1361-621 (Rel. 2) 822-1361-622 (Rel. 3/4) 822-1361-623 (Rel. 4)
PWR-3000	Power Supply Module	822-1137-001
CSU-3100	Configuration Strapping Unit	822-1363-002
OCM-3100	Option Control Module	822-1484-200
ATA 31-41-00 Data Concentration System		
DCU-3001	Data Concentrator Unit	822-1483-102
RDC-4002	Remote Data Concentrator	822-1533-301
ATA 31-60-00 Electronic Flight Instrument System		
AFD-3700	Adaptive Flight Display	822-3065-001
CCP-3500	Cursor Control Panel	822-2754-010
MKP-3500	Multifunction Keyboard Panel	822-2568-010
APM-5000	Aircraft Personality Module	822-2195-001
SKP-3500	Baro Single Knob Panel	822-3163-010
AFDR-3700	Software – Adaptive Flight Display Runtime	810-0346-001 (Rel. 2) 810-0346-002 (Rel. 3) 810-0346-003 (Rel. 4)
ECDA-6000	Software – Emulated Control Display Application	810-0233-100
FDSA-6500	Software – Flight Display System Application	810-0234-1H0002 (Rel.2) 810-0234-1H0003 (Rel.3) 810-0234-1H0006 (Rel.4)
PMA-6000	Software – Protocol Manager Application	810-0192-100

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RTSA-6000	Software – Radio Tuning System Application	810-0048-701 (Rel. 2) 810-0048-702 (Rel. 3/4)
APCT-3700	Software – Airframe Parameter Configuration Table	810-0422-002 (Rel. 2) 810-0422-003 (Rel. 3)
APCT-3700	Software – Airframe Parameter Configuration Table (Retrofit Only)	810-0422-007 (Rel. 4)
APCT-3700	Software – Airframe Parameter Configuration Table (B300 with Steep Approach capability only)	810-0422-200 (Rel. 3)
APCT-3700	Software _ Airframe Parameter Configuration Table (OEM/Forward Fit with Cabin Pressurization and Flaps Indication Display)	810-0422-204 (Rel. 4)
IMAT-3700	Software – Integrated Modular Avionics Table	810-0352-002 (Rel. 2) 810-0352-004 (Rel. 3/4)
AFD-3700	Software – AFD Field Test	831-9563-001A
ATA 34-10-00 Air Data System		
ADC-3010	Air Data Computer	822-2083-002 (C90GTI)
ACT-3010	Aircraft Configuration Table	810-0044-009
ADC-3000	Air Data Computer	822-1109-026 (B200) 822-1109-027 (B300) 822-1109-028 (B300ER)
ATA 34-20-00 Attitude Heading Reference System		
AHC-3000	Attitude Heading Computer	822-1110-002
FDU-3000	Flux Detector Unit	822-1193-001
ECU-3000	External Compensation Unit	822-1200-002
ATA 34-31-00 Surface Awareness		
Tlaf-5000	Software – Take-off and Landing Awareness Function Key	810-0165-001

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ATA-34-32-00 Synthetic Vision System		
ATF-3500	Software – Advanced Terrain Functions	810-0348-001
ATFT-3500	Software – Advanced Terrain Functions Table	810-0385-1H0001
ATF-3510	Software – Advanced Terrain Functions	810-0391-001 (Rel. 3) 810-0391-004 (Rel. 4)

ATA 34-40-00 Weather Radar System		
SKP-3500	Tilt Single Knob Panel	822-3163-020
RTA-852	Weather Radar Receiver Transmitter Antenna	622-8439-004
RTA-4112	MultiScan WXR (Optional)	822-2254-001 (Rel. 3/4)
WXRK-4001	Software – Weather Radar MultiScan Key (Optional)	810-0267-001 (Rel. 3/4)
ATA 34-42-00 Radio Altimeter System		
ALT-4000	Radio Altimeter	822-0615-206
ATA 34-43-00 Traffic Alert & Collision Avoidance System II		
TTR-4100	TCAS Receiver/Transmitter (Optional)	822-3075-001
TRE-920	TCAS Directional Antenna	622-8973-001
ATA 34-47-00 Integrated Terrain Awareness Warning System (ITAWS)		
TAWK-3510	Software – ITAWS Key	810-0571-001
ATA 34-52-00 Global Navigation Satellite System		
GPS-4000S	Global Positioning System, SBAS Capable	822-2189-010/100
ATA 34-53-00 VHF Navigation System		
NAV-4000	VOR/ILS/MB/ADF Receiver	822-1465-001

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NAV-4500	VOR/ILS/MB Receiver (Optional)	822-1579-001
ANT-462A	Single ADF Antenna	622-7383-001
ANT-462B	Dual ADF Antenna (C90GTi)	622-7384-002
ATA 34-54-00 Distance Measuring Equipment		
DME-4000	DME Transceiver	822-1466-001
ATA 34-55-00 Air Traffic Control Transponder System		
TDR-94D	Diversity Transponder	622-9210-501

ATA 34-60-00 Flight Management System		
FMSA-6010	Software – Flight Management System Application	810-0163-1H0004 (Rel. 2)
FMSA-6010	Software – Flight Management System Application	810-0163-1R0001 (Rel. 3/4)
SARK-3500	Software – FMS Search and Rescue Key (Optional)	810-0387-001
RNP-6000	Software Key – FMS RNP SAAR ≥ 0.30 (Optional)	810-0201-001 (Rel. 3/4)
ATA 44-50-00 Video Surveillance System		
VID-3500	Software – Video Key (Optional)	810-0392-001
ATA 45-20-00 Onboard Maintenance System		
OMSA-6000	Software – Onboard Maintenance System Application	810-0106-250 (Rel. 2) 810-0106-251 (Rel. 3/4)
OMST-6000	Software – Onboard Maintenance System Table	810-0099-1H0002 (Rel.2) 810-0099-1H0003 (Rel.3) 810-0099-1H0004 (Rel.4)
ODLA-3500	Software – Onboard Data Loader Application	810-0345-1H0001

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		(Rel. 2) 810-0345-1R0001 (Rel 3/4)
ATA 46-20-00 Integrated Flight Information System		
FSA-6000	Software – File Server Application	810-0072-302 (Rel. 2/3) 810-0072-304 (Rel. 4)
DLWX-3500	Software – Data Link Weather Key (Optional)	810-0353-001
ECH-3500	Software – Electronic Charts Key (Optional)	810-0361-001
OVL-3500	Software – Enhanced Map Overlay Key (Optional)	810-0360-001
FSAX-3500	Software – Outboard IFIS Key (Optional)	810-0354-001
CHTX-3500	Software – Chart Extension Key (Optional)	810-0476-001
ATA 46-21-00 XM/SXM Weather		
XMWR-1000	XM Weather Receiver (Optional)	822-2031-003 (Rel. 2/3)
SXMWR-1000S	SXM Weather Receiver (Optional)	822-3365-001 (Rel. 4)
XMWX-3500	Software – XM/SXM Weather Key (Optional)	810-0355-001
ATA 46-30-00 Information Management System		
IMSA-3500E	Software – Information Management System Applications (Optional)	810-0414-001 (Rel. 2) 810-0414-201 (Rel. 3/4)
IMSOS-3500E	Software – Information Management System Operating Software (Optional)	810-0415-001
IMS-3500	Information Management System (Optional)	822-2999-101 (Rel. 2) 822-2999-201 (Rel. 3/4)
COTS	USB Wi-Fi Adapter - Raspberry Pi	983-9844-112 (Rev. 3/4)

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ATA 77-40-00 Engine Indication & Crew Alert System		
EICAS-6000	Software – EICAS Application	810-0245-1H0003 (Rel.2) 810-0245-1H0010 (Rel.3) 810-0245-1H0025 (Rel.4)