

Publications and Training Solutions

Course Syllabus: 523-0809133

COURSE TITLE: Pro Line 21 King Air C90GTi
Level I 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 flightline maintenance for the Pro Line 21 System.
The Pro Line 21 System consists of the line replaceable units (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 Pro Line 21 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 Test Diagnostics.

COURSE LENGTH: 5 Days

TRAINING DEVICES:

1. Special Test Equipment
 - a. King Air Test Rig, Cedar Rapids (if available)

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TRAINING MATERIALS:

1. PowerPoint Presentation with LCD/Box Light projector
2. Student Guide – Flash drive (pdf) – Training Presentation
Information Sheets
3. Beechcraft King Air C90GTi/B200GT ASM Excerpt 523-0808533
4. Beechcraft King Air C90GTi/B200GT DG 523-0808534

REFERENCES:

1. Beechcraft King Air C90GTi/B200GT Avionics System Manual 523-0808533
2. Beechcraft King Air C90GTi/B200GT Diagnostic Guide 523-0808534
3. Beechcraft King Air C90GTi/B200GT Operator's Guide 523-0808535

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COURSE OUTLINE

0. Welcome & Introductions

- A. Course Overview
 - i. Welcome
 - ii. Student Registration

1. Introduction to Materials and Handouts

- A. System Manual Introduction and Use
- B. Diagnostic Guide Introduction
- C. Equipment Description
 - i. Business & Regional Systems Equipment – Leading Particulars

2. Data Bus

- A. Why We Use Data Buses
- B. ARINC Data Buses
 - i. ARINC 429
 - ii. ARINC 453

3. Integrated Avionics Processing System (IAPS)

- A. Overview
- B. System Architecture
- C. Integrated Card Cage (ICC)
 - i. Description
 - ii. Theory of Operation
- D. Power Supply Module (PWR)
 - i. Description
 - ii. Theory of Operation
- E. IAPS Environmental Controller (IEC)
 - i. Description
 - ii. Theory of Operation

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- F. Input/Output Concentrator (IOC)
 - i. Description
 - ii. Theory of Operation
- G. Maintenance Diagnostic Computer (MDC)
 - i. Description
 - ii. Theory of Operation
- H. Configuration Strapping Unit (CSU)
 - i. Description
 - ii. Theory of Operation
- I. Detailed Functional Theory
 - i. IAPS Power Distribution
 - ii. Temperature Monitoring
 - iii. Overheat Reporting
 - iv. Power Supply Inhibit
 - v. CSU Detailed Theory
- J. Maintenance and Troubleshooting
 - i. PWR Fault Indications
 - ii. IEC Fault Indications
 - iii. Status Messages
 - iv. Diagnostics

4. Maintenance Diagnostics

- A. Overview
- B. Maintenance Diagnostic Computer (MDC)
 - i. Description
 - ii. Theory of Operation
 - iii. Operation

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5. Electronic Flight Instrument System (EFIS)

- A. Overview
- B. Adaptive Flight Display (AFD)
 - i. Primary Flight Display (PFD)
 - 1. Description
 - 2. Theory of Operation
 - 3. Reversionary Mode Select
 - ii. Multifunction Display (MFD)
 - 1. Description
 - 2. Theory of Operation
 - 3. Reversionary Mode Select
 - iii. Reversion Switch Panel (RSP)
 - 1. RSP Switchology Description
 - 2. Operation
 - 3. Detailed Theory of Operation

6. Integrated Flight Information System (IFIS)

- A. Overview
 - i. System Description
- B. File Server Unit (FSU)
 - i. Description
 - ii. Theory of Operation
 - iii. Operation
 - 1. Enhanced Map Function
 - 2. Electronic Charts
 - 3. Graphical Weather

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- C. External Compensation Unit (ECU)
 - i. Description
 - ii. Theory of Operation
 - D. File Server Application Software (FSA)
 - i. Description
 - ii. Theory of Operation
 - E. Encrypted Application Key (EAK)
 - i. Programming EAK's
 - F. Electronic Charts Region Access Keys
 - i. Programming Region Access Keys
 - G. Maintenance and Troubleshooting
 - H. Database Effective Dates
- 7. Engine Indicating System (EIS)**
- A. Overview
 - B. MFD
 - i. Display Synoptics
 - C. Data Concentrator Unit (CCU)
 - i. Description
 - ii. Integration Theory
 - iii. Theory of Operation
 - D. Engine Data Concentrator Unit (EDC)
 - i. Description
 - ii. Integration Theory
 - iii. Theory of Operation
 - E. Maintenance and Troubleshooting
 - i. Status Messages
 - ii. Diagnostics

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8. Air Data System (ADS)

- A. Overview
- B. Air Data Computer (ADC)
 - i. Description
 - ii. Theory of Operation
- C. Maintenance and Troubleshooting
 - i. Status Message
 - ii. Diagnostics

9. Attitude Heading System (AHS)

- A. Overview
- B. Attitude Heading Computer (AHC)
 - i. Description
 - ii. Theory of Operation
- C. Flux Detector Unit (FDU)
 - i. Description
 - ii. Theory of Operation
- D. External Compensation Unit (ECU)
 - i. Description
 - ii. Theory of Operation
- E. Maintenance and Troubleshooting
 - i. Diagnostics
 - ii. Post Installation Check
 - iii. Compass Compensation Procedure
 - iv. Automatic Leveling Procedure

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10. Flight Guidance System (FGS)

- A. Overview
- B. Flight Guidance Computers (FGC)
 - i. Description
 - ii. Theory of Operation
- C. Flight Guidance Panel (FGP)
 - i. Description
 - ii. FGP Switch Description
 - iii. Operation
 - iv. Theory of Operation
- D. Primary Servos (SVO)
 - i. Description
 - ii. Theory of Operation
- E. Autopilot and Yaw Damp Detailed Theory of Operation
 - i. Description of Fail Passive System
 - ii. Description of Null Seeking Servo Loops
 - iii. Description of Yaw Damp System
- F. Autopilot Diagnostics
 - i. Entering and Using Autopilot Diagnostics
 - 1. Input Mode
 - 2. Output Mode
 - 3. Report Mode

11. Flight Management System (FMS)

- A. Overview
- B. Flight Management Computer (FMC)
 - i. Description
 - ii. Theory of Operation

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- C. Control Display Unit (CDU)
 - i. Description
 - ii. Theory of Operation
- D. Data Base Unit (DBU)
 - i. Description
 - ii. Theory of Operation

12. Data Loading

- A. CPAS (Collins Portable Access Software) Database Loading
- B. PCD-3000 (Personal Computer Dataloader)
- C. DBU (Data Base Unit) Database Loading

13. Radio Sensor System (RSS)

- A. Overview
- B. GPS
 - i. Description
 - ii. Operation
 - iii. Theory of Operation
- C. VOR/ILS/MB/ADF Receiver (NAV)
 - i. Description
 - ii. Theory of Operation
- D. Distance Measuring Equipment (DME)
 - i. Description
 - ii. Theory of Operation
- E. VHF Comm Receiver/Transmitter (VHF)
 - i. Description
 - ii. Theory of Operation

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- F. Mode S Transponder (TDR-94D)
 - i. Description
 - ii. Theory of Operation
- G. High Frequency Receiver/Transmitter (HF)
 - i. Description
 - ii. Theory of Operation
- H. Radio Altimeter (ALT)
 - i. Description
 - ii. Theory of Operation
- I. Radio Tuning Operations
 - i. Description
 - ii. Operations
 - iii. Theory of Operation
- J. General Maintenance Procedures for Comm/Nav/Pulse Equipment
 - i. Flight Line Diagnostic Procedures
 - ii. Antenna Maintenance Considerations

14. Weather Radar (WXR)

- A. Overview
- B. Microwave Radiation Hazards
 - i. AC 20-68B
- C. Weather Radar Theory
- D. Receiver-Transmitter Assembly (RTA-8xx)
 - i. Description
 - ii. Operation
 - iii. Theory of Operation

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- E. Maintenance
 - i. Radome Maintenance (AC 43-13)
 - ii. Flight Line Diagnostic Procedures

15. Summary – Review - Critique

- A. Test
- B. Critiques

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EQUIPMENT TYPE:

EQUIPMENT	NOMENCLATURE	PART NUMBER
IAPS Card Cage	ICC-3000	822-1129-001
IAPS Environmental Controller	IEC-3001	822-1167-001
IAPS Power Supply	PWR-3000	822-1137-001
I/O Concentrator	IOC-3100	822-1361-613
Options Control Module	OCM-3100	822-1484-201
Configuration Strapping Unit	CSU-3100	822-1363-002
Maintenance Diagnostic Computer	MDC-3110	822-1987-005
Adaptive Flight Display (PFD, MFD)	AFD-3010	822-1084-353
Adaptive Flight Display (Ethernet)	AFD-3010E	822-1753-353
Display Control Panel	DCP-3030	822-1828-061, -161
File Server Unit	FSU-5010	822-1543-101
Cursor Control Panel	CCP-3000	822-1746-001
Communications Management Unit (Use with 3rd VHF data-link option)	CMU-4000	822-1739-003
XM Receiver	XMWR-1000	822-2031-002
External Compensation Unit (FSU)	ECU-3000	822-1200-998, -999
Data Concentrator Unit	DCU-3001	822-1483-102
Air Data Computer	ADC-3010	822-2083-002
Attitude Heading Computer	AHC-3000	822-1110-002
External Compensation Unit	ECU-3000	822-1200-002
Flux Detector Unit	FDU-3000	822-1193-001
Flight Guidance Computer B200	FGC-3000	822-1108-047
Flight Guidance Panel	FGP-3000	822-1107-103
Aileron Servo	SVO-3000	822-1168-001

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EQUIPMENT	NOMENCLATURE	PART NUMBER
Rudder Servo B200	SVO-3000	822-1168-002
Elevator Servo	SVO-3000	822-1168-002
Servo Mount (Aileron)	SMT-65	622-5735-001
Servo Mount (Rudder/Elevator)	SMT-65	622-5735-002
Flight Management Computer	FMC-3000	822-0883-025
Control Display Unit	CDU-3000	822-0884-493/491
Data Base Unit	DBU-5000	822-2215-201
ADF antenna, dual	ANT-462B	622-7384-001
Radio Altimeter	ALT-4000	822-0615-206
Distance Measuring Equipment	DME-4000	822-1466-001
Global Positioning System	GPS-4000A	822-1377-001
HF Transceiver	HF-9031A	822-0101-002
HF Antenna Coupler	HF-9041	685-0350-002
VHF Navigation Receiver	NAV-4000	822-1465-101
VHF Navigation Receiver	NAV-4500	822-1579-101
Radio Tuning Unit	RTU-4200	822-0668-251, -261
Radio Tuning Unit (TCAS)	RTU-4220	822-0730-461
Mode S Transponder (Baseline)	TDR-94	622-9352-005
Mode S Transponder (Diversity)	TDR-94	622-9532-008
VHF Communication Transceiver	VHF-4000	822-1468-102
VHF Communication Transceiver (Optional 3rd - Datalink)	VHF-4000	822-1468-302
Receiver/Transmitter/Antenna	RTA-800	822-1050-004
Receiver/Transmitter/Antenna (12 inch with Turbulence Detection)	RTA-852	622-8439-004