

Publications and Training Solutions

Course Syllabus: 523-0808172

COURSE TITLE: Cessna Citation ENCORE+ Pro Line 21
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.

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

The Pro Line 21 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 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 Maintenance Diagnostics.

COURSE LENGTH: 5 Days

TRAINING DEVICES:

1. Special Test Equipment
 - a. Cessna Citation 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. Cessna ENCORE+ Avionics System Diagnostic Guide 523-0807931

REFERENCES:

1. Cessna ENCORE+ Avionics System Manual 523-0807930
2. Cessna ENCORE+ Avionics System Diagnostic Guide 523-0807931
3. Cessna ENCORE+ Operator's Guide 523-0808124

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COURSE OUTLINE

0. Welcome & Introductions

- A. Course Overview
 - i. Welcome
 - ii. Student Registration
- B. Course Description and Objectives

1. Data Bus

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

2. Integrated Avionics Processing System (IAPS)

- A. Overview
- B. System Architecture
- C. Integrated Card Cage (ICC)
- D. Power Supply Module (PWR)
- E. IAPS Environmental Controller (IEC)
- F. Input/Output Concentrator (IOC)
- G. Maintenance Diagnostic Computer (MDC)
- H. Configuration Strapping Unit (CSU)
- I. Detailed Functional Theory
 - i. IAPS Power Distribution
 - ii. Temperature Monitoring
 - iii. Overheat Reporting
 - iv. Power Supply Inhibit
 - v. CSU Detailed Theory

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- J. Maintenance and Troubleshooting
 - i. PWR Fault Indications
 - ii. IEC Fault Indications
 - iii. Status Messages
 - iv. Diagnostics
- 3. Electronic Flight Instrument System (EFIS)**
 - A. Overview
 - B. Adaptive Flight Display
 - i. Primary Flight Display (PFD)
 - ii. Multifunction Display (MFD)
 - C. Display Control Panel (DCP)
- 4. Maintenance Diagnostics**
 - A. Overview
 - B. Maintenance Diagnostic Computer (MDC)
- 5. Integrated Flight Information System (IFIS)**
 - A. Overview
 - B. File Server Unit (FSU)
 - i. File Server Applications
 - ii. External Compensation Unit (ECU)
 - 1. Electronic Access Keys (EAK) Codes
 - iii. Graphical Weather
 - iv. Jeppesen Charts
 - v. Enhanced Map Overlays
 - vi. Controls and Indications

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6. Engine Indicating System (EIS)

- A. Overview
- B. Data Concentrator Unit (DCU)
- C. EIS/MFD Indications
 - i. Normal
 - ii. Transient
 - iii. Redline
 - iv. Compressed
 - v. Comparators

7. Air Data System (ADS)

- A. Overview
- B. Air Data Computer (ADC)
- C. Maintenance and Troubleshooting
 - i. PFD Red Flags
 - ii. PFD Source Reversion
 - iii. Diagnostics

8. Attitude Heading System (AHS)

- A. Overview
- B. External Compensation Unit (ECU)
- C. Flux Detector Unit (FDU)
- D. Modes of Operation
 - i. Normal Mode
 - ii. Basic Mode
 - iii. Slaved Mode
 - iv. DG Mode

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- E. Maintenance and Troubleshooting
 - i. Diagnostics
 - ii. Post Installation Check
 - iii. Compass Compensation Procedure
 - iv. Automatic Leveling Procedure

9. Flight Guidance System (FGS)

- A. Overview
- B. Flight Guidance Computers (FGC)
- C. Autopilot Panel (APP)
- D. Mode Select Panel (MSP)
- E. Primary Servos (SVO)
- F. FGS Operation
 - i. Dual Flight Guidance
 - ii. FGS Controls
- G. Autopilot and Yaw Damper
- H. Flight Guidance Diagnostics
 - i. Entering and Using Flight Guidance Diagnostics
 - 1. Report Mode
 - 2. Input Mode
 - 3. Output Mode
 - ii. Annunciator Indications
 - iii. Exiting Diagnostics

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10. Flight Management System (FMS)

- A. Overview
- B. Flight Management Computer (FMC)
- C. Control Display Unit (CDU)
- D. Wide Area Augmentation System (WAAS)
- E. Flight Management Data Base Operations
 - i. 28 Dat Database Load Procedure

11. Radio Sensor System (RSS)

- A. Overview
- B. Radio Tuning Unit (RTU)
- C. VHF Comm Receiver/Transmitter (VHF)
 - i. Datalink/CPDLC/Link 2000+
- D. VOR/ILS/MB/ADF Receiver (NAV)
- E. Distance Measuring Equipment (DME)
- F. Mode S Transponder (TDR-94D) with TCAS
- G. Radio Altimeter (ALT)
- H. Maintenance and Troubleshooting

12. Data Loading

- A. CPAS (Collins Portable Access Software) Database Loading
- B. DBU-5000 Operations

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13. Weather Radar (WXR)

- A. Overview
- B. Receiver/Transmitter Assembly (RTA)
- C. Display Control Panel (DCP)
- D. Weather Radar Fundamentals
- E. Maintenance and Troubleshooting
 - i. Radome Maintenance
 - ii. Flight Line Diagnostic Procedures

14. Summary – Review - Critique

- A. Test
- B. Critiques

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EQUIPMENT TYPE:

EQUIPMENT	NOMENCLATURE	PART NUMBER
IAPS Card Cage	ICC-3011	822-2119-001
IAPS Environmental Controller	IEC-3111	822-1167-001
IAPS I/O Concentrator	IOC-3100	822-1361-440
IAPS Power Supply	PWR-3000	822-1137-001
Configuration Strapping Unit	CSU-3100	822-1363-002
Options Control Module	OCM-3100	822-1484-XXX
Maintenance Diagnostic Computer	MDC-3110	822-1987-005
Maintenance Diagnostic Tables	MDT-3110	810-0042-XXX
Radio Altimeter	ALT-4000	822-0615-202
Adaptive Flight Display (PFD)	AFD-3010	822-1084-124
Adaptive Flight Display (MFD)	AFD-3010E	822-1753-124
Cursor Control Panel	CCP-3000	822-1746-102
Display Control Panel	DCP-3030	822-1828-XXX
Course/Heading Panel	CHP-3000	822-1279-002
Course Knob Panel	CKP-3000	822-1281-002
File Server Unit	FSU-5010	822-1543-101
File Server Application Software	FSA-5000	810-0001-008
External Compensation Unit (used with FSU-5010)	ECU-3000	822-1200-998
Graphical Weather (HUT/XM)	GWX-3001	810-0007-001
Optional Graphical Weather (Universal)	GWX-5000	810-0004-001
XM Receiver	XMWR-1000	822-2031-001
Electronic Charts	ECH-5000	810-0002-001
Map Overlays	OVL-5000	810-0003-001
Collins Portable Access Software (CPAS)	CPAS-3000	810-0032-003

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EQUIPMENT	NOMENCLATURE	PART NUMBER
Data Concentration Unit	DCU-3001	822-1483-270
Air Data Computer	ADC-3000	822-1109-123
Attitude Heading Computer	AHC-3000	822-1110-002
External Compensation Unit	ECU-3000	822-1200-003
Flux Detector Unit	FDU-3000	822-1193-001
Flight Guidance Computer Module	FGC-3000	822-1108-040
Autopilot Panel	APP-85	622-6208-223
Mode Select Panel	MSP-85	622-6209-020
Primary Servo (Aileron, Elevator, & Rudder)	SVO-3000	822-1168-XXX
Servo Mount	SMT-65	622-5735-XXX
Flight Management Computer Module	FMC-3000	822-0883-038
Control Display Unit	CDU-3000	822-0884-364
WAAS/LPV Global Positioning System Receiver	GPS-4000A/S	822-2189-001
Database Unit	DBU-5000	822-2215-002
VHF Comm Receiver-Transmitter	VHF-4000	822-1468-XXX
DME Receiver-Transmitter	DME-4000	822-1466-001
ADF Antenna (Single)	ANT-462A	622-7383-001
VHF Navigation Receiver (VOR/ILS/MB)	NAV-4500	822-1579-001
VHF Navigation Receiver (VOR/ILS/MB/ADF)	NAV-4000	822-1465-101
Radio Tune Unit	RTU-4220	822-0730-442
Mode-S Transponder (Diversity, Use with TCAS)	TDR-94D	622-9210-XXX
TCAS II Directional Antenna	TRE-920	622-8973-001

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EQUIPMENT	NOMENCLATURE	PART NUMBER
TCAS II Transmitter Receiver	TTR-4000	822-1294-002
Radio Interface Unit	RIU-4110	822-1864-XXX
Radio Interface Unit (with CMU option for Datalink option)	RIU-4010	822-1863-XXX
Audio Control Panel	ACP-4110	822-1861-030
External Compensation Unit (used with RIU-4010)	ECU-3000	822-1200-997
Receiver/Transmitter Antenna	RTA-800	822-1050-004
Receiver/Transmitter Antenna with turbulence detection	RTA-852	622-8439-004
HF receiver-transmitter	HF-9031A	822-0101-002
Feed Line for HF-9031A	FL-9003	685-0355-001
HF Antenna Coupler	HF-9041	622-8114-002