Publications and Training Solutions
Course Syllabus: 523-0817640

COURSE TITLE: Cessna Citation CJ-4 Pro Line 21 Avionics System
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 Pro Line 21 avionics system. This course is designed to teach troubleshooting for box replacement and does not include internal maintenance of any component.

OBJECTIVES: Upon completing this course, the student should 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 line replaceable unit (LRU).
3. Identify typical aircraft system interface and system architecture.
4. Perform fault isolation to a faulty LRU using built-in maintenance diagnostics.

COURSE LENGTH: 5 Days

TRAINING DEVICES:

Cessna Citation Test Rig, Cedar Rapids (if available)

TRAINING MATERIALS:

1. PowerPoint Presentation
2. Student Training Manual
3. Information Handouts

REFERENCES:

1. Cessna Citation CJ4 Avionics System Manual   523-0809084
2. Pro Line 21 Avionics System with IFIS for the Cessna Citation CJ4
   Operator Guide   523-0809086
3. Cessna Citation CJ4 Avionics System Diagnostic Guide   523-0809085

Publications and Training Solutions
Course Syllabus: 523-0817640

COURSE OUTLINE

0. **Welcome & Introductions**

   A. Training Overview

      i. Welcome

      ii. Student Registration

      iii. Student Policies and Procedures

   B. Course Description and Objectives

   C. Equipment Description

1. **Data Buses**

   A. Why we use Data Buses

   B. ARINC Data Buses

      i. ARINC 429

      ii. ARINC 435

2. **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 Internal Environmental Controller (IEC)

      i. Description

      ii. Theory of Operation

F. Maintenance Diagnostic Computer (MDC)

    i. Description

    ii. Theory of Operation

G. Configuration Strapping Unit (CSU)

    i. Description

    ii. Theory of Operation

H. Detailed Functional Theory

    i. IAPS Power Distribution

    ii. Temperature Monitoring

    iii. Overheat Reporting

    iv. Power Supply Inhibit

    v. CSU Detailed Theory

I. Maintenance and Troubleshooting

    i. PWR Fault Indications

    ii. IEC Fault Indications

    iii. Status Messages

    iv. Diagnostics

3. **Maintenance Diagnostics**

A. Maintenance Diagnostics Computer (MDC)

    i. Description

    ii. Theory of Operation

    iii. Operation

4. **Electronic Flight Instrument System (EFIS)**

A. Overview

B. Adaptive Flight Displays (AFD)

    i. Primary Flight Display (PFD)

        1. Description

        2. Theory of Operation

    ii. Multifunction Display (MFD)

        1. Description

        2. Theory of Operation

    iii. Display Control Panel (DCP)

        1. DCP Switchology Description

        2. Operation

        3. Detailed Theory of Operation

5. **Integrated Flight Information System (IFIS)**

    A. Overview

    B. File Server Unit (FSU)

        i. Description

        ii. Theory of Operation

        iii. Operation

            1. Enhanced Map Functions

            2. Electronic Charts

            3. Graphical Weather

    C. External Compensation Unit

        i. Description

        ii. Theory of Operation

    D. File Server Application Software (FSA)

        i. Description of Applications

        ii. Theory of Operation

    E. Encrypted Application Key (EAK)

        i. Programming EAKs

F. Electronic Charts Region Access Keys

    i. Programming Region Access Keys

G. Maintenance and Troubleshooting

    i. Database Effective Dates

6. **Engine Indicating System (EIS)**

A. Overview

B. Data Concentrator Unit (DCU)

    i. Description

    ii. Integration

    iii. Theory of Operation

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

    i. Description

    ii. Theory of Operation

C. Maintenance and Troubleshooting

    i. PFD Red Flags

    ii. PFD Source Reversion

    iii. Diagnostics

8. **Attitude Heading System (AHS)**

A. Overview

B. Attitude Heading Computer (AHC)

    i. Description

    ii. Theory of Operation

C. External Compensation Unit (ECU)

    i. Description

    ii. Theory of Operation

D. Flux Detector Unit (FDU)

    i. Description

    ii. Theory of Operation

E. Modes of Operation

    i. Normal Mode

    ii. Basic Mode

    iii. Slaved Mode

    iv. DG Mode

F. 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)

    i. Description

    ii. Theory of Operation

C. Flight Guidance Panel (FGP)

       i.   Description

       ii.   Mode Description

       iii.   Operation

       iv.   Theory of Operation

D. Primary Servos (SVO)

       i.   Description

       ii.   FGS Controls

E. FGS Operation

       i.   Dual Flight Guidance

       ii.   FGS Controls

F. Autopilot and Yaw Damper

       i.   Description of Fail Passive Autopilot System

       ii.   Theory of Operation

10. **Flight Management System (FMS)**

A. Overview

B. Flight Management Computer (FMC)

       i.   Description

       ii.   Theory of Operation

C. Control Display Unit (CDU)

       i.   Description

       ii.   Theory of Operation

D. Data Base Unit

       i.   Description

       ii.   Theory of Operation

E. Flight Management Data Base Operations

       i.   28 Day Data Base Load

11.Database Loading Operations

    A. Overview

        i.   Description

    B. Data Base Unit (DBU)

        i.   Description

        ii.   Theory of Operation

        iii.   Operation

            1.   Uploading Databases

            2.   Downloading Data

12.Radio Sensor System

    A. Overview

    B. Radio Interface Unit

        i.   Description

        ii.   Theory of Operation

    C. VHF Comm Receiver/Transmitter (VHF)

        i.   Description

        ii.   Theory of Operation

        iii.   Datalink/CPDLC/Link 2000+

    D. VOR/ILS/MB/ADF Receiver (NAV)

        i.   Description

        ii.   Theory of Operation

    E. Distance Measuring Equipment (DME)

        i.   Description

        ii.   Theory of Operation

    F. Traffic Surveillance System (TSS-4100)

        i.   Description

          ii.   Theory of Operation

    G. Mode S Transponder (TDR-94D)

          i.   Description

          ii.   Theory of Operation

    H. Radio Altimeter (ALT)

          i.   Description

          ii.   Theory of Operation

    I. Maintenance and Troubleshooting

13. MultiScan^{TM} Weather Radar (WXR)

    A. Overview

    B. Receiver Transmitter Assembly (RTA)

          i.   Description

          ii.   Operation

          iii.   Theory of Operation

    C. MultiScan^{TM} Theory of Operation

          i.   MultiScan^{TM} Capabilities

          ii.   MulitScan^{TM} Technologies

    D. Weather Radar Fundamentals

    E. Maintenance

          i.   Radome Maintenance

          ii.   Flight Line Diagnostic Procedures

14. Course Conclusion

    A. Review

    B. Course Critique

Publications and Training Solutions
Course Syllabus: 523-0817640

EQUIPMENT TYPE:

EQUIPMENT	NOMENCLATURE	PART NUMBER
IAPS Card Cage	ICC–3111	822-2191-001
IAPS Environmental Controller	IEC-3001	822-1167-001
IAPS Power Supply	PWR–3000	822-1137-001
I/O Concentrator	IOC–4110	822-2065-001
Options Control Module	OCM-3100	822-1484-228
Maintenance Diagnostic Computer	MDC-3110	822-1987-006
Configuration Strapping Unit	CSU–3100	822-1363-002
Adaptive Flight Display (PFD, MFD)	AFD-3010	822-1993-100
Adaptive Flight Display (MFD)	AFD-3320	822-2349-100
Cursor Control Panel	CCP-3000	822-2434-100
Display Control Panel	DCP-3320	822–2433-100
Data Concentrator Unit	DCU-5010	822-1538-201
Air Data Computer	ADC–3000	822–1109-128
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	FGC-3000	822-1108-048
Flight Guidance Panel	FGP-3000	822-1107-136
Elevator, Rudder, Aileron Servo	SVO-3000	822-1168-022,023

Publications and Training Solutions
Course Syllabus: 523-0817640

EQUIPMENT	NOMENCLATURE	PART NUMBER
Control Display Unit	CDU-3000	822-0884-362
Flight Management Computer	FMC-6200	822-2248-xxx
Data Base Unit	DBU-5000	822-2215-602
File Server Unit	FSU-5010	822-1543-101
Radio Altimeter	ALT-4000	822-0615-206
Distance Measuring Equipment	DME-4000	822-1466-001
Global Positioning System Receiver	GPS-4000s	822-2189-001
HF Transceiver	HF-9031A	822-0101-002
HF Antenna Coupler	HF-9041	622-8114-002
VHF Navigation Receiver	NAV-4000	822-1465-001
VHF Navigation Receiver	NAV-4500	822-1579-001
Mode S Transponder	TDR-94D	622-9210-008
TCAS and Transponder Unit	TSS-4100	822-2132-001
VHF Communication Transceiver	VHF-4000	822-1468-302
Radio Interface Unit	RIU-4110	822-1864-022
Multiscan^{TM} Weather Radar	RTA-4112	822-2254-001