Publications and Training Solutions
Course Syllabus: 523-0807756

COURSE TITLE: Pro Line 21 Cessna CJ-1+, 2+, 3 Combo

PREREQUISITES:

1. Students should have a 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 ProLine 21 avionics principles and operations.
2. Identify system components and the functional / operations characteristics of each Line Replaceable Unit (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. Cessna CJ Series Aircraft (if available)
2. PL-21 CJ Test Rig, Cedar Rapids (if available)

TRAINING MATERIALS:

1. Student Training Manuals
2. Informational Handouts

REFERENCES:

3. Cessna Citation CJ1, CJ2 System Manual   523-0778454
1. Cessna Citation CJ1, CJ2 Diagnostic Guide   523-0778460
2. Cessna Citation CJ1, CJ2 Pilot Guide   523-0780351
3. Cessna Citation CJ1+, CJ2+, CJ3 System Manual   523-0806482
4. Cessna Citation CJ1+, CJ2+, CJ3 Diagnostic Guide   523-0806483
5. Cessna Citation CJ1+, CJ2+, CJ3 Pilot Guide   523-0806480

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COURSE OUTLINE

0. Welcome & Introductions

    A. Training Overview

    B. Welcome

    C. Student Registration

    D. Student Policies and Procedures

    E. Course Description and Objectives

    F. Equipment Description

1. Data Busses

    A. Why we use Data Buses

    B. ARINC Data Buses

    C. ARINC 429

    D. ARINC 453

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. 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

3. Maintenance Diagnostics

  A. Maintenance Diagnostic Computer (MDC)

         i. Description

        ii. Theory of operation

       iii. Operation

4. Electronic Flight Instrument System (EFIS)

  A. Overview

B. Adaptive Flight Display (AFD)

    i. Primary Flight Display (PFD)

    ii. Multifunction Display (MFD)

C. Display Control Panel (DCP)

    i. DCP switchology description

    ii. Operation

    iii. Detailed theory of operation

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

A. Overview

    i. System description

B. File Server Unit (FSU)

    i. Description

    ii. Theory of operation

    iii. Operation

C. External Compensation Unit (ECU)

    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 (ADC)

   C. Maintenance and troubleshooting

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. Autopilot Panel (APP)

      i. Description

      ii. APP switchology description

      iii. Operation

      iv. Theory of operation

   D. Mode Select Panel (MSP)

      i. Description

      ii. Theory of operation

   E. Primary Servos (SVO)

     i. Description

     ii. Theory of operation

  F. FGS Operation

     i. Dual Flight Guidance

     ii. FGS Controls

  G. 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 (DBU)

     i. Description

     ii. Theory of operation

  E. Flight Management Data Base operations

     i. 28 day database load

11. Database Loading Operations

  A. Overview

     i. Description

  B. Data Base Unit (DBU)

     i. Description

    ii. Theory of operation

    iii. Operation

C. Personal Computer Dataloader (PCD)

    i. Description

    ii. Theory of operation

    iii. Operation

D. Collins Portable Access Software (CPAS)

    i. Description

    ii. Theory of operation

    iii. Operation

12. Radio Sensor System (RSS)

A. Overview

B. Radio Tuning 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. Mode S Transponder (TDR-94D) with TCAS

         i.   Description

        ii.   Theory of operation

   G. Radio Altimeter (ALT)

         i.   Description

        ii.   Theory of operation

   H. Maintenance and Troubleshooting

13. Weather Radar (WXR)

   A. Overview

   B. Receiver Transmitter Assembly (RTA)

         i.   Description

        ii.   Operation

       iii.   Theory of operation

   C. Display Control Panel (DCP)

         i.   Description

        ii.   Operation

       iii.   Theory of operation

   D. Weather Radar Fundamentals

   E. Maintenance

         i.   Radome maintenance

        ii.   Flight line diagnostic procedures

14. Course Summary

   A. Review

   B. Summary

   C. Final Test

   D. Critique

EQUIPMENT TYPE:

EQUIPMENT	NOMENCLATURE	PART NUMBER
ICC–3XX1	IAPS Card Cage	822-1459-001
IEC-3001	IAPS Environmental Controller	822-1167-001
PWR–3000	IAPS Power Supply	822-1137-001
IOC–X1X0	I/O Concentrator	822-1130-101, -151, 822-2065-001, 822-1361-401, -403, -410
OCM-3100	Options Control Module	822-1484-2XX
MDC-3110	Maintenance Diagnostic Computer	822-1987-00X
CSU–3000	Configuration Strapping Unit	822–1128-001
CSU–3100	Configuration Strapping Unit	822-1363-002
AFD-3010	Adaptive Flight Display (PFD, MFD)	822-1084-102, -104, -108, -110, -120, -202, -206, -208, -506
AFD-3010E	Adaptive Flight Display (MFD)	822-1753-120, -506
CHP-3000	Course Heading Panel	822–1279-002
CKP-3000	Cursor Knob Panel	822–1281-002
CCP-3000	Cursor Control Panel	822-1746-102
DCP-3000	Display Control Panel (without AUTOTILT)	822–1134-002
DCP-3000	Display Control Panel (with AUTOTILT)	822–1134-102
DCP-3030	Display Control Panel (without AUTOTILT)	822-1828-102

EQUIPMENT	NOMENCLATURE	PART NUMBER
DCP-3030	Display Control Panel (with AUTOTILT)	822-1828-002
DCU-3010	Data Concentrator Unit	822-1278-001, -002,
DCU-3001	Data Concentrator Unit	822–1483-201, -250
ADC–3000	Air Data Computer	822–1109-002, -004, -014
AHC-3000	Attitude Heading Computer	822-1110-002
ECU-3000	External Compensation Unit	822-1200-003
FDU-3000	Flux Detector Unit	822-1193-001
FGC-3000	Flight Guidance Computer	822-1108-018, -118, -033, -218, -222
MSP-85	Mode Select Panel	622-6209-019, -020
APP-85	Autopilot Panel	622-6208-223, -227
SVO-3000	Elevator, Rudder, Aileron Servo	822-1168-001, -002
CDU-3000	Control Display Unit	822-0884-362
FMC-3000	Flight Management Computer	822-0883-015, -020
DBU-5000	Data Base Unit	822-2215-602
FSU-5010	File Server Unit	822-1543-001, -101
ALT-4000	Radio Altimeter	822-0615-002
DME-4000	Distance Measuring Equipment	822-1466-001
GPS-4000A	Global Positioning System Receiver	822-1377-001
HF-9031A	HF Transceiver	822-0101-002
HF-9041	HF Antenna Coupler	622-8114-002

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NAV-4000	VHF Navigation Receiver	822-1465-001
NAV-4500	VHF Navigation Receiver	822-1579-001
RTU-4210	Radio Tuning Unit	822-0836-434
RTU-4220	Radio Tuning Unit	822-0730-434
TDR-94D	Mode S Transponder	622-9210-006, -007
TTR-4000	TCAS II Transceiver	822-1294-001, -002
VHF-4000	VHF Communication Transceiver	822-1468-102, -302
RIU-4010	Radio Interface Unit	822-1863-001
RIU-4110	Radio Interface Unit	822-1864-001
RTA-800	Receiver/ Transmitter/Antenna	822-1050-004
RTA-852	Receiver/Transmitter/Antenna (12 inch with turbulence detection)	622-8439-004