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Course Syllabus: 523-0779585

COURSE TITLE: Hawker 750, 800XP, 850XP, 900XP 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. Hawker 800XP 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. Raytheon Hawker 800XP Avionics System Manual w/IFIS (excerpt) 523-0807190
4. Raytheon Hawker 800XP Avionics Diagnostic Guide w/IFIS 523-0807505
5. Raytheon Hawker 750/900XP Avionics System Manual (excerpt) 523-0808794

REFERENCES:

1. Raytheon Hawker 800XP Avionics System Manual w/IFIS 523-0807190
2. Raytheon Hawker 800XP Avionics Diagnostic Guide w/IFIS 523-0807505
3. Raytheon Hawker 800XP Operator's Guide w/IFIS 523-0807192
4. Raytheon Hawker 750/900XP Avionics System Manual 523-0808794

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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. Maintenance Diagnostics**
 - A. Overview
 - B. Maintenance Diagnostic Computer (MDC)
- 4. Electronic Flight Instrument System (EFIS)**
 - A. Overview
 - B. Adaptive Flight Display
 - i. Primary Flight Display (PFD)
 - ii. Multifunction Display (MFD)
 - C. Reversion Switch Panel (RSP)
 - D. Display Control Panel (DCP)
 - E. Cursor Control Panel (CCP)
 - F. Display Dimming Panel (DDP)
- 5. Integrated Flight Information System (IFIS)**
 - A. Overview
 - B. File Server Unit (FSU)
 - i. File Server Applications
 - ii. Enhanced Map Functions
 - iii. Electronic Charts
 - iv. Graphical Weather
 - C. External Compensation Unit (ECU)
 - D. Encrypted Application Key (EAK)
 - E. Electronic Charts Region Access Keys

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- F. Maintenance and Troubleshooting
 - i. Database Effective Dates

6. Engine Indicating System (EIS)

- A. Overview
- B. MFD Indications
 - i. Normal
 - ii. Transient
 - iii. Redline
 - iv. Compressed
 - v. Comparators
- C. Cursor Control Panel (CCP)
- D. Data Concentrator Unit (DCU)
- E. Maintenance and Troubleshooting
 - i. Status Messages
 - ii. Diagnostics

7. Air Data System (ADS)

- A. Overview
- B. Air Data Computer (ADC)
- C. Air Data Configuration Table (ADT)
- D. 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)
- C. External Compensation Unit (ECU)

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- D. 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. Flight Control Panel (FCP)
- D. Primary Servos (SVO)
- E. Autopilot and Yaw Damper Detailed Theory of Operation
 - i. Description of Fail Passive System
 - ii. Description of Null Seeking Servo Loops
- F. Autopilot Diagnostics
 - i. Entering and Using Autopilot Diagnostics
 - 1. Input Mode
 - 2. Output Mode
 - 3. Report Mode

10. Flight Management System (FMS)

- A. Overview
- B. Flight Management Computer (FMC)
- C. Control Display Unit (CDU)
- D. Database Unit (DBU)
- E. Flight Management Data Base Operations
 - i. 28 Day Database Load Procedure
 - ii. Fault History Download Procedure

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- F. PCD-3000 Operations
 - i. 28 Day Database Load Procedure

11. Radio Sensor System (RSS)

- A. Overview
- B. Radio Interface Unit (RIU) and External Compensation Unit (ECU)
- C. Audio Control Panel (ACP) and Audio Options Panel (AOP)
- D. Radio Tuning Operations
- E. VHF Comm Receiver/Transmitter (VHF)
 - i. Datalink/CPDLC/Link 2000+ and TCAS Ver. 7.1
- F. VOR/ILS/MB/ADF Receiver (NAV)
- G. Distance Measuring Equipment (DME)
- H. High Frequency Receiver/Transmitter (HF)
- I. HF Antenna Coupler (CPL)
- J. Radio Altimeter (ALT)
- K. Mode S Transponder (TDR-94D) with TCAS
- L. Maintenance and Troubleshooting
 - i. Flight Line Diagnostic Procedures
 - ii. Antenna Maintenance Considerations

12. Database Loading Operations

- A. Overview
- B. Field Loading of Databases

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13. Turbulence Weather Radar (TWR)

- A. Overview
- B. Microwave Radiation Hazards
 - i. AC 20-68B
- C. Weather Radar Theory
- D. Receiver/Transmitter Assembly (RTA-858)
- E. Display Control Panel (DCP)
- F. Weather Radar Fundamentals
- G. Maintenance and Troubleshooting
 - i. Radome Maintenance (AC 43-13)
 - ii. Flight Line Diagnostic Procedures

14. Summary – Review - Critique

- A. Test
- B. Critiques

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EQUIPMENT TYPE:

EQUIPMENT	NOMENCLATURE	PART NUMBER
Air Data Computer	ADC-3000	822-1109-003, -015
Adaptive Flight Display	AFD-3010	822-1084-312, -313
Adaptive Flight Display	AFD-3010E	822-1753-312, -313
Attitude Heading Computer	AHC-3000	822-1110-002
Radio Altimeter	ALT-4000	822-0615-002
ADF Receiver	ADF-462	622-7382-101
ADF Antenna	ANT-462B	622-7384-001
Communication Management Unit (Datalink Option)	CMU-4000	822-1739-003
		822-1121-002
COMM/NAV Tuning Unit	CTL-23C	822-2177-001
Cursor Control Panel	CCP-3000	822-1746-002
Control Display Unit	CDU-6200	822-1485-002, -038, -108
Configuration Strapping Unit	CSU-3100	822-1363-002
Data Base Unit	DBU-4100	822-0014-008, -104
Data Base Unit	DBU-5000	822-2215-202
Display Control Panel	DCP-3040	822-2117-002
Data Concentrator Unit	DCU-3001	822-1483-002, -010
Distance Measuring Equipment	DME-442	622-7309-101
Distance Measuring Equipment	DME-4000	822-1466-001
External Compensation Unit (AHS)	ECU-3000	822-1200-002
External Compensation Unit (RSS)	ECU-3000	822-1200-999
Flux Detector Unit	FDU-3000	822-1193-001
Flight Guidance Computer	FGC-3000	822-1108-023
Flight Guidance Panel	FGP-3000	822-1107-102
HF Feed Line	FL-9006	988-8095-001
Flight Management Computer	FMC-6000	822-0868-111
Global Positioning System	GPS-4000A	822-1377-001
Global Positioning System (WAAS non- precision approach)	GPS-4100	822-1397-001
Global Positioning System (WAAS LPV)	GPS-4000S	822-2189-001
Approach GPS Sensor	APR-4000	822-0993-001
GPS Antenna	GPS ANT	847-0012-030
HF Receiver/Transmitter	HF-9031A	822-0101-002

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EQUIPMENT	NOMENCLATURE	PART NUMBER
HF Antenna Coupler	HF-9041	685-0350-002
Integrated Card Cage	ICC-3000	822-1129-001
IAPS Environmental Control Module	IEC-3001	822-1167-001
Input/Output Concentrator Module	IOC-3100	822-1361-100
Maintenance Diagnostic Computer	MDC-3000	822-1139-301
Maintenance Diagnostic Computer	MDC-3110	822-1987-005
Maintenance Diagnostic Tables	MDT-3110	810-0042-090, -091
VOR/ILS/MKR Receiver	NAV-4000	822-1579-001
Options Control Module	OCM-3100	822-1484-282, -252
Power Supply - IAPS	PWR-3000	822-1137-001
Receive Transmitter Antenna (with Turbulence Detection)	RTA-858	622-8441-004
Servo Mount	SMT-65	622-5735-004
Elevator, Aileron, and Rudder Servo	SVO-3000	822-1168-002
Trim Servo	334D-6A	622-3260-001
Mode S Diversity Transponder with Flight ID	TDR-94D	622-9210-008
TCAS Directional Antenna	TRE-920	622-8973-001
TCAS Transmitter/Receiver	TTR-4000	822-1294-002
VHF Comm Transceiver	VHF-422C	822-1115-021
VHF Navigation Receiver	VHF-432	622-7194-201
File Server Unit	FSU-5010	822-1543-101
File Server Application Software	FSA-5000	810-0001-109 XM WXR -009 Universal WXR
External Compensation Unit	ECU-3000	822-1200-998
Collins Portable Access Software	CPAS-3000	810-0032-002, -003
Electronic Charts	ECH-5000	810-0002-001
Map Overlays	OVL-5000	810-0003-001
Graphical Weather (XM WXR)	GWX-3000	810-0007-001
Graphical Weather (Universal WXR)	GWX-5000	810-0004-001
XM Receiver (P/O XM Weather)	XMWR-1000	822-2031-002