



Global Avionics Training Specialists, LLC

CESSNA CITATION BRAVO

PRIMUS 1000 INTEGRATED AVIONICS SYSTEM

LINE MAINTENANCE COURSE SYLLABUS

I. INTRODUCTION

A. System Description

The PRIMUS 1000 is a completely integrated flight director, autopilot, yaw damper and electronic display system. The flight director provides a full complement of vertical and lateral computed steering modes. Three-axis aircraft attitude stabilization and path control are provided for optimum performance throughout the aircraft's normal flight regime. The automatic path mode commands are generated by the IC-600 Integrated Avionics Computer (IAC), which integrates the attitude and heading reference and air data functions into a complete aircraft control system.

The PRIMUS 1000 system employs two IC-600 IACs, one with autopilot capability, and one without. The IACs are interconnected with a serial digital data bus. This allows either pilot to couple their flight director function to the single autopilot.

The Electronic Display System (EDS) is totally integrated in the processing of primary flight display data and flight director data. This level of integration greatly simplifies the interface requirements for the overall system. This level of integration also implies that if the EDS is operational, the flight director is operational. Conversely, if the EDS has failed, the flight director has also failed. This approach features all the performance advantages of display integration, flexibility, redundancy and reliability.

A. System Description (cont'd)

The PRIMUS 1000 system also has provisions for input/output (I/O) and data management with external radio communication and navigation systems through digital/serial data bus interfaces.

The system displays heading, course, radio bearing, pitch and roll attitude, barometric altitude, selected alert altitude, radio altitude, course deviation, glide slope deviation, to-from indications, and DME indications. Lighted annunciators denote selected flight mode, altitude alert, decision height, and go-around mode engagement. Pitch and roll steering commands developed by the IC-600 IAC in conjunction with the MS-560 Mode Selector are displayed by steering pointers on the PFD, to enable the pilot to reach and/or maintain the desired flight path or attitude.

B. Course Objectives

This course of instruction is designed to familiarize and prepare line maintenance technicians to operate, maintain, troubleshoot and test the PRIMUS 1000 Integrated Avionics System to the LRU level. Equipment interface, theory of operation and flight operations are thoroughly discussed. Mode logic, signal flow, and ground maintenance testing will be covered in detail.

C. Arrangement

Based upon past experience, Global Avionics Training Specialists has arranged the course material in an order of presentation best suited to continuity and ease of comprehension.

D. Duration

The course is 5 days in length, 8 hours a day for a total of 40 hours.

E. Student Prerequisites

Students attending this course should be line maintenance avionics technicians, with a working knowledge of flight deck displays, flight guidance principles and servo loop theory.

II. COURSE CURRICULUM

A. Orientation

1. Welcome
2. Student Registration
3. Class policies
4. Course description
5. Distribution of training materials
6. Location of facilities
7. Security

B. System Description

1. What is an Autopilot System?
2. What is a Flight Director System?
3. System Flow Diagram
 - a. Attitude and Heading Reference System
 - b. ADZ-850 Air Data System
 - c. Electronic Display System
 - d. Weather Radar System
 - e. Traffic Collision Avoidance System
 - f. Global Positioning System
 - g. Enhanced Ground Proximity Warning System
 - h. Flight Guidance System
 - i. Primus II Integrated Radio System
4. Digital Buses
5. Component Locations

C. Sub-System/LRU Descriptions and Operation

1. Attitude and Heading Reference System
 - a. VG-14A Vertical Gyro
 - b. C-14D Directional Gyro
 - c. CS-412 Dual Remote Compensator
 - d. FX-220 Flux Valve

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2. AZ-850 Micro Air Data Computer
 - a. Pitot-Static Overview
 - b. AZ-850 Micro Air Data Computer
 - c. BL-870 PFD Bezel Controller
 - d. MADC Failure Indications

3. Electronic Display System
 - a. Sub-system architecture
 - b. IC-600 Integrated Avionics Computer
 - c. DU-870 Display Unit
 - d. BL-870 Bezel Controller
 - e. BL-871 Bezel Controller
 - f. DC-550 Display Controller
 - g. MC-800 MFD Controller
 - h. RI-553 Remote Instrument Controller
 - i. External select switches

4. Primus XXX Weather Radar System
 - a. What is Weather Radar?
 - b. WU-XXX Receiver/Transmitter/Antenna
 - c. WC-XXX Weather Radar Controller
 - d. What is REACT?
 - e. Roll Offset Compensation
 - f. Weather Radar Test and Fault Codes

5. Traffic Collision Avoidance System
 - a. What is TCAS?
 - b. TA's and RA's
 - c. TCAS Computer
 - d. Directional Antenna
 - e. Omni-Directional Antenna
 - f. TCAS Zoom Window Display
 - g. Typical RA Scenario and Display

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6. Global Positioning System
 - a. What is GPS?
 - b. GPS Receiver
 - c. GPS Antenna
 - d. GPS Position Sensor Page on FMS CDU
 - e. Control/Space/User Segments
 - f. GPS Modes of Operation

7. Enhanced Ground Proximity Warning System
 - a. What is EGPWS?
 - b. EGPWS Inputs and Outputs
 - c. EGPWS Computer
 - d. Typical Cockpit Warning Lamps
 - e. Typical Display and Colors
 - f. EGPWS Alerts

8. Flight Guidance System
 - a. What is a Flight Director/Autopilot/Yaw Damper?
 - b. IC-600 Integrated Avionics Computer
 - c. MS-560 Mode Selector
 - d. DC-550 Display Controller
 - e. PC-400 Autopilot Controller
 - f. AG-222 Normal Accelerometer
 - g. Flight Director Functions
 - h. Flight Director Interface Diagrams
 - i. System Performance Operating Limits
 - j. Flight Director Modes of Operation
 - k. Autopilot/Yaw Damper
 - l. RG-204 Rate Gyro
 - m. SM-200 Servo Drive and SB-201 Bracket
 - n. Autopilot Modes of Operation
 - o. Autopilot Interface Diagram
 - p. Yaw Damper Interface Diagram
 - q. Autopilot/Yaw Damper Engage Diagram
 - r. Autopilot Servo Loop Diagrams
 - s. Yaw Damper Servo Loop Diagram
 - t. Flight Guidance Monitors

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9. Primus II Integrated Radio System

- a. What is the Primus II Radio System?
- b. RNZ-850 Integrated Navigation Unit
- c. RCZ-850 Integrated Communications Unit
- d. XS-850 Mode S Transponder
- e. RM-850 Radio Management Unit
- f. AV-850 Audio Panel
- g. CD-850 Clearance Delivery Control Head

III. Ground Checkout Procedures