

Publications & Training Services

Course Syllabus: 523-0825399

(Edition 02)

COURSE TITLE: Bombardier Challenger 604 Pro Line Fusion
Flight Line Maintenance

TARGET AUDIENCE: This course is designed for Flight Line Maintenance personnel.

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 Fusion Avionics System installed on Bombardier Challenger-604 aircraft.

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

This course meets the requirements of ATA Spec 104 Level 3.

The Challenger 604 Pro Line Fusion Avionics System consists of the LRUs identified in the section titled EQUIPMENT COVERAGE by description 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 Challenger-604 Pro Line Fusion 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: Standard Class (Theory and Practical) 5 Days
Non-standard class (Theory only, on-line) 4 days

TRAINING DEVICES:

1. Special Test Equipment
 - a. CL-604 Pro Line Fusion Test Rig, Cedar Rapids (if available)
 - b. CL-604 Pro Line Fusion aircraft (if available)
 - c. CL-604 Pro Line Fusion FMS Desktop Simulator (if available)
2. Laptop Computer
3. LCD Projector

TRAINING MATERIALS:

1. Student Guide (Electronic)
2. Student Handouts (Electronic)
3. Videos (as applicable)

REFERENCES:

| Document Name | Part Number | Edition | Revision | Date |
|--|--------------------|----------------|-----------------|-------------|
| Bombardier Challenger 604 Pro Line Fusion FMS V1.4 Pilot Guide | 523-0825299 | 2 | 0 | 03 Mar 2020 |
| Bombardier Challenger 604 Pro Line Fusion Fault Isolation Publication | 523-0825300 | 1 | 0 | 17 Jul 2019 |
| Bombardier Challenger 604 Pro Line Fusion Installation Manual | 523-0825301 | 4 | 0 | 15 Jun 2021 |
| Bombardier Challenger 604 Pro Line Fusion FMS V1.4 Quick Reference Guide | 523-0825302 | 1 | 0 | 12 Oct 2018 |
| Bombardier Challenger 604 Pro Line Fusion FMS V2.1 Pilot Guide | 523-0829545 | 2 | 0 | 23 Aug 2021 |
| Bombardier Aerospace Challenger 604 Avionics System Manual | 523-0777290 | 4 | 0 – TR 9 | 19 Jan 2009 |
| ADC-XX/ADC-XXX/ADC-XXXX SIL 11-1 | 523-0819325 | 1 | 0 | 06 Apr 2011 |

COURSE SYLLABUS

0. Welcome & Introductions

- A. Introductions
- B. Policies and Procedures
- C. Course Registration
- D. Course Description
- E. Course Material
- F. Schedule
- G. Course Objectives
- H. Evaluation
- I. Critique

1. System Overview

- A. Flight Deck Layout
- B. Flight Deck Controls

2. Integrated Avionics Processing System (IAPS)

- A. Overview
- B. System Architecture
- C. Integrated Card Cage (ICC)
- D. Lightning/HIRF Protector (LHP)
- E. Power Supply Module (PWR)
- F. Internal Environmental Controller (IEC)
- G. Input Output Concentrator (IOC)
- H. Configuration Strapping Unit (CSU)
- I. Detailed Functional Theory
- J. Maintenance and Troubleshooting

3. Electronic Flight Instrument System (EFIS)

- A. Overview
- B. Adaptive Flight Display (AFD)

- C. Reversion Switch Panel (RSP)
- D. Cursor Control Panel (CCP)
- E. Multifunction Keyboard Panel (MKP)
- F. Single Knob Panel – Baro (SKP)

4. Engine Indication and Crew Alerting System (EICAS)

- A. Description
- B. Theory of operation
- C. Data Concentrator Unit (DCU)

5. Onboard Maintenance System (OMS)

- A. Overview
- B. Maintenance Diagnostic Computer

6. Flight Control System (FCS)

- A. System Operation
- B. System Components
- C. FCS Diagnostics

7. Flight Management System (FMS)

- A. System Operation
- B. FMS Software Application

8. Integrated Flight Information System (IFIS)

- A. Data link Graphical Weather (DLGWX)
- B. XM Graphical Weather
- C. Electronic Charts
- D. Enhanced Maps

9. Air Data System (ADS) and Inertial Reference System (IRS)

- A. Air Data Computer (ADC-850E)
 - i. Air Data Computers and their function
 - ii. Controls and Indications
- B. Inertial Reference System (LTN-101)
 - i. Inertial Reference Computers and their function
 - ii. Controls and indicators

10. Communications, Navigation and Surveillance (CNS)

- A. Overview
- B. GPS
- C. VOR/ILS/MB/ADF Receiver (NAV)
- D. Distance Measuring Equipment (DME)
- E. VHF Comm. Receiver/Transmitter (VHF)
- F. Mode S Transponder (TDR-94)
- G. Traffic Collision Avoidance System (TCAS)
- H. High Frequency (HF) Radio
- I. Radio Altimeter (ALT)
- J. Radio Tuning Operations
- K. General Maintenance Procedures for Comm /Nav /Pulse Equipment

11. Weather Radar (WXR)

- A. Overview
- B. AC 20-68B Microwave Radiation Hazards
- C. Weather Radar Theory
- D. Receiver Transmitter Assembly (RTA-854)
- E. Receiver Transmitter Assembly (RTA-4114)

F. Maintenance

12. Dataloading

- A. Overview
- B. Data Base Unit (DBU)
- C. Dataloading Process
 - i. DBU-4100
 - ii. Non-Enhanced DBU-5000
 - iii. Enhanced DBU-5000
 - iv. CPAS
 - v. PCD
- D. Dataloading Faults and Failures

13. Synthetic Video System (SVS) Option

- A. Overview
- B. Theory of Operation

14. Summary

- A. Summary of Training
- B. Questions

EQUIPMENT COVERAGE:

| UNIT | DESCRIPTION | PART NUMBER |
|------------|---|--|
| ADS | Air Data System | |
| ADC-850E | Air Data Computer | 822-0842-421 822-0482-621 |
| SLZ7960 | Angle of Attack (AOA) Transmitter | 856-0077-010 |
| CNS | Communications, Navigation, Surveillance | |
| ADF-462 | Automatic Direction Finder | 622-7382-101 |
| AIS-ACP3V | Avtech Audio Control Panel, Triple VHF | 856-0073-030 |
| AIS-ACPDV | Avtech Audio Control Panel, Dual VHF | 856-0073-020 |
| AIS-REU | Remote Electronics Unit | 856-0073-010 |
| AIS-REUMT | REU Mounting Tray | 856-0073-040 |
| ALT-55B | Radio Altimeter | 622-2855-011 |
| ANT-462B | ADF Antenna, Dual | 622-7384-001 |
| DME-442 | Distance Measuring Equipment | 622-7309-101 |
| FL-9001 | HF Feedline | 685-0326-001 |
| GPS ANT | GPS Active Antenna | 847-0006-010 |
| GPS-4000S | GPS Receiver, SBAS | 822-2189-004 822-2189-010 822-2189-100 |
| HF-9031A | HF Receiver/Transmitter | 822-0101-002 |
| HF-9041 | HF Antenna Coupler | 685-0350-002 |
| MT-9030A | HF Radio Mount | 622-8116-001 |
| MT-9030B | HF Radio Mount | 822-0594-001 |
| MT-9042A | HF Coupler Mount, Dual | 622-8124-001 |
| RAC-870 | Radio Altimeter Converter | 622-7209-002 |
| RTU-4220 | Radio Tuning Unit (Dual HF) | 822-0730-468 |
| TCASMNT | TCAS Mount | 856-0078-020 |

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| TDR-94D | Diversity Mode S Transponder, ADS B Out | 622-9210-501 |
| TRE-920 | TCAS Directional Antenna | 622-8973-001 |
| TTR-920 | TCAS Receiver / Transmitter | 622-8971-020 |
| TTR-921 | TCAS Receiver / Transmitter | 822-1293-033 |
| TTR-2100 | TCAS Receiver / Transmitter | 822-2911-001 |
| VHF-422B | VHF Comms Transceiver | 622-7293-101 622-7293-121 |
| VHF-422C | VHF Comms Transceiver | 822-1115-001 822-1115-021 |
| VHF-422D | VHF Comms Transceiver | 822-1116-001 |
| VHF-4000 | VHF Comms Transceiver, 8.33Khz, Data Link | 822-1468-390 |
| VIR-432 | VHF Navigation Receiver | 622-7194-201 |

Display System

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|-----------|--|------------------------------|
| AFD-3700 | Adaptive Flight Display | 822-3065-001 |
| AFDR-3700 | Adaptive Flight Display Runtime | 810-0346-002 |
| APCT-3700 | Airframe Parameter Configuration Table | 810-0422-400 |
| APM-5000 | Aircraft Personality Module | 822-2195-001 |
| CCP-3500 | Cursor Control Panel | 822-2754-010 |
| FDSA-6500 | Flight Display System Application | 810-0234-4B0001 |
| IMAT-3700 | Integrated Modular Avionics Table | 810-0352-100 810-0352-101 |
| MKP-3500 | Multifunction Keyboard Panel | 822-2568-010 |
| PMA-6000 | Protocol Manager Application | 810-0192-040 |
| RTSA-6000 | Radio Tuning System Application | 810-0048-702 |
| SKP-3500 | Single Knob Panel (Barometric) | 822-3163-010 |

Data Link

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|-----------|--------------------------------------|--------------|
| ATN-6200 | ATN CPDLC Key (Link 2000+) | 810-0187-001 |
| CMU-4000 | Communications Management Unit | 822-1739-704 |
| DLCA-6500 | Data Link Communications Application | 810-0315-360 |

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|-----------|--------------------------------------|------------------------------|
| ECDA-6000 | Emulated Control Display Application | 810-0233-100 810-0233-120 |
| FAN-6200 | FANS ATC Data Link Key (CPDLC) | 810-0186-001 |

EICAS Engine Indication & Crew Alerting System

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|------------|--|-----------------|
| DCU-4002 | Data Concentration Unit | 822-0179-017 |
| EICAS-6000 | Engine Indication Crew Alerting System | 810-0245-4B0001 |
| ERU-4000 | EICAS Routing Unit | 822-0845-001 |
| LDU-4000 | Lamp Driver Unit | 622-9822-001 |
| RDC-4002 | Remote Data Concentrator | 822-1533-001 |

FGS Flight Guidance System

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|----------|-------------------------|------------------------------|
| FCC-4006 | Flight Control Computer | 822-0809-810 |
| FCP-4003 | Flight Control Panel | 822-0182-001 |
| SMT-87A | Servo Mount | 822-0259-001 |
| SMT-87B | Servo Mount | 822-0260-001 |
| SSM-4000 | Servo Switching Module | 822-0782-001 |
| SVL-4000 | Servo, Linear Actuator | 622-9968-002 |
| SVO-85A | Primary Servo | 622-4404-001 622-4404-101 |
| SVO-85B | Primary Servo | 622-5027-001 622-5027-101 |

FMS Flight Management System

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|-----------|--------------------------------------|-----------------|
| FMSA-6010 | Flight Management System Application | 810-0163-4B0001 |
| RNP-6000 | RNP AR \geq 0.3 Key | 810-0201-001 |

IAPS Integrated Avionics Processing System

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|----------|---------------------------------|--------------|
| CSU-4100 | Configuration Strapping Unit | 822-1364-002 |
| ICC-4007 | IAPS Card Cage | 822-0781-001 |
| IEC-4000 | IAPS Environmental Controller | 822-0288-001 |
| IOC-4100 | IAPS Input/Output Controller | 822-1362-710 |
| LHP-4000 | Lightning HIRF Protector (Left) | 822-0287-701 |

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|----------|----------------------------------|------------------------------|
| | | 822-0287-702 |
| LHP-4001 | Lightning HIRF Protector (Right) | 822-0332-701 822-0332-702 |
| OCM-4100 | Options Control Module | 822-1463-200 822-1463-214 |
| PWR-4000 | IAPS Power Supply | 622-9945-021 |

IFIS Integrated Flight Information System

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|------------|--|--------------|
| ATF-3510 | Advanced Terrain Features | 810-0391-001 |
| CHTX-3500 | Charts Extension Key | 810-0476-001 |
| DLWX-3500 | Data Link Weather Key | 810-0353-001 |
| ECH-3500 | Electronic Charts Key | 810-0361-001 |
| ECU-3000 | External Compensation Unit | 822-1200-996 |
| FSA-6000 | File Server Application Software | 810-0072-304 |
| FSAX-3500 | Outboard Enhanced Maps and Graphical Weather Key | 810-0354-001 |
| OVL-3500 | Enhanced Map Overlays Key | 810-0360-001 |
| VID-3500 | Standard Analog Video Key | 810-0392-001 |
| VSDK-3500 | Vertical Situation Display Key (Advanced) | 810-0113-001 |
| XMA-1000G | GPS/XM Combination Antenna | 866-5010-010 |
| XMWK-3500 | XM Weather Key | 810-0355-001 |
| XMWR-1000S | SXM Weather Receiver | 822-3365-001 |

IRS Inertial Reference System

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|---------|------------------------------|--------------|
| LTN-101 | Inertial Reference Unit | 856-0075-010 |
| LTNMNT | LTN-101 Mount | 856-0078-010 |
| MSU | IRU Mode Select Unit, Dual | 856-0075-020 |
| MSU | IRU Mode Select Unit, Single | 856-0075-050 |

LDS Lightning Detection System

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|----------|--------------------------------------|--------------|
| WX-1000 | Lightning Detection System Antenna | 856-0072-020 |
| WX-1000E | Lightning Detection System Processor | 856-0072-010 |

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| WX-1000MT | Lightning Detection System Processor Tray | 856-0072-030 |
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OMS Onboard Maintenance System

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|-----------|--|-----------------|
| ODLA-3500 | Onboard Data Loader Application | 810-0345-1R0001 |
| OMSA-6000 | Onboard Maintenance System Application | 810-0106-350 |
| OMST-6000 | Onboard Maintenance System Tables | 810-0099-4B0001 |

WXR Weather Radar

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|-----------|--|--------------|
| RTA-854 | Receiver/Transmitter/Antenna | 622-8440-003 |
| | (with Turbulence Detection) | 622-8440-004 |
| RTA-4114 | Multiscan Weather Radar | 822-2255-001 |
| WXRK-4001 | Weather Radar Key – Multiscan Mode with Turbulence | 810-0267-001 |

Mounts

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|---------|-----------------------------|--------------|
| MMT-125 | Mount – Single Installation | 622-9670-002 |
| MMT-130 | Mount, Single Installation | 622-9671-002 |
| MMT-150 | Mount, 1/2 ATR Short, Dwarf | 622-9672-003 |
| UMT-12 | Mount, 3/8 ATR | 622-5212-001 |
| UMT-13 | Mount, 1/2 ATR | 622-5213-001 |
| UMT-18 | Mount, 3/4 ATR | 622-9977-002 |
| | | 622-9977-004 |