



## Project/Media Update

**Date:** November 14, 2011  
**Subject:** First “out-of-country” application for Citation II Mod and STC  
Developed by MC2 installed and certified for Dutch client NLR.

### For Immediate Publication

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**Mississauga, Ontario, CANADA** – The Dutch National Aerospace Laboratory (NLR) operates two research aircraft to test new technology and procedures. One of these aircraft is a Cessna Citation II that is owned and operated jointly with the Delft University of Technology, Faculty of Aerospace Engineering. This Citation has been extensively modified by NLR and Delft University of Technology to serve as a versatile airborne research platform and flight/airspace inspection platform. The flight envelope of the Citation II allows a wide range of operations to be performed. The cabin can accommodate a maximum of eight observers in addition to the two-pilot cockpit crew.

NLR recently engaged Mid-Canada Mod Center (MC2) to perform an extensive cockpit and flight systems upgrade to the aircraft. The project involved use of the same parameters that MC2 developed in an STC for the fleet of Transport Canada Citation II fleet in 2006. It is based around the Collins ProLine 21 big-screen EFIS and Avionics Systems, Airborne Collision Avoidance Systems and Terrain Awareness Warning Systems.

The work was performed at MC2’s YYZ facility and was completed in the second week of November 2011 when the aircraft was officially handed back to its owners. As this aircraft operates in EU airspace, a new STC had to be included as part of the installation and associated paper work.

In speaking about the project, Bill Arsenault, Vice President of MC2 said – *The development of this particular mod was considered by some as unique and perhaps a one-off when our team first envisioned it 5 years ago for Transport Canada and their fleet. When we engineer a mod we do so with the big picture in mind – not just the project in hand. Our team has always applied their expertise to mods equally for both newer and older airframes – focusing on delivering improved safety and reliability with performance enhancements that also offer improved cockpit resource management attributes. The applicability of this mod to this and similar aircraft stands the test of time. With the global economy still uncertain and driving more to consider extending the life of their older airframe, mods like this are finding their mark. We are very pleased to have worked with NLR in bringing a new chapter to the life of an aircraft they value and rely on.*

## ***Profile of Selected System Components . . .***

Rockwell Collins' Pro Line 21 system is the heart of this upgrade. Rockwell Collins is a market leader in the development of advanced avionics such as integrated electronic charts, enhanced maps and up to date graphical weather as well as supporting the transition to Communication, Navigation, Surveillance / Air Traffic Management (CNS/ATM) environment.

The Pro Line 21 IDS flight deck at the heart of this MC2 mod programme offers many key benefits. These include:

- Operational Commonality with Citation CJ1+, CJ2+, CJ3 Flight Decks
- Three Full Color Liquid Crystal Display Flight Deck
- TCAS II and Mode S Diversity Transponders with Enhanced Surveillance
- Universal UNS-1FW MMS (multi-mission Management System) with LPV monitor certified for WAAS and **EGNOS (European Geostationary Navigation Overlay Service) LPV approaches.**
  - Designed to Meet Needs of the Corporate and Airline Aircraft Missions
  - Coupled VNAV with Temperature Compensation in Accordance with Transport Canada ACPL 57
  - WAAS LPV and LNAV / VNAV Approaches
- Integrated Flight Information System with a Single File Server Unit (Optional)
  - Electronic Charts with Chart Link™ Operation
  - Enhanced Map Overlays
- Integrated Maintenance and Diagnostics (Optional with Maintenance Diagnostics)
- Electronic Checklists (Optional with Maintenance Diagnostics)
- Data Link Capability (VDL Mode 2) (Optional)
- Growth Path to Meet Future Flight Deck Graphics and Air Traffic Environment
- Integrated Pro Line 21 CNS Radio System
  - RTU Tuning
- Universal Class A TAWS Solution

The baseline system specified for the upgrade includes:

- Three Large 10 x 8-inch AMLCDs Providing Electronic Flight Instrument System
- Solid-State Turbulence Weather Radar
- Dual Mode S Diversity Transponders with Enhanced Surveillance
- TCAS II
- Integrated Avionics Processing System (IAPS) Cabinet (Housing Maintenance Diagnostic and Flight Management System)
  - Industry Standard Flight Management Map Symbolology
  - Maintenance Diagnostic System
  - Electronic Checklist
- Pro Line 21 Radio System
  - Dual Radio Tuning Units
  - Dual VHF Communication Radios
  - Dual VHF Navigation Receivers with ADF
  - Dual Distance Measuring Equipment
- Dual Solid State Attitude Heading Reference System



The L-3 avionics systems GH-3100 Electronic Standby System also forms a key part of the this mod. Designed to replace conventional electro-mechanical standby attitude, airspeed and altitude instruments, the solid-state GH-3100 ESIS is capable of providing all three functions, plus heading, slip/skid, navigation data and vertical speed, in a single three-inch flat-panel display. The GH-3100 features an integrated air data sensor card with pitot static connections directly to the unit, eliminating the need for a remote mounted air data computer. An Active Matrix Liquid Crystal Display (AMLCD) provides exceptional readability in direct sunlight as well as dark cockpit environments.

### **About MC2 . . .**

Mid-Canada Mod Center is one of Canada's premiere aviation avionics sales, installation and integration service. MC2 have earned a global reputation for developing and bringing to market their unique expertise in all forms of airborne communication, cabin entertainment systems, TCAS, EGPWS, TAWS, RVSM and EFB applications.

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This photo shows the completed MC2 Citation II mod as installed on the NLR aircraft. With a Pro Line 21 System as the "heart" of this mod, the new cockpit features 3 Large 10 x 8-inch AMLCDs providing the Electronic Flight Instrument System. It also includes Solid-State Turbulence Weather Radar, Dual Mode S Diversity Transponders with Enhanced Surveillance and TCAS II. Additionally there is an Integrated Avionics Processing System (IAPS) Cabinet (Housing Maintenance Diagnostic and Flight Management System), Pro Line 21 Radio System and Dual Solid State Attitude Heading Reference System. This is the same basic mod that was applied to the Transport Canada Citation II fleet. It is has been in continuous service for them since 2007.

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