CAE Mission Crew Trainer

Airborne intelligence, surveillance, and reconnaissance (ISR) relies heavily on airborne assets to acquire, process, and pass information in a responsive and timely manner. Extensive training is required to enable the successful employment and integration of these assets. Complete crew training in their platform systems, sensors, and the operational environment is the cornerstone to enabling an airborne ISR asset to integrate with other forces.

CAE's MCT solution

CAE's MCT architecture is specifically aimed at airborne ISR training and provides a high-fidelity, yet cost-effective crew training system.

CAE's MCT is a Level 5/6-equivalent flight training device that includes the following characteristics:
- Replica mission console panels, switches, controls, and instruments, all in the proper location and relationship to each other
- Functional data management, navigational, communications and systems controls, displays, and instrumentation
- System and sensor indications which respond appropriately to switches and controls
- Aircraft, target, and environment simulation tailored for the aircraft class and its role
- Full instructor controls

The MCT advantage

CAE's MCT provides for a high-fidelity, yet cost-effective training system using key design drivers:
- Re-use of operational mission management system software to preserve simulator concurrency with the aircraft systems
- Provide a mission console emulation utilizing 2D fidelity wherever possible
- Re-use of system, sensor and environmental models from existing ISR simulations
- Provide station representation flexibility to enable individual, part-crew or full crew procedural or mission training
- Provide sufficient fidelity to enable realistic continuation training

Software concurrency with aircraft

The CAE MCT ensures concurrency with the operational platform through utilization of the aircraft operational load software within the training device. The ability to re-host the operational software within the MCT ensures that as the operational software is upgraded, the training system remains concurrent with the line aircraft.

This approach lowers the lifecycle cost of the simulator ownership by not requiring custom software builds for the simulator each time the aircraft software is modified and avoids negative training potential if the two are not identical. The use of the operational software further ensures that the fidelity of the simulator exactly matches that of the aircraft software capabilities.

System architecture

The approach for CAE's MCT begins with a commercial-off-the-shelf (COTS) hardware emulation of the crew workstation that provides full integration with the aircraft operational software ported to commercial hardware. The operational software is surrounded by a complete synthetic simulation environment that provides the entire sensor and system information. The synthetic environment includes all of the environmental simulations of terrain, atmosphere, and ocean and models their effects on the sensors.
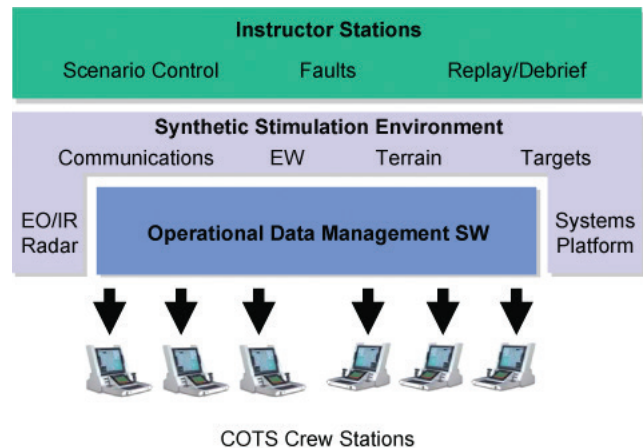
The system architecture allows for the crew stations to function individually as part-task trainers or operate in pairs, groups or as an entire crew to achieve the training objective.

Sensors and systems

The CAE MCT is designed with an open architecture to support addition of new sensors and systems. The MCT systems can be customized to support the full range of ISR sensors including:

- Imaging radar (SAR, ISAR, GMTI)
- Electro-optical infra-red (EO/IR)
- Electronic warfare support measures and intelligence (ESM/Elint)
- Acoustics
- Data link
- Communications (V/UHF, HF, Satcom)

Reconfigurable crew station

The ability to reconfigure the MCT provides tremendous training flexibility. Reconfiguration allows the trainer to represent different operator crew stations at a single simulator station. This reconfiguration ability reduces the need for dedicated part-task trainers and additional training devices to train multiple operators of the same type. The MCT architecture allows one instructor to control multiple scenarios simultaneously and may assign more than one student to a scenario
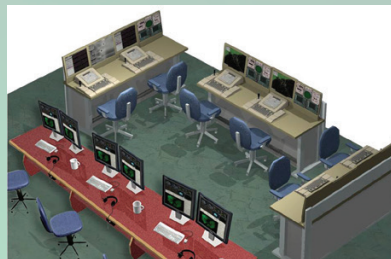
Instructor operator station (IOS)

The CAE MCT uses a versatile, user-friendly instructor operator station (IOS) to provide the instructor/operator with complete control of the synthetic environment and the ability to monitor all student activity. The IOS incorporates a situational awareness display that shows position of virtual aircraft and all other entities in the scenario.

The IOS enables:

- Monitoring the student
- Modification of all environmental elements
- Repositioning of virtual aircraft
- Start, stop, pause, rewind, and restart functions for scenario exercising
- Modify properties of all entities in the scenario
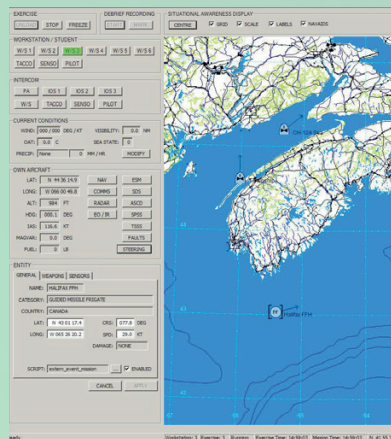
Program example

CAE has been contracted to customize the MCT system to provide the procedures crew trainer (PCT) and operational mission simulator (OMS) for Canada's CP-140 Aurora aircraft. Where the PCT uses virtual interfaces to represent aircraft instruments and controls, the OMS will use actual aircraft hardware. The OMS will faithfully replicate the tactical compartment of the CP-140 Aurora in every aspect except for motion. The CP-140 Aurora PCT and OMS will have a common IOS. Any scenarios developed for the PCT will be available for use by the OMS.

Canada
CAE Canada
150 Metcalfe Street, Suite 2201
Ottawa, ON K2P 1P1

Tel: +1-613-247-0342
milsim@cae.com

United States
CAE USA
4908 Tampa West Blvd.
Tampa, FL 33634

Tel +1-813-885-7481
Fax +1-813-901-6429
cae_usa@cae.com

United Kingdom
CAE UK plc
Innovation Drive, Burgess Hill
West Sussex RH15 9TW
England

Tel +44 (0) 1444-247535
Fax +44 (0) 1444-244895
cae_plc@cae.co.uk

Europe
CAE GmbH
Steinfurt 11
D-52222 Stolberg, Germany

Tel +49-2402-106-0
Fax +49-2402-106-270
info@cae-gmbh.de

Australia
CAE Australia Pty Ltd
Unit 40, Slough Business Park
Slough Avenue
Silverwater, NSW 2128

Tel +61-2-9748-4844
Fax +61-2-9714-0300
caeaus@cae.com.au

Asia
CAE Singapore (S.E.A.) Pte Ltd
2 Seletar Aerospace Link
Singapore 797570

Tel: +65 6430 4390
Fax: +65 6430 4399
milsim@cae.com

India
CAE India Pvt Ltd
Survey No.26 & 27, IVC Road
Bandaramanahalli Village, Uganvadi
Post Devanahalli Taluk, Bangalore -
562110 India

Tel +91-80-2625-6000
Fax +91-80-2625-6160
caeindiapvtltd@cae.com

Middle East
CAE Middle East
P O Box 2116
Dubai, United Arab Emirates

Tel +971-4-2949466
Fax +971-4-2948406
milsim@cae.com

Corporate Headquarters
CAE
8585 Côte-de-Liesse
Saint-Laurent, Quebec
Canada H4T 1GS

Tel +1-514-341-6780
Fax +1-514-734-5718
milsim@cae.com

CAE