

UAS Training Solutions





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Training and operational support for mission readiness

The use of unmanned aerial systems (UAS) by defence and security forces globally has grown over the past decade, and is only expected to continue to grow significantly. In addition, unmanned systems will be used increasingly for commercial applications such as remote inspection of pipelines and hydroelectric installations, surveillance of forest fires, observation of critical natural resources, assessing natural disasters, support to public safety, and a range of other applications. This increase in the use of UAS capabilities results in the need to have more highly skilled UAS pilots, sensor operators, and mission commanders combined with the ability to provide decision-making support.

As a global leader in training and simulation, CAE has developed competencies and leading-edge technologies that are directly applicable to a range of UAS operations. CAE offers mission training solutions, mission planning and analysis, training system integration, simulators and training devices, and comprehensive in-service support solutions for UAS operators.

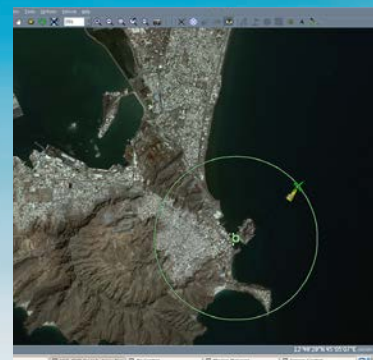


Experience. Technology Leadership. Integrated and Interoperable.

CAE is leveraging its experience in training and simulation to offer integrated UAS training solutions to defence and security forces as well as civil organizations.

CAE offers:

- › Mission training solutions;
- › Simulation-based mission planning and analysis solutions;
- › Training systems integration;
- › UAS mission trainers;
- › In-service support to operational systems.

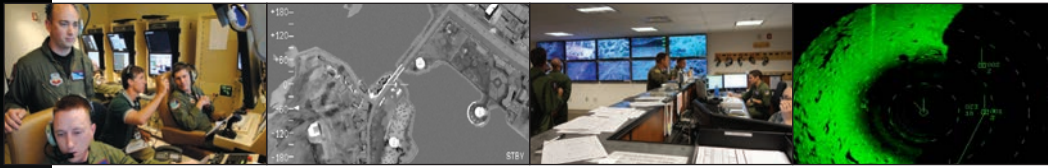


UAS Training Services

CAE is a world-class training company. CAE offers civil aviation and military training services at nearly 70 locations worldwide where the company trains approximately 120,000 crewmembers annually. CAE is leveraging its expertise in simulation and experience providing comprehensive training services to offer customized UAS training services in support of defence and security forces worldwide. In addition, CAE is developing a range of UAS training programs to support the introduction of unmanned systems for commercial applications.

CAE can offer training services for UAS pilots, sensor operators, and mission commanders. The company has extensive experience and expertise developing and delivering comprehensive training solutions, from ab-initio training to type-qualification, recurrent training, and mission rehearsal for most types of unmanned vehicles and payloads

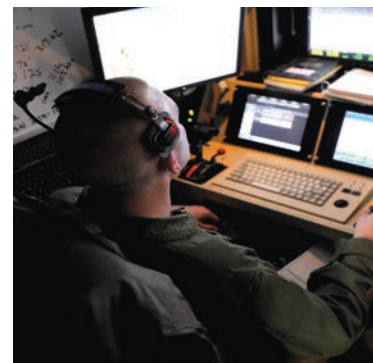




CAE's Portfolio of UAS Solutions

Some of the key offerings in CAE's UAS training services portfolio include:

- Courseware;
- Classroom training facilities;
- Brief and debrief capabilities;
- Full-spectrum UAS mission trainers;
- Instructors for live and synthetic training;
- High fidelity sensor and payload training;
- Mission training and rehearsal;
- Distributed mission operations centres;
- Training device maintenance;
- Training centre operations.



UAS Mission Trainer

The CAE UAS Mission Trainer is CAE's baseline UAS simulator that can be tailored and customized for a variety of functions. It combines an open architecture with commercial-off-the-shelf hardware and simulation software, minimizing the use of proprietary designs to provide a comprehensive, platform-agnostic training system. The CAE UAS Mission Trainer addresses the following training tasks as well as research and development capabilities:

- › Ab-initio training;
- › Basic flight operation;
- › Basic sensor payload operation;
- › Developing doctrine;
- › Developing weapon employment tactics;
- › Experimentation and evaluation of sensor payloads.

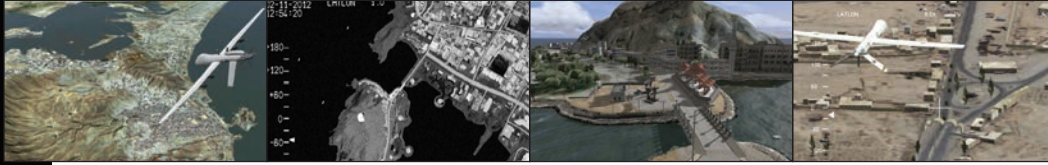
The CAE UAS Mission Trainer is available as an integrated product that includes:

- › Air Vehicle and Ground Control Station (GCS)
- › Typical payloads and support for additional ones, such as:
 - Electro-Optical
 - Synthetic Aperture Radar (SAR)
 - Weapons
 - Electronic Warfare/SIGINT
- › Virtual Environment
 - Common database (CDB) and Dynamic Synthetic Environment (DSE)
 - Physics-based computer generated forces (CGF)
 - Supports distributed mission operations (DMO)

Capabilities

- › High fidelity simulation
- › Open architecture
- › STANAG 4586 compliant
- › Unclassified and not regulated by the International Traffic in Arms Regulation (Non-ITAR)
- › Configurable instructor operator station (IOS)





UAS Mission Trainer Configurations

CAE UAS Mission Trainer – Laptop Solution

The laptop version of CAE's UAS Mission Trainer uses the same high fidelity simulation as the fully configured simulator. It offers added flexibility for the students to learn at their own pace, and can also be set-up for in-classroom learning.

CAE UAS Mission Trainer – Portable/Deployable Solution

The portable/deployable version of the CAE UAS Mission Trainer is configured as a mini-host with PC monitors. The portable solution is offered as a deployable kit, ideal for training in the theatre of operations. CAE's UAS portable mission trainer host is connected to a series of monitors that provide GCS functionality, aircraft and sensor operation and training. The layout is configured as per customer specification to optimize and achieve the training objectives.

CAE UAS Mission Trainer -- Fixed-base with Ground Control Station (GCS)

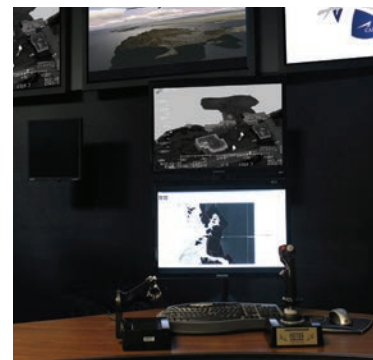
CAE's fixed-based UAS Mission Trainer with GCS is the full-size host with multiple image generators and servers. The GCS enables students to train and rehearse in a fully immersive virtual environment that replicates the operational environment.

Aircraft-Specific UAS Training Solutions

The CAE UAS Mission Trainer can be customized to represent a specific UAS aircraft platform.

An aircraft-specific CAE UAS Mission Trainer features the following:

- ▶ Aircraft-specific operational scenarios
- ▶ High-fidelity, accurate sensor training
- ▶ Mission training and rehearsal



UAS Mission Trainer

Aircraft-Specific

CAE's aircraft-specific UAS Mission Trainer is a solution that helps optimize operational readiness while minimizing the use of live assets to train and prepare the integrated mission team for operations. The comprehensive solution also prepares the integrated mission team (pilot, payload specialist, and commanding officer) in platform operating procedures, data interpretation and analysis, and team interaction. CAE's comprehensive training solution provides a complete mission training environment with a capability to interconnect with other simulators or trainers.

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UAS Aircraft-Specific Examples

Predator Mission Trainer (PMT)

Based on General Atomics Aeronautical Systems data and CAE's high fidelity simulation models, CAE's Predator Mission Trainer is matched to a test guide that validates aircraft performance.

Benefits:

- Improved ground manoeuvres
- Improved ground effect simulation on takeoff and landing for better launch and recovery training
- Simulation of the complete flight envelop and various degraded conditions and environmental effects
- High fidelity sensor and payload simulation
- Synthetic Environment using CAE STRIVE CGF and CDB databases
- CAE Medallion-6000 image generator



TigerShark XP Mission Trainer

Based on NAVMAR data and CAE's high fidelity simulation models, CAE's TigerShark XP UAS Mission Trainer matched to a test guide that validates aircraft performance.

Benefits:

- Integrated with next-generation universal Ground Control Station
- A new and improved instructor operator station
- The option to switch between real and synthetic environments
- A transportable total training system



Beyond training

Extending the use of simulation

CAE's UAS training solutions can be used as a planning and analytical environment to assess new systems and payloads as well as for mission planning.

As a mission planning tool, CAE's UAS training solutions allows mission commanders to assess mission plans, thus ensuring the right assets are working optimally to ensure mission success. Within the synthetic environment, the team can rehearse the mission scenario prior to operations to identify any potential risks to the mission and alter plans and tactics accordingly for increased mission success.

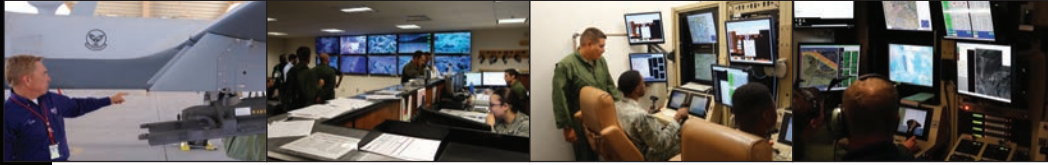
CAE's UAS training solutions can also be used as part of a systems integration laboratory, extendible to support option analysis, operational concept development, and system evaluation and integration. Simulation plays a key role in supporting acquisition teams as they evaluate different UAS platforms for integration with existing capabilities. Scenario-based analysis can be conducted in the synthetic environment to assess platforms and payloads capabilities to meet mission requirements. The valuable data provided to decision-makers allows them to choose the most efficient and effective platform to accomplish their mission.

In-Service Support Services for Unmanned Systems

As a world-class training company, CAE has extensive experience in supporting and delivering training programs. The company offers a range of training support services, including:

- › Facility design and management consulting;
- › Simulator and academic instruction (including pilot, crew, and maintenance technician training);
- › Equipment maintenance and operation;
- › Training centre operation and management;
- › Upgrades and modifications;
- › Logistics support;
- › Technical publications;
- › Courseware development;
- › Computer-based training;
- › Distance learning;
- › Training device relocation and re-qualification;
- › Systems engineering and software support.





Program examples



Italian Air Force

CAE is developing a Predator UAS Mission Trainer for the Italian Air Force.

The high fidelity UAS Mission Trainer specifically represents the Italian Air Force's General Atomics Predator A and Predator B. In partnership with General Atomics and the Italian Air Force, CAE is conducting flight test data gathering on actual Italian Air Force Predator aircraft to ensure the highest fidelity simulation of flight systems and sensor payloads. The high fidelity Predator UAS Mission Trainer will be delivered in late 2016 to Amendola Air Force Base and will enable the Italian Air Force to conduct "zero flight time" training for their Predator pilots and sensor operators, thus allowing a rapid transition to flight operations without further training on the actual aircraft. In addition, the zero flight time (ZFT) training capability is expected to significantly enhance operational readiness and flight safety for the Italian Air Force compared to conventional approaches to live training.



U.S. Air Force


CAE is the prime contractor providing the U.S. Air Force with comprehensive Predator and Reaper remotely piloted aircraft (RA) aircrew training services.

CAE is responsible for delivering aircrew training to more than 1,500 U.S. Air Force MQ-1 Predator and MQ-9 Reaper pilots and sensor operators annually. CAE provides academic (classroom), simulator, and live flying instruction on the USAF MQ-1/MQ-9 program, which is the world's largest remotely piloted aircraft training program.



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