

# UAV Simulator



CAE's high-fidelity UAV simulator is an integrated product that combines a vehicle operator station with a synthetic environment to support UAV (unmanned or uninhabited aerial vehicle) research, training and operations.

The ground control station (GCS) can be switched to control either a real air vehicle in the real mission space or a simulated air vehicle in a synthetic mission space, while providing the operators (air vehicle operator and mission payload operator) with a consistent interface. In the synthetic mission space, the simulated air vehicle(s) operates against simulated terrain, weather, and computer generated forces (CGF). A mission management station permits the mission space and exercise scenarios to be prepared and monitored.

## Synthetic environment

The synthetic environment provided with the UAV simulator is based on CAE's STRIVE framework. CAE STRIVE is the development and run-time framework for the modeling and simulation (M&S) community for building component-based, distributed, HLA-complaint simulation solutions.

CAE STRIVE is a development environment for modeling and simulation applications. CAE STRIVE significantly shortens the development cycle allowing developers to focus on building models without concern for how the models communicate, interact and perform in real-time. In addition, CAE STRIVE helps reduce new development through use of the available libraries of full fidelity, physics-based models; and promotes reusability and integration of legacy models through the use of wrappers.

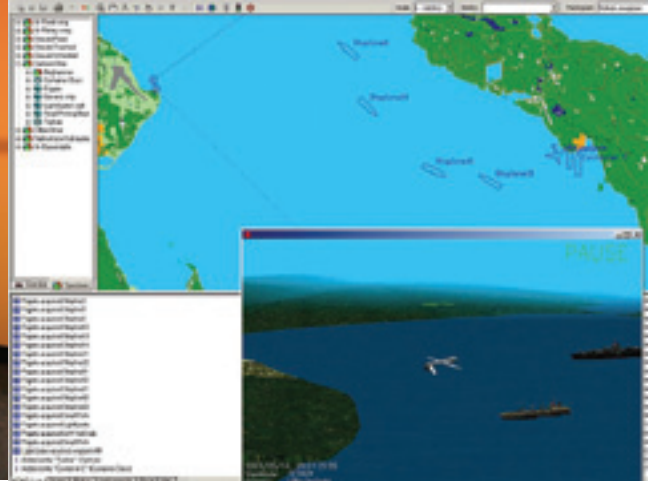
## UAV life cycle support

The multi-purpose nature of the UAV simulator permits it to be used throughout the UAV life cycle, from operational analysis and platform definition to acquisition and operator/mission training. Typically, the life cycle phases are as follows:

- Needs analysis and definition
- Iterative design
- Acquisition
- Training
- Operations

## Ground control station

The synthetic environment is integrated with the vehicle control station (VCS) software from CDL Systems Ltd. The VCS is used in a variety of unmanned vehicle systems, including the ground control station for the U.S. Army Tactical UAV (TUAV). The VCS is designed to be compatible with the STANAG 4586, which promotes the interoperability of ground stations and air vehicles



## Features of CAE's UAV simulator

- Low cost, low risk approach to UAV evaluation and testing
- Modular – major components can be added or replaced as required
- Reconfigurable – can be adapted to the need at each life cycle stage
- Open architecture – use off the shelf components and industry standards
- Mission management station – create and manage exercises
- Designed for STANAG 4586 compliance – switch between real and synthetic environments

## Program example – Canadian UAV RTB

The Canadian Forces initiated a project to conduct concept development and experimentation of uninhabited air vehicles (UAVs). The objectives of this project are to evaluate the potential for UAVs to be used in service, and to help the Canadian Forces develop expertise that would eventually lead to the purchase of UAVs. To support the concept development and experimentation project, Defence Research and Development Canada Ottawa – (DRDC Ottawa) is making extensive use of modeling and simulation technologies to support and improve the eventual acquisition process.

CAE was selected to help DRDC develop and deliver the UAV research test bed using some of CAE's existing modeling and simulation development tools, such as STRIVE<sup>1</sup>, the vehicle control system from CDL systems, as well as modules developed specifically for UAV applications.

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