



KONGSBERG

SIMflash

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Joint Strike Missile Mission Simulator

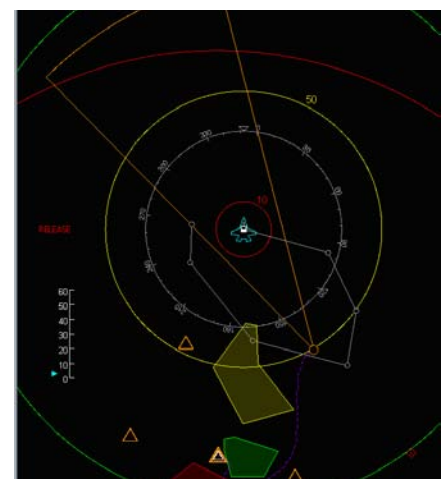
Simulation & Training has over the last 8 months together with the KDS Missiles & Space department developed a simulator to be used to support concept development of the mission planning functionality in the new Joint Strike Missile (JSM).

The simulator is a concept of operation emulation of the pilots tactical display in order to determine what type of information the missile should present to the pilot in the F-35 Joint Strike Fighter during mission planning and mission execution. The simulator will also be used to determine which parameters it is sensible for the pilot to adjust and which parameters should be set as default given the chosen mission.

The simulator is based on the multiplatform infrastructure from Battlespace Synthetic Environment (BaSE) and is implemented as a multiplatform application using Qt.

The main view for the operator is an emulation of the screens in the F-35, where the pilot monitors his tactical display and operates the weapon display. In the weapon display the pilot selects type of weapon. When JSM has been selected the pilot may select a pre planned mission or he may select parameters to be used to generate a new mission. In the tactical display the pilot gets information about targets, zones, aircraft and missile routes, missile range, launch area and other mission critical information. In this display the pilot may

select new targets, set route points and start the generation of new missions or select to launch a mission.



Tactical Display

A realistic synthetic env



The BaSE (Battlespace Synthetic Environment) Visual System, made by KONGSBERG Simulation & Training, displays high fidelity computer-generated images using COTS PC workstations or laptops. The visual software is based on the open source product Open Scene Graph and the OpenGL 2.0 industry standard. This ensures a system that has adaptability and compatibility with future technological advancements in image generators. The Visual System is developed as multiplatform technology and supports both Windows and Linux.

The Visual System uses a terrain database to represent the static information in the scene, while the moving objects (aircraft, helicopters etc.) are provided as individual 3D models. Depending on the provided data, and the tool used for terrain generation, a set of terrain features is included into the terrain databases. To enhance the realism and increase the level of fidelity a set of effects is added to the visual image.

The visual system provides an extensive range of features and capabilities, creating

a realistic synthetic environment for the trainees. This includes buildings, roads and humans, military and civilian vehicles, hovering and flying helicopters, trees, bushes and other terrain models. Targets, once hit, are indicated with flames, damaged target models and smoke effects. Muzzle flash from entities and humans firing weapons during the exercise are also visualized as well as IR-view of the environment and models.

The key features of the synthetic natural environment created within the Visual System include:

- **Diurnal effects** – time-of-day model ranging from dawn, day, dusk to night, with varying ambient and direct sunlight.
- **Environment** – sun, moon, stars and planet positions based on geographical position and time of year and day.
- **Visibility** – clear, haze, precipitation (rain/snow) and varying density fog.
- **Sky** – clear, overcast, clouds with varying cloud height and ceiling.
- **Water simulation** – reflection,

refraction and wave visualization. The water simulation also provides realistic movement of sea entities.

- **Animations** – for movements such as rotor blades, rolling tracks and wheels and character animation and transitions.
- **Articulations** – moving turret and guns, and other articulated parts.



Environment for the trainees

- **Shadows** – dynamic shadows from clouds, terrain object and simulated entities.
- **Special effects** – fire, smoke, explosions, ground detonations, tracers, muzzle flashes, snow effects and smoke grenades. Effects such as smoke and clouds are affected by the wind parameters.



3D models with special effects

- **Sensors** – thermal far-IR sensor with dynamic IR signature and visualization with contrast, brightness and polarity adjustments.
- **Dynamic IR signature**
- **Dynamic terrain** – real-time modification like craters, ditches, barriers, bridges and track marks to the terrain.



Water simulation and individual 3D models

- **Light sources** – External entity lights, street lights, etc.

BaSE is extensively used to develop and deliver training systems for Air Defence, Combat Vehicles, Gunnery training and Naval Warfare training for customers world wide.



Combat Vehicle Training System

Kongsberg Defence Systems - Simulation & Training has developed a new Combat Vehicle Trainer for armoured vehicle personnel. The trainer is a complementary product to the PROTECTOR Training System family. The demand for a generic Combat Vehicle Trainer has in the past year grown as a result of the thousands of KONGSBERG PROTECTOR Remote Weapon Stations being fielded on multiple platforms around the world.

The focus for KONGSBERG has been to develop a low cost, generic and mobile training solution, to enable the crew to train both inter-crew communication and coordination procedures and synchronization of effort for target detection, acquisition and engagement.

The new trainer comprises the

following basic positions:

- PROTECTOR RWS Gunner
- Crew Commander
- Vehicle Driver
- Additional sensor operator position.

Other positions can easily be modelled and integrated.

The system has a modular and generic infrastructure and can easily be configured for the right vehicle and sensor suite. The Combat Vehicle Trainer can be networked, allowing several vehicles to operate in the same exercise to support tactical training at the section, platoon or company level. The Combat Vehicle Trainer is based on existing, well proven hardware and software from KONGSBERG. Several existing and new customers have shown great interest in this product, and you can expect to see the trainer at upcoming shows and events in the near future.

Upcoming Events 2010



From ITEC 2009 in Brussels

Simulation & Training (S&T) will be attending several events in Europe and in the US this year. We're starting with AUSA Winter Symposium & Exposition in Fort Lauderdale, Florida 24-26 February. The Winter Symposium and Exposition is a meeting place for all AUSA members, employees or consultants of AUSA Member companies, military and civilian government personnel, invited guests, and non-members that are interested or have an identifiable relationship with AUSA or the United States Army.

S&T will be a part of the Kongsberg Protech Systems (KPS) booth, and the main focus will be the Gunner Skill Trainer, the Computer Based Training and the Interactive Maintenance Library. Visit our stand #523 & 3327 Outdoor!

S&T will also exhibit at ITEC this year in London from 18-20 May. ITEC has earned its position as the most important Simulation & Training trade show in Europe. KONGSBERG have chosen to

continue the success at ITEC by demonstrating capabilities and products to potential customers and partners. This year KONGSBERG will, among other things, demonstrate a Generic Crew Trainer for Combat Vehicles. Visit us at stand #G108.

KONGSBERG has enjoyed great international success with the gunnery simulator for the PROTECTOR Remote Weapon Station. The PROTECTOR Training System is the most complete and innovative system within electronic training in this market. PROTECTOR Training Systems are supported by the State-of-the-art BaSE simulator technology including CGF engine and an upgraded visual simulation based on OpenScenegraph.

We would like to encourage our present and potential new customer to contact us prior to the trade fairs, to allow us to set aside time for a demonstration.

Upcoming Events 2010 for S&T:

- AUSA - 24-26 February
Fort Lauderdale, FL, USA
- ITEC - 18-20 May
London, UK
- Eurosatory - 14-18 June
Paris, France
- AUSA Annual Meeting - 25-27 October
Washington DC, USA
- I/ITSEC - 29 November-2 December
Orlando, FL, USA



From I/ITSEC 2009 in Orlando, Florida