

DEFENCE



CAPABILITY APPROACH

MODELLING & SIMULATION

FRENCH EXCELLENCE
IN DEFENCE AND SECURITY

GICAT

The French land defence and security
industry association



GICAT.COM

INTRODUCTION

THE FRENCH ARMY'S OPERATIONS SIMULATION SYSTEM

The French Army's operations simulation system addresses three interrelated issues:

- the responsive evolution of operational requirements:
 1. for preparing forces;
 2. for supporting operations;
 3. for preparing the future;
- the rapid development of dual-use technologies that can support these three requirements;
- the erosion of the resources (human and financial) available to meet them.

System design is approached by the Army with a comprehensive and proactive approach to streamline, in the long term, the four primary capabilities that require investment:

- the organization dedicated to system creation and implementation;
- management of a dedicated human resource;
- equipment acquisition;
- support system acquisition.

Derived from the SCORPION program and supported by the joint rationalization program for operational simulation, the creation of an efficient Ground operations simulation system is based on:

- achieving a common simulation core to allow for internal and external developments;
- distributed or network-based simulation for combined training in garrisons;
- on-board simulation for equipment appropriation and an increased use of simulation;
- instrumental simulation, which is essential to soldier resilience acquisition.

SIMULATION AND SUPPORT FOR OPERATIONAL READINESS

Force preparation is based on the rational use of simulation in education and training processes that emphasize using the most suitable tool for the intended educational effect. Whether supported by simulation tools or not, the acquisition of the skills and abilities required for the military profession involves four stages, three of which are conducted

within the context of operational readiness. The French Army's operational simulation system is thus based on three areas for using the force preparation system. These three areas are differentiated by the human abilities they strengthen and the complexity of the restitution framework they impose. The developments required for a responsive evolution of the operational simulation system are split between industry and the Ministry of Armed Forces to maximize efficiency: »each in its own role, each has a role to play«.

Operational readiness includes all education and training tools and processes with a single purpose: combat. For decades, the cavalry has used simulation at all stages of this process. At the Cavalry School, a wide variety of systems are used in the training curriculum and allow for focused and progressive learning. Virtual simulators for weapons systems are supplemented by constructive simulation connected to operational information systems. This simulation develops tactical expertise and ownership of digitization in a realistic, plausible environment. It allows for role-playing in operational situations in digitized platoon, squadron (SGTIA) and regiment (GTIA) environments. In cavalry regiments, the continuum of allocated resources enhances the ability to prepare for combat as a result of efforts made for decentralized, combined training. Upstream of indispensable field exercises using real equipment, the NEBSIMU Collective Instruction Area gradually increases unit freedom of action such that they may, in garrison, complete tactical training and maintain their skills in a digitized context. The multi-site distributed simulation and interconnected platforms with shared simulation, including with our allies, such as the 3rd Hussars of the Franco-German Brigade, opens up new perspectives. In specialized centers (CENTAC, CENZUB) the synthesis pole simulation provides units with the ultimate tool for assessing levels. Simulation constitutes a necessary but insufficient support for preparing combat, especially for armored units.

SIMULATION AND OPERATIONAL SUPPORT

Simulation for operational support uses the same tools as for operational readiness

As part of operational support, simulation is an emerging solution that fits into the mission design, command and operation process. In addition, simulation capabilities may also be used:

- to test new modes of action in response to those implemented by the enemy;
- to maintain the know-how acquired during operational readiness, particularly when the tactical situation does not allow some capabilities to be deployed outside operational bases;
- to quickly appropriate new features offered by the weapons systems purchased within the context of reactive adaptation.

The diagram below lists all used simulation cases for operational support and provides simplified mapping of tools that meet requirements, by level.

Operational support is a set of processes and emerging tools that aim to strengthen combat force capabilities just before, during and immediately after combat. In design, they allow users to make better decisions faster than the opponent (tools for 3D terrain analysis, wargaming and optimization of JCS collaboration). In command, they provide insight into the situation to operate more efficiently and reliably. In operational lulls, they help maintain troop tactical know-how and techniques, to appropriate new know-how or techniques or examine lessons learned from recent combat. The operational benefits of simulation in operational support will be obtained if and only if information systems and simulators are fully interoperable, and if man continues to make decisions, and not the machine. The challenges are both technical and psychological. The use of simulation for operational support is conditioned by the level of control and user adoption during peacetime. The latter is closely linked to system ergonomics, which, like for smartphones, must be transparent to the user.

SIMULATION AND SUPPORT IN PREPARING THE FUTURE

Tactical experiments are essential to developing the doctrine of an Army that is constantly evolving. However, the human and financial burden of such experiments often requires reducing them to a minimum.

Virtual or constructive simulation provides an opportunity to effectively experience most new tactical methods, including those performed on weapons systems that are still being specified. Subsequently, they must only be validated in the field during training exercises. The Army therefore uses simulation to support the drafting and testing of its doctrine.

The expertise of SCORPION combat, which is currently being deployed, will rely on simulation tools and doctrinal studies that will use virtual and constructive simulation.

Since 2013, the CDEC has been developing the GTIA SCORPION doctrine for use. To provide instructions adapted to the use of this future tactical tool, this document explores innovative used solutions, combining the new capacities delivered by SCORPION and tactical lessons learned from recent operations. In the past, to prepare the arrival of SCORPION and in order to test the doctrinal principles, the CDEC launched an experimental simulation campaign based on various systems: TOL of CATOD or OPOSIA for example. In parallel, the CDEC conducted tactical testing at DIA, SGTIA and, subsequently, GTIA level, with partner units. The application of the teachings derived from these additional has contributed to provide a functional SCORPION doctrine.

The Directorate General of Armaments also uses simulation to specify weapons systems, test implementation solutions and contribute to understanding capability issues. The Technical Operational Lab (TOL) can meet some or all of these needs. As an entity for study and experimentation

within the Ministry of Armed Forces, the TOL makes it possible to measure ideas, thereby contributing to strategic decisions regarding military capabilities, and to comprehending operational requirements by involving the DGA, armed forces or members of industry.





4 The TOL develops and implements innovative methods to simulate actual or anticipated combat situations for armed forces. It thus contributes to the decision-making process. These methods are based specifically on the combination of collaboration techniques, system engineering and situational role-playing using simulations and experiments that account for human factors. Studies conducted in integrated operations engineer teams are multidisciplinary and can cover a wide range of issues across all primary capabilities. Work is based on the assessment of these capabilities, using a tool-based and iterative approach, with scenarios that represent operational conditions.

The TOL therefore provides methods and organization for conducting these studies and experiments by putting operational issues at the forefront.

In providing elements for choice and decision making within the context of work on future military capabilities, the TOL is an essential resource for operational coherence officers at the Armed Forces JCS and force system architects at the DGA. EVITAC experiments, conducted for the French Navy and presented at the DGA's SimDef stand at Eurosatory in the past, is one example that illustrates the benefits of this approach. The TOL continues to gain momentum, by increased participation of Technical Directorate centers within the DGA, and in particular through the creation of specialized workshops by area of expertise and background.



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4D VIRTUALIZ

Simulation Design
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& Validation

Being able to use remotely-controlled or autonomous vehicles such as UGV and UAV or surveillance applications represent a strategic advantage. 4D|Virtualiz develops software solutions to promote the development of these robotic technologies, for defence purposes.

SIMULATION FOR ROBOTICS & A.I.: VEHICLES, UGV, UAV & SECURITY APPLICATIONS

SIMULATE TO TEST, IMPROVE & USE YOUR SYSTEMS

Expert of functional modelization and simulation of sensors data, 4D|VIRTUALIZ offers a large panel of simulation software to answer needs of development robotic applications and support you in that field.

With this framework of simulation, you can create a real functional numerical twin from your real vehicle, using high fidelity sensor models designed for the development of your algorithms (perception, servo, control, communication).

This workflow using simulation and testing has three effects: optimize, secure and boost your process.

Finally, thanks to its natural capacity to create Hardware-in-the-Loop simulations, you have the capacity to accelerate your process by connecting the embedded hardware and software, the FPV controller of your instrumented vehicles.

Furthermore, you can create and automatized a wide variety of tests to evaluate the reliability of your systems, disrupt your algorithms thanks to functional, contextual, meteorological or specific disturbances, in the early design stage.

For late-stage trials, you can transfer all your developments to the real system, thanks to the Plug&Play technology.

ANALYZE AND INCREASE RELIABILITY

4DV|SIM gives the opportunity to edit, script, emulate, process and analyze the results of your simulations:

- **4DV|SystemDesigner** lets you import your CAD models for a functional and realistic simulation;
- **4DV|Editor** gives you the opportunity to create test scenarios. You can use your 3D resources, a large panel of emulated sensors and interface with your systems your FPV controllers;
- **4DV|Simulator** runs the real-time 3D simulation while offering Hardware-In-the-Loop capacities;
- Using **4DV|Monitor** allows you to visualize data generate by the sensors used by your instrumented systems, a C2 view allow you to visualize all the scene and manage agents during the simulation to act on the scenario of simulation;
- **4DV|Batch** brings variability to the scripts by creating experience plan;
- All produced data can be processed and analyzed using **4DV|Analyser**.

4D|VIRTUALIZ, as expert in simulation, robotic systems and sensor's data processing, is able to advise and support in all stage of your projects.



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AGUERIS

A JOHN COCKERILL DEFENCE SUBSIDIARY

YOUR EXPERT IN SIMULATION FOR DIFFERENT AREAS SUCH AS ARMORED VEHICLES, UAV AND VIRTUAL MAINTENANCE TRAINING SIMULATORS (CIVILIAN AND MILITARY SOLUTIONS)

MILITARY ARMORED VEHICLE TRAINERS

To prepare your military forces for their operational missions. Our simulators configurations are modular to fit your operation training deployment needs: classroom, embedded, shelters...

- **Virtual cockpit:** a fully immersive & interactive 3D virtual environment.
- Perfect to provide training **for individuals, crews and platoons.**
- UX-designed **instruction features:** After Action Review, debriefing, trainee monitoring and exercise creation and animation.
- **One simulator** fits for different weapon systems.
- **Different versions** proposed: classroom, embedded simulators (unique plug and play system on turrets), shelters, etc.

UAV SIMULATORS

To prepare UAV crews to operate your UAV critical functions:

- Generic, modular and reconfigurable solution for multiple UAV simulation;
- All operators functions, navigation and emergency procedures and tactical training recreated, for ab-initio to expert training;
- Based on a full-featured simulated Ground Control Station (GCS) connected to a comprehensive and realistic virtual environment (includes a comprehensive Instructor Station to manage training session);
- High accuracy UAV models can be reconfigured to represent various drones and a large choice of operational payloads (EO/IR Camera, SAR/ GMTI, ComInt,...).

VIRTUAL MAINTENANCE TRAINER

A virtual development platform for desktop, mobile, augmented and virtual reality devices, designed for both maintainers and operators (for industry and military applications).

- High realism of Virtual Maintenance and Procedures Training.
- Field-proven training system with 100+ military and industrial references.
- Unique user-friendly database containing all requirements, 3D objects, 2D support equipment, environmental properties, behaviors and constraints.
- 100% safety training.

An international reference in simulation, AGUERIS, a full subsidiary of John Cockerill Defense, is expert in several countries for its training & simulation solutions. One goal, one mission: to optimize your operational efficiency through cost-effective training and simulation thanks to a complete range of innovative simulators for civilian and military applications.



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DCI

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& Validation

Created in 1972, Défense Conseil International (DCI) is a service provider, with the French State as reference shareholder. Its mission is to transfer French armed forces know-how to friendly countries. It offers customised solutions supported by high standard simulation means and an advanced simulation expertise thanks to its military specialists. DCI has more than 100 customer countries and 7 permanent offices abroad.

ARMED FORCES EXPERTISE AND OPERATIONAL KNOW-HOW

TRAINING, CONSULTING AND ASSISTANCE EXPERTISE

DCI as the reference operator of the French Armed Forces for the transfer of the military know-how is a major actor of simulation and modelling development.

Thanks to its operational military expertise and its partnership with the French military units and academies, DCI provides a wide range of training courses enhanced with simulation means in all the fields of activities from Air Mobility and Maintenance to Artillery and Cavalry.

DCI also provides consulting and technical assistance solutions in the development of simulation capabilities at each level of the training process from the tactical level to the strategic command one.

FRENCH ARMY CAPABILITIES

DCI can build up on the means and expertise of the French Army to provide tailor-made training with simulation solutions. High standard services are designed with pedagogical accent to improve your operational capabilities, covering the whole spectrum of land forces and airmobile fields:

- Helicopters;
- UAVS;
- Operational Maintenance;
- Artillery;
- Armour;
- Special Forces;
- Engineering;
- Intelligence;
- Cyberdefence;
- C2.



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Simulation Design
& Engineering



Simulation
Equipment

ECA GROUP

HIGH-END TRAINING & PRACTICE SOLUTIONS

ECA GROUP SUPPLIES OFF-THE-SHELF SIMULATORS FOR FLYING, DRIVING, MAINTENANCE TRAINING AND TACTICAL SIMULATORS FOR LAND MISSION TRAINING.

These simulators offer realistic training environments at both individual and unit level. Providing operational flexibility, ECA GROUP systems can be networked and used in combined training scenarios. The simulation significantly improves trainee skills, without risk to personnel and equipment, providing invaluable training at reduced costs.

ECA GROUP solutions are mission specific and designed to meet customer needs. From concept to delivery, ECA GROUP offers solutions from individual trainers to complete turnkey Training Simulation facilities.

As a pioneer in the simulation industry, ECA GROUP offers a wide range of driving simulators from light to heavy vehicle & motorbikes. Our considerable expertise combined with cutting edge technology enable to provide first class road simulators. The integrated educational curriculum contains various basic modules, prerequisites for the transition to the real driving conditions, oriented know-how, and other modules of development and awareness of specific behaviours, oriented know-being, validated by assessments.

MILITARY AND LAW ENFORCEMENT SIMULATION

ECA GROUP MVS™ - Military Vehicle Simulator, is a full scale replica of an armored vehicle placed on six degrees of freedom motion platform in order to simulate with accuracy the behavior of the vehicle in every kind of environment and situation. This driving simulator is available for autonomous driving training and practice at a platoon level, in a collaborative mode networked with other simulators. Effective driving training and practice for individuals or complete crews in a lifelike environment. The 3D geo-typical graphical database enables to practice on driving, missions, convoys or escorts. The training scenarios are configured and operated via an instructor station, with the possibility to integrate objects or trigger events in real time such as ambushes, breakdowns or suspect vehicles.

ECA GROUP developed a new simulator range «EF Emergency» to increase the proficiency of emergency response drivers and riders. Urgent interventions are the daily life of military and civil forces personnel drivers. They must reach their destination as quickly as possible while dealing with many constraints: Crew and vehicle safety, mission stress, speed, obstacles, traffic hazards, the road user behaviour etc.

The ECA Group is renowned for its expertise in robotics, automated systems, simulation and industrial processes. Ever since 1936 it has been developing complete innovative technological solutions to perform complex missions in hostile or restrictive environments. Its products are used by a demanding international clientele requiring the highest levels of safety and efficiency, mainly in the sectors of defence, maritime, aerospace, simulation, energy and industrial equipment.



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GDI SIMULATION



Located near Paris, GDI SIMULATION is a 100% subsidiary of MBDA specialized in live and virtual simulators for technical and tactical training. GDI SIMULATION is a strategic partner of the French Army for the training in the SCORPION transformation. Both companies leverage their expertise to offer in particular world-leading simulation for missiles (especially the latest MMP product).

PROVIDER OF LIVE AND VIRTUAL SIMULATIONS FOR ARMY TRAINING

ALL CALIBER UPTO 120 MM AND ANTI-TANK MISSILE

GDI simulators cover all type of Army weapons from assault rifle and 120 mm MBT to anti-tank missile. In addition GDI SIMULATION offers a comprehensive set of services to support installation and use of our simulators onboard vehicles as well as local MRO.

GDI PRODUCT LINES

Combat firing simulators (CFS):

They are used for tactical training of infantry and cavalry, in regiment or in training centers. Product line includes single way laser simulator for infantry, two way laser simulators for vehicles, and an innovative missile simulator combining laser mode and virtual reality mode to simulate beyond line of sight firing. They are key components for live cooperative combat training.

Gunnery training simulators (GTS):

They are intended to instruct soldiers in weapons handling and perform shooting training to improve the accuracy. Key assets for training center, Army schools and regiments, they use cutting edge technology especially 3D virtual reality engine to offer realistic scenarios and imagery. Our simulators can be connected through a common network to perform tactical training in full virtual reality.

Behavior & shooting training:

The Virtual Shooting Range (VSR) is intended for training in weapon handling, shooting, as well as behavioral training through realistic scenarios using artificial intelligence. These scenarios are adapted for security forces, police, armed guards and infantry.



GDI SIMULATION

GDI SIMULATION

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VIPER RELIABLE SIMULATORS: DESIGNED FOR MISSION READINESS

VIPER IS A PYROTECHNIC WEAPON SIMULATOR TO ALL TYPES OF VEHICLES (MAIN BATTLE TANK, INFANTRY VEHICLES, CARRIERS...).

With our VIPER IED simulator (2 or 20 rounds), we can provide the best realistic battlefield training in safe conditions.

VIPER simulator, can be use for Live Training and/or Live Fire Training, for all types of armed troops, from individual to units training forces... - Selected for CERBERE program.

VIPER OFFER A WIDE RANGE OF EFFECTS:

- Artillery effect;
- Tank cannon fire, hit effect;
- Masking, airburst effect;
- Bright flash, loud bang;
- Destruction, IED...

VIPER OFFER SAFETY AND REALISM WITH COMPACT EFFECTS:

- Long smoke duration, 25 sec up to 90 sec;
- Visual > 1500m;
- ~160 DB in 1m;
- Safety ammunitions (percussion);
- Security area up < 1m;
- MIL standard/STANAG 4370 ECTPs;
- Lifetime ~ 20 years.

Lacroix is one of the long-standing providers of training solutions to the French Armed Forces - our devices are used in:

Combat Training Center (Mounted or standalone on vehicles, buildings, etc or stand alone):

- Urban Area (MOUT);
- Regiments;
- Camps.

LACROIX

For close to two decades, Lacroix has invested itself in developing and providing technical solutions, delivering the most realistic and effective training for troop readiness. Though various means of training are available (shooting ranges, combat training centers, etc.), we consider that the most effective means combines the aspects of the environment (realism, stress, etc.), safety with a replication of realistic effects.



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MASA GROUP



Simulation
Software

MASA Group is a leading international provider of advanced software solutions, AI-based technologies and applied research for the Defense, Homeland Security and Emergency Management. Established for over 20 years, and based in Paris, France, MASA is a trusted developer of pioneering AI software which combines scalability, adaptability and low cost of ownership.

WORLD LEADING PROVIDER OF AI-BASED SIMULATION FOR OPERATIONAL READINESS

SWORD, AI FOR TRAINING AND DECISION SUPPORT

Developed in close relation with armies worldwide, SWORD is a cost-efficient constructive simulation focused on user needs. SWORD immerses brigade and division command post staff in large-scale conflicts, stabilization operations, terrorist threats or natural disasters, providing broader and more complete training solution that ultimately improves their decision-making capabilities. SWORD simulates an extremely diverse range of situations in highly-realistic environments and, powered by its unique Artificial Intelligence technology, lets trainees lead thousands of autonomous subordinate units on the virtual field. SWORD is a complete, high-level, automated simulation for cost-efficient training, analysis and planning.

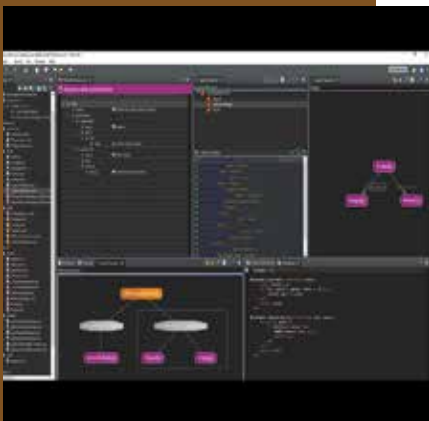
DIRECT AI, AUTONOMY AT THE CORE OF YOUR SYSTEMS

Based on our patented and proven technology, Direct AI is an AI engine which allows developers to design and deploy smart behaviors into any environment.

Originally developed as the AI engine for SWORD, growing demand for our AI software has led to its introduction as an independent product with the unique capability to be integrated with other products and applications. Direct AI allows modeling, design and development of rich behaviors through AI software agents that think and act with any degree of autonomy within a software environment.

Direct AI comes equipped with a modeling language, runtime, and a complete set of tools (editors, debugger, and profiler). Its two-level AI language allows non-programmers to compose existing behaviors easily.

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SIMULATION IS THE HEART OF OUR PRODUCT'S LIFE

CONCEPT PHASE

The **BASILIC** experiments are studies of concepts of future weapons systems with setting in situation of operational players in simulated but realistic tactical and terrain environment. It takes into account:

- Concept doctrine;
- Organization;
- Platform integration;
- BMS needs;
- Actors roles;
- Technologies;
- Human factors.

Those studies also allow **MBDA** to make systems integration and ergonomics works.

DEVELOPMENT PHASE

MBDA has developed numerical simulations for all its weapon systems which help during the development phase to qualify and validate the technical performances. HWIL simulation also allowed MBDA to validate and qualify most of the sub-systems of its missile systems.

TRAINING: TECHNICAL AND TACTICAL SIMULATORS

MINESOTA: MISTRAL simulator for individual or Collaborative Training, indoor with 100% immersive synthetic environment (potentially with a dome) and outdoor with augmented reality.

METIS: Indoor simulator for SIMBAD-RC (Naval turret for MISTRAL).

MPCV and ATLAS RC indoor simulator: simulator for individual or collaborative indoor training, with immersive synthetic environment.

SESAME MPCV: outdoor training, embedded in vehicle with Augmented Reality.

NETS: anti-tanks weapon indoor/outdoor training with augmented reality capability.

ATTACS: Instruction and training of hybrid/mixed combat units in realistic environments:

- Land Forces Tactical Training;
- Innovative & Advanced Modular Platform;
- Simulation of collaborative engagement between different systems (drones, mounted and dismounted weapon systems, coordination nodes,...);
- Open and scalable architecture;
- Realistic Synthetic land and maritime environment with wide library of 3D targets;
- "Plug & Practice" - Compatible DIS/HLA, VBS;
- Latest Technologies with Virtual Reality.

MBDA

In partnership with its domestic and export customers, MBDA has developed a comprehensive set of simulation tools and services that covers:

- Concept Phase, for studies and concept optimization;
- Development Phase, for performance guarantee and risk mitigation;
- Integration Phase, for integration and system validation;
- In service Use, for training and coaching.



MBDA
MISSILE SYSTEMS

MBDA

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NEXEYA

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HENSOLDT NEXEYA France is a French company of about 700 employees that designs, manufactures, tests and maintains critical electronics systems in the areas of Defence, Aeronautics, Space, Transportation and Energy. For Land and Airland Defence and Security, NEXEYA offers different product lines for the test, modelling and simulation of critical systems.



TEST, MODELLING AND SIMULATION OF CRITICAL SYSTEMS

SIMULATION OF CRITICAL OPERATIONAL SYSTEMS & MCO

ARGOSIA is an embedded multi-displays multi-users mission system dedicated to surveillance missions. Interfaced with on-board sensors, ARGOSIA allows the analysis of the image received, the situational awareness update, the video storage and the data transfer with ground assets. To ease critical systems commissioning and operator training, NEXEYA offers a simulation mode based on the synthetic environment VBS2/3 developed by BOHEMIAN INTERACTIVE.

It also ensure simulators refurbishment by maintaining in operational conditions and refurbishes training simulators ensuring the highest levels of availability and performances. Refurbishment samples:

- Simulator control/command of 3 axis C135 cockpits;
- Calculators;
- Mechanical subassembly of helicopter cockpits (simulator);
- Dashboards Simulation.

TEST SYSTEM FOR INTEGRATION & VALIDATION

ALYSA is our efficient solution oriented modeling, testing, integrate. Our platform covers the life cycle of your systems or equipment through the development, integration, production and operation phases. The modular and incremental approach allows you to cover the stages of SIL, MIL, HIL, system integration, with less effort, by capitalizing on a unique and therefore controlled environment.

Coupled with stress simulation systems, hydraulic or electrical, our platform provides capacity to submit your equipment to the simulation of constraints related to its employment environment (simulation of dynamic forces). Alysa has many references in the validation of computers, actuators but also of complete systems commonly called zero platform (such as the Iron Bird for the aeronautical field).

Through business-oriented software libraries, ALYSA addresses the defense and civil sectors, in the main fields of aeronautics, naval, transport and space.



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NEXTER SYSTEMS

ON-BOARD SIMULATION AT THE HEART OF FORCE TRAINING

SIMULATION SOLUTIONS PROVIDE TECHNICAL AND TACTICAL TRAINING

Thanks to augmented reality, it will be possible to display «avatars» on the real image of the viewfinder to create dynamic tactical exercises on all types of terrain. Current training capabilities are limited by the limited availability of specific simulators.

In the future, the capabilities will be larger, more flexible and, above all, more effective, while simplifying the training of forces.

Simulation can be carried out at two levels:

- Technical level within a crew;
- Tactical level by associating several platforms thus constituting a platoon.

For this purpose NEXTER's CREWTRAIN® solutions:

- Embedded Training, allowing to quickly transform an operational armoured vehicle into a simulator;
- Virtual Trainer, the two-seater cabin.

CREWTRAIN® is the product range for the operational preparation system. CREWTRAIN® is easy to use, interfaces with C4i, C2 and vetronics (FINDERS CS®) and allows the Armed Forces to train efficiently.

ON-BOARD SIMULATION A FEASIBLE AND ECONOMICALLY EFFICIENT MEAN

Nexter, which masters integrated weapon systems and is committed to a policy of innovation, is broadening its scope of action by offering on-board simulation for future and renovated vehicles.

The main product is on-board simulation (SEMBA), a feasible and economically efficient means of training:

- Perpetual simulation fidelity (TRAIN AS YOU FIGHT):
 - The vetronics (hardware and software) is reused as much as possible for a perennial simulation fidelity;
 - Direct optical channels are integrated into the simulation by two different means (augmented reality helmet, video epsicopes);
- Economy of means (TRAIN MORE FOR LESS):
 - Fewer engine hours, less ammunition, no movement of personnel in training centres;
- Small footprint and user-friendly (TRAIN ATAWAD):
 - Improved crew coordination and cohesion through the ability to train more often in the vehicle (one vehicle or several connected vehicles);
 - Exercises controlled by a fixed or mobile DIREX (tablet);
- Mastery of the SEMBA/OPS scale (TRAIN SAFELY).

Widely used for tactical platoon training, chain-of-command training or simply for driving armoured vehicles, simulation is a cost-effective way to train soldiers. Advances in technology allow us to consider these integrated simulation functions in future vehicles. Nexter also offers the 3D digital sand box, FINDMP.



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nexter K+D+S
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RUAG DEFENCE FRANCE

Simulation and Aids for Firing Instruction and Training. Founded in 1983, RDF is a French company that specializes in simulation systems and equipment for firing instruction and training. RDF has been integrated in RUAG Group since November 2013. Management, design, production and in-service support of products. The right military expertise.

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- Built to fulfil the best in class of performances on the market.
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- High fidelity tetherless full replicas.

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- Naval close range combat training simulator.
- 270° projection on motion.
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- Artillery forward observer training simulator.

STES VBCI

- Infantry fighting vehicle combat simulator.
- Gunner / commander shooting to platoon tactical training.

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- Extended set of on-field equipment and battlefield effect simulators for soldiers, vehicles and building available.

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- Soldier tactical engagement simulator.
- Compact, light and accurate solution adaptable to all small weapons and light arms.

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Simulation
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TOUTENKAMION GROUP



Simulation
Equipment

Your simulator in a mobile solution. Our mobile units can be deployed as close as possible to your forces in order to prepare or maintain their training, from their base or in the operational field. Ultra-fast deployment time, severe environmental constraints, autonomy... Our achievements provide innovative and quality solutions to meet these requirements.

TOUTENKAMION GROUP, A KEY MANUFACTURER FOR ALL YOUR MOBILITY PROJECTS

DESIGN CAPACITIES, TECHNOLOGIES, TAILOR-MADE

Toutenkamion Group is a French group in full expansion with a turnover of 24 M€, and a workforce of 230 employees. It's **the European leader in design, manufacturing and transformation of truck cabs, mobile units and shelters.**

With our means, our know-how and our experience, **we support you from the study to the homologation/qualification of your solution.**

Thanks to our design capabilities and the variety of technologies we master, **we cover a wide range of operational applications.**

The aluminum or polyester composite technologies we use for our large size panels, combined with adhesive bonding or continuous welding assembly processes, ensure the **operational efficiency, light weight, strength and durability of our products.**

MAKE YOUR SIMULATOR MOBILE

Make your simulator mobile to **move it as close as possible to military staff or anywhere you want.**

Thanks to **mobile simulators, keep** your teams **operational, train** them in **new technologies, do prevention.**

According to your needs, we offer our **mobile units** in **several formats:** carrier, semi-trailer, shelter, extensible or not.

Our mobile units can be used for **a wide range of training courses,** such as:

- **Military training:** tank driving simulator, command and information systems simulator, firing simulator...
- **Driver training:** lorry, light vehicle, two-wheeler, train...
- **Medical training:** operating room simulator, patient simulator...
- **Fire training:** fire simulator, smoke propagation, rescue...

We have **already delivered these different mobile simulators** for simulator manufacturers, defence industries, defence government departments and services.

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The French land defence and security
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