

DEFENCE



CAPABILITY APPROACH
FIRE SUPPORT

FRENCH EXCELLENCE
IN DEFENCE AND SECURITY

GICAT

The French land defence and security
industry association



GICAT.COM

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INTRODUCTION

FIELD ARTILLERY: THE HEART OF LAND FORCES FIREPOWER

ATTACKING THE ENEMY'S COMBAT POWER, UNDERSTANDING, WILL, AND COHESION.

Often delivered by joint assets, Fires are defined as the use of weapon systems to create a specific lethal or nonlethal effect on a target. Using fires will be central to the commander's plan. Fires provide him with the ability to reach the enemy to deliver physical effects (such as destruction or attrition) or psychological effects (such as lowering morale) but also, with movement, to support maneuver giving that position of advantage.

Amid the land forces, Field Artillery provides the targeting, integration, coordination and delivery of fire support. Artillery provides equally the land component own Air Defence.

1 FIRE SUPPORT

Fire support is defined as the application of fire, coordinated with the manoeuvre of forces, to destroy, neutralise or suppress the enemy.

Targeting of firepower is central to its effect and legitimacy. It is subject to detailed processes at every level of operation.

Integration

Under the responsibility of the ground forces commander, using artillery weapon systems requires an effective airspace management to coordinate the wide bunch of activities occurring above the force (air fighters, helicopters, missiles, unmanned aerial systems, shells, etc.) and minimise fratricide risk. High-level headquarters use information management systems to support the coordination of those high velocity assets.

Coordination of fires delivery relies on the operational principle of centralised control, decentralised execution. In the fast operating combat environment, the ground forces commander uses dedicated command and control communication systems to assign tasks to the required artillery assets.

2 AIR DEFENCE

Air Defence is considered for the defence of point and area of vital interest. When unit or object oriented, the aim is to protect functionality. When area oriented, the goal is to maintain own freedom of movement by denying the opponent air presence above that area. Air defence artillery is deployed where required among the land component forces.

3 CAPABILITY AND EQUIPMENT

A **large range of assets** exists on the ground to strike high in the air or far in the depth. It allows the ground forces commander to deliver hasty repost fire (counterbattery), surgical strike on a single target or massive shelling to deter any move of the opponents. Usually artillery regiments and battalions deploy comprehensive capacities made of one or more of the following assets:

- command and control systems for coordination by the Headquarters;
- RADARS for target acquisition, air defence or counterbattery;
- long range rocket launchers and ammunition for precision strikes in the depth in all-weather condition;
- mortar, howitzer and ammunition (120 mm and 155 mm shells) for precision or saturating attacks;
- unmanned aerial systems as support of target identification and acquisition or fire delivery;
- air defence artillery, with guns or missiles, for force protection.

FIRE SUPPORT

COMPONENT BREAKDOWN



SENSORS: TARGET ACQUISITION CAPABILITY

In order to detect and identify threats, designate targets and observe the firing results to assess damage and rectify elements transmitted to launchers of the battery, the artillery uses Observation Teams (EOC), deployed inside the combined arms units (Infantry, Armor), with their own equipment capable of performing the tasks described above. Optical and optronic equipment is currently installed on board vehicles with observation devices, able to detect and locate targets both day and night. Observation Teams, mounted or potentially dismounted, use high-accuracy rangefinders and can be equipped with laser designators.



EFFECTORS & FIRE PLATFORMS

Indirect fire support is provided by guns, mortars and rockets. French Artillery is equipped with three types of launchers:

- 155mm 52 caliber self-propelled CAESAR guns capable of high strategic mobility and 38 km range;
- 81 and 120mm towed mortars, which deliver an effective fire support for units in contact up to 15km;
- unitary Rocket Launchers mounted on tracked platform, with a range of 80 km and metric precision;
- mistral 2 and 3 short range Missile System for Air Defense.

These launchers may be used as adaptable modules (unitary, dual, a battery of 6 to 8 launchers or a regiment 2 to 4 batteries). More often, before deployment, a reconnaissance team identifies firing positions where launchers can fire immediately when rapid deployment in action is decided. Some launchers are equipped with autonomous maneuver and firing capabilities, via inertial navigation systems and integrated firing calculator.



FIRE COMMAND & CONTROL SYSTEMS

The ability of the artillery to engage targets in neutralization or precision firing and to fire on-target immediately is allowed by transmission in near real time of data provided by observation teams to firing launchers and calculation of position and trajectory data provided by the artillery fire command and control system. Calculators are used at the battery command post and are also available inside the firing platforms, to provide unequalled scalability and versatility. The fire control system is also used to calculate ammunition replenishment. It must also interface with the 3-D Air Traffic and Air Defense management systems to optimize trajectories in airspace.



STRIKE EFFECTIVENESS






The artillery is equipped with a full range of 81, 120 and 155 mm caliber ammunition, for neutralization, illumination, blinding and warning. It is also provided by guided, selective anti-tank rounds for use in all types of conflicts. URL rockets guided by GPS allow protected targets to be destroyed at up to a distance of 80 km and with nearly metric precision. Current studies focus on guided 120 mm and 155 mm shells, which will be available after 2020.



REPLENISHMENT & LOGISTICS

After firing, munitions must be replenished by transportation and logistic units to the areas managed by artillery units. In addition to transportation and storage, munitions management.

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ACTIA TELECOM



Sensors:
target
acquisition
capability

ACTIA is an international and family-owned company which has a great expertise in designing, manufacturing and supporting customized solutions for satellite telecommunications (satcom) for defense and governmental markets. With 24 companies in 16 countries and 3800 staff, ACTIA has based its growth on commitments: innovating, manufacturing, creating values, demanding quality and staying independent.

SATCOM SOLUTIONS DESIGNER, MANUFACTURER AND INTEGRATOR FOR DEFENSE

RUGGEDIZED AND FIELD-PROVEN SATCOM TERMINALS

ACTIA Telecom offers a wide range of robust and easy-to-use satcom terminals and systems guaranteeing secure 2-way transmissions of video, voice & data in C, Ku, X, Ka, Q, V Band and dual band (X/KA). Compatible with any modems.

- TravelSat: compact manpack terminal.
- FlyAwaySat: easily transportable terminal.
- MobileSat: low profile, light weight On-the-Move terminal.
- CoreSat: earth station with 1m to 9m antennas with manual or automatic pointing.
- ACTIA Satcom network monitoring system which offers operators simple and effective means of monitoring and controlling a satcom ground segment and its network of terminals.
- ACTIA Telecom also provides its customers with all the support they need in the design and acquisition phase and during operation: engineering, training, hotline and maintenance.

RELIABLE PARTNER FOR DEFENSE OPERATORS

For almost 50 years, ACTIA Telecom's offer in the Satcom Defence field includes supplying major products for the ground segment of satellite transmissions (power amplifiers, integration assemblies, supervision systems, etc.), supplying turnkey stations (stationary, transportable, tactical and mobile stations) and providing the related services: engineering, installation and implementation, training, maintenance in working condition.

ACTIA Telecom brings the following key benefits to its clients:

- Sector experts: land, maritime, air and space;
- Dedicated industrial site for Satcom: R&D, manufacturing, integration, qualification capabilities and customer service;
- Extensive records in satcom ground segment integration: RF sub-systems/ baseband/ terminals/ network operation centers;
- Expertise in designing / manufacturing of high-power amplifiers (TWTA, SSPA) and earth stations up to Q/V band;
- Full master of radio frequencies up to 50GHz;
- Signal processing/transmission techniques including complex modulations;
- Services: customized trainings for operation and maintenance, antenna commissioning (up to 13m), Integrated Logistic Support.



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Effectors
& Fire
platforms



Fire Command
& Control
Systems



Replenishment
& Logistics

MOBILITY, PROTECTION AND FIREPOWER

Arquus has been designing and supplying specific mobility solutions for numerous vehicles and weapon systems. The company has notably provided with the chassis for the Caesar® self-propelled cannon from Nexter Systems, created specifically for the French Army and proven on all grounds. The same chassis has been selected for various export markets.

The Sherpa Light combat-proven and high-capacity chassis cowl is also in demand from various manufacturers in South America, Europe and Asia, providing the basis of high-performance, high payload weapon-carrying tactical vehicles.

HORNET: A NEW FAMILY OF FRENCH RCWS

A RANGE TAILORED FOR THE SCORPION PROGRAM

Within the framework of the Scorpion program, Arquus has developed a full new range of remote-controlled weapon stations, which have been equipping the Griffon vehicle since 2019 and will be equipping the EBRC in 2021. Named T1, T2 and T3 (Hornet family), these RCWS will provide firepower for all the new generation combat vehicles of the French army.

These complex systems require the mastery of highly technical skills: high precision mechanics, security electronics, optronics and image processing, dynamic controls and operating safety.

These RCWS benefit from the most modern technologies: Full HD digital image, extended connectivity with the vectronics suite, onscreen augmented reality tactical view, effectively placing the RCWS at the heart of collaborative combat.

THE HORNET RANGE : READY FOR ALL MISSIONS

Based on these firepower systems, Arquus has developed a complete commercial RCWS family: the Hornet range.

Modular and connected, Arquus remote controlled weapon stations offer unique performance on the market (Full HD video, independent ring smoke grenade launcher, collaborative combat, shared tactical situation, fire control assistance, high-class security standard). Our remote controlled weapon stations respond to a large range of mission requirements for our clients.

The Hornet, Hornet Lite and Hornet S can accommodate a wide array of weapons ranging from 12.7mm and HK40 to 7.62mm.

Combined with Arquus' Battlenet™ vectronics suite, the Hornet RCWS provides the most complete, qualified, simple and ergonomic firepower system. They are available for a wide range of platforms, from reconnaissance vehicles to logistics trucks.

ARQUUS

European leader of land protected mobility, ARQUUS is a major actor of the French Defense industry. Its expertise ranges from vehicle design, propulsion and mobility, to systems integration, automation and support. Manufacturer of world-renowned vehicles such as the VAB, the VBL, the Bastion and the Sherpa families, ARQUUS is a dedicated partner to more than 60 countries' armies all around the world.



ARQUUS
DEFENSE-MOBILITY-SYSTEMS

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ASB AEROSPATIALE BATTERIES



ASB Group is the world leader for Thermal Battery. Headquarter is located in France, Bourges, where all types of Thermal Batteries applications are manufactured, from medium calibre ammunition up to the biggest ballistic missiles. ASB Group includes international subsidiaries: MSB in UK Coatbridge, ATB in USA Westminster, as well as APS & VAR in India Hyderabad. ASB shareholders are AIRBUS 50% and TOTAL/SAFT 50%.

DESIGN AND MANUFACTURE OF THERMAL BATTERIES FOR ALL KINDS OF AMMUNITION

ASB OFFERS THE LARGEST PORTFOLIO OF THERMAL BATTERIES

The active portfolio is covering over 120 different batteries, each of them dedicated to customer optimization. From 14 g up to 35kg, ASB Thermal Batteries are equipping all types of missiles, guided rockets, guided artillery shells, guided air-to-ground bombs, torpedoes, ejection seats of aircrafts, EPS (Emergency Power Supply) for single engine aircrafts, space launchers TVAS (Trust Vector Actuator System), satellites exit, etc. ASB is a robust Group, the complete key factors are mastered in-house, as electro-chemistries, headers, etc.

ASB THERMAL BATTERIES PERFORMANCES PERMIT TO SUSTAIN EXTREMELY HARSH ENVIRONMENTS

- Automatic ignition of thermal battery at the gun firing, thanks to ASB qualified G-strikers for all the calibres applications, from 30 to 155mm.
- Guarantee of 100% of performances from -46 to +85°C.
- Capability to sustain a firing gun acceleration of over 28,000g.
- Guarantee of performances after over 15 years life duration, without any maintenance.
- The specific power can be up to 5.5kW/kg, and can sustain very heterogeneous load profile along duration, including high peaks.
- ASB exclusive technology allows very stabilized voltage despite peaks (plus & minus) of loads: the voltage curve remains very flat along activated time, due to specific electro-chemistries. E.g. an EPS may not need any electronic to sustain an acceptable stability.



ASB AEROSPATIALE BATTERIES

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Sensors:
target
acquisition
capability



Strike
Effectiveness

INNOVATIONS IN LASER

AT THE EDGE OF MODERN TECHNOLOGIES

Due to its unique expertise in laser and optonics, CILAS proposes several products in the fields of designation and high energy lasers.

CILAS' Ground Laser Target Designators and Laser Target Modules deliver an accurate semi-active laser guidance for all types of precision guided ammunitions. Laser Target Designators are designed to meet the Joint Terminal Attack Controllers requirements to ensure surgical strikes. Laser Target Modules have been developed to equip attack helicopters, UAV and mobile land platforms.

CILAS' High Energy Laser Multiple Application - Power (HELMA-P) is designed to engage UAVs threats and also fixed targets. HELMA-P is a Counter UAV solution which ensures immediat, silent and surgical shots and avoids collateral damages.

MASTERING SURGICAL STRIKE

- The DHY 307 is a Ground Laser Target Designator capable of illuminating a target up to 10 kilometers. The DHY 307 can operate with NATO and other laser guided weapons.
- The DHY 308 is an evolution of the combat proven DHY 307. Two times lighter and more compact, the DHY-308 is equipped with an athermal diode pumped laser that does not need an active cooling system.
- The DHY 208 is a 2kg Ground Laser Target Marker/Designator class. Developed to ensure easy transportation, the DHY 208 is for medium range designation use, up to 5km.
- The Aladem 80 & 150 are Lasers Target Modules which can be embedded in gimbal payloads or land sights. Aladem are athermal modules with a very low residual consumption in stand-by mode. They can operate long range designation, 10 kilometers and beyond. Aladem 150 encompasses an eye safe laser range finder.
- HELMA-P is a fiber laser weapon system capable of detecting, locating, tracking and neutralizing soft aerial targets. Combined with a C2, it ensures the protection of a sensible area against mini drones. It can also be integrated on mobile platform for the security of military convoys.

CILAS

A subsidiary of ArianeGroup and Areva, CILAS, has been at the leading edge of the modern technology sector for more than 50 years, thanks to its unique expertise in laser and optonics technologies. CILAS develops, manufactures and markets products and systems using these technologies for defense or security. The company is also involved in large-scale scientific laser programs.



DCI



Fire Command
& Control
Systems

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 France-friendly countries. It offers customised solutions to reinforce fire support capabilities. DCI has more than 100 customer countries and 7 permanent offices abroad.



THE REFERENCE OPERATOR FOR THE FRENCH MINISTRY FOR ARMED FORCES

CUSTOMISED COURSES TO MEET YOUR NEEDS

DCI offers individual and collective operational training for your artillery teams in France or in your country, in French or in your own language, and customised services of on-site operational assistance to optimise your knowledge and skills in the use of new systems.

In 2010, DCI created the International Training Center in Draguignan (CIF-D) to welcome foreign officers and NCOs within the French Artillery and Infantry Schools.

Training in operational maintenance, armament, electronics and mobility is also available within the Military Schools in Bourges.

DCI offers support in designing, implementing instrumentation-simulation systems, and managing your artillery training centers.

Course durations vary from a few weeks to one year.

THE CIF-D OFFERS BASIC AND ADVANCED COURSES:

- **Field Artillery Senior Officer Course** trains Field Artillery battalion commanders or senior officers integrated in a Tactical Operations Center at battalion & brigade levels within the framework of joint and combined operations.
- **Artillery Battery Commander Course** prepares future battery commanders for their missions of commanding an artillery unit, or advising a combat arms battalion commander on fire support and managing forward observer teams.
- **Artillery Platoon Leader Course** prepares junior officers for their first posts as platoon leaders and forward observer team leaders through the acquisition of the necessary knowledge of Field Artillery, weapon systems and target engagement in a combined environment.
- **Artillery Gun Crew Leader Course** prepares future gun crew leaders for their missions through the acquisition of the necessary knowledge of Field Artillery.
- **Joint Fires Universal Observer** qualifies officers to perform tasks in order to optimise the effects of joint fires capabilities: how to request, control and adjust surface-to-surface fires, provide close air support and terminal guidance operations targeting information.



DCI

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Effectors
& Fire
platforms

ECA GROUP

COMPREHENSIVE UNMANNED SOLUTIONS FOR DEFENCE & SECURITY: UGVs & UAVs

AN ENHANCED SITUATIONAL AWARENESS AND SAFER PROGRESS

Along with the French Army, ECA GROUP has been actively engaged in the development of unmanned systems preventing human exposure to danger. Thanks to its wide range of mini and medium size UGVs, the security forces have the ability to access narrow, hostile or constrained places and ensure a safe progress by providing a risk mapping and manipulation capabilities. Mobile and resistant, ECA GROUP UGVs can be equipped with different payloads like manipulator arm, X-RAY systems, disruptors, laser, etc. The capacity of these UGVs in terms of detection, analysis and manipulation meets all needs and expectations of military forces as well as the civil security forces.

Air support is also essential for security operations. A safe progress requires to be aware of what is behind the hill, day and night. ECA GROUP UAV IT180 is in use within the French Army and other world's armies to enhance situational awareness of security forces. As a result, UAVs dispel any doubt within a perimeter. The low radar cross section and noise signature offers an ideal support for covert operations.

QUICK RESPONSE FOR ALL KIND OF MISSIONS

In safe and rescue operations, ECA GROUP systems can provide the first response, in particular with UAVs. Much like border surveillance, UAVs are an ideal support in remote areas which are risky to rescuers. UAVs can fly closer to the ground and at slower speeds than some manned aircrafts, potentially offering greater image resolution and increased detection success.

For Hazmat operations and missions in confined spaces, ECA GROUP offers rapid response systems for identification of CBRN materials. This can be achieved through the employment of UGVs and UAVs. These CBRN detection systems allow stand-off control and safety for the operator in high threat environments. ECA GROUP supplies neutralisation capacities, with the mini UGV COBRA, lightweight Counter CBRN UGVs CAMELEON E / LG E and medium UGV IGUANA.

ECA GROUP operates at the cutting edge of technology and provides innovative and resilient solutions to meet the demands of Homeland Security missions. Supporting customers world-wide, whether government agencies or private sector organisations is a fundamental part of ECA GROUP's commitment.

ECA GROUP is renowned for its expertise in robotics, automated systems, simulation and industrial processes. Since 1936 it has been developing complete innovative technological solutions to perform complex missions in hostile or restrictive environments. ECA GROUP provides a complete range of robotic systems that act as a «Force Multiplier» for many Defence and security operators worldwide.



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EURENCO



Strike
Effectiveness

Created in January 2004 from the merger between SNPE Explosives & Propellants, NEXPLO Bofors, EURENCO inherited its parents' centuries of in-depth knowledge of energetic materials. Widely acknowledged for its high level of expertise and know-how in chemical synthesis and transformation of energetic molecules, EURENCO develops, manufactures and provides a largely diversified range of cutting-edge energetic materials for both the defense and the civil markets.

WITH REGARDS TO ARTILLERY APPLICATIONS, EURENCO OFFERS A UNIQUE RANGE OF PRODUCTS AND SERVICES, FROM R&D TO SERIAL PRODUCTION:

- High explosives (Conventional & Insensitive) for melt-cast, pressed and cast PBX explosive charges;
- Cast PBX charges for Insensitive shell ammunition;
- Base Bleed grains for extended range artillery ammunition;
- Single and multi-base propellants for small to large caliber military ammunition, mortar increments, recoilless antitank weapons;
- Low vulnerability (LOVA) propellants for Insensitive propelling charges;
- 100% EURENCO Modular Artillery Charge System (MACS) for artillery ammunition;
- Combustible Cartridge Cases (CCC's) for tank and artillery ammunition;
- Nitrofilm for mortar horseshoe containers.

To ensure both flexibility and large-scale capabilities, EURENCO is equipped with modern and innovative facilities, including multipurpose synthesis units as well as automated workshops for the loading of Insensitive Munitions and manufacturing of Modular Artillery Charge Systems.

A leading European company for military explosives, propellants and combustible items, EURENCO also provides explosives for the civil sector (oil & gas perforation, mining), and owns the world's largest production capacity for 2-EHN (diesel fuel additive).

EURENCO operates 4 modern production plants in France (Bergerac, Sorgues), Belgium (Clermont) and Sweden (Karlskoga).

A favored partner of major companies worldwide, EURENCO is increasingly involved in new international programs.



EURENCO

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Sensors:
target
acquisition
capability

LEADER IN END-TO-END MECHATRONICS, OPTRONICS AND IMAGE PROCESSING

MULTI-SENSOR CAMERAS AND TARGETING SYSTEMS

EXAVISION has developed bespoke optronic solutions integrated into global product lines:

- Multi sensor cameras covering the whole spectrum range (FHD day and night, thermal band I, II and III, LRF, DMC...);
- Stabilized and accurate rugged Pan & Tilt platforms.

EXAVISION range of equipment combines superior performance, high reliability and competitive price, to satisfy system integrators on:

- New development programs, from adaptation and qualification of existing solutions, to serial production;
- Refit programs, with Fit Form Function solutions, improving performance, availability and technical sustainability of the systems.

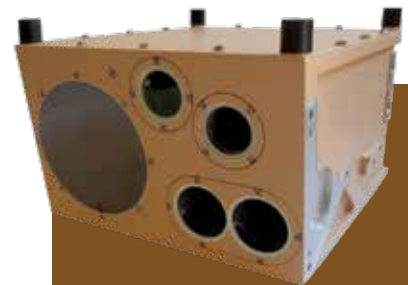
SOLUTIONS FOR LAND VEHICLES AND WEAPONS STATIONS

Observation and Targeting Electro-Optical Systems: designed using various types of sensors, integrated into weapon systems or on naval vessels and land vehicles. These systems are qualified under extreme conditions such as shocks and explosions, vibrations, salt spray, temperatures and electromagnetic environment. Their robust and lightweight casings machined from solid blocks of aluminium are compatible with terrestrial, maritime and military operating environments and standards.

- Smart combination of daylight sensors and uncooled thermal cameras, associated to Laser Range Finder, and integrated into a waterproof and fully qualified mechanical assembly.
- Dual Field of View uncooled thermal cameras, THOR and THOR-LRD solutions, allowing NATO target (2.3m x 2.3m) identification up to 1.5km and 2km.

EXAVISION

EXAVISION, an independent French SME since 1990, designs, produces and qualifies complex, smart and stand-alone optronic solutions dedicated to battlefield surveillance, remote weapon stations for target recognition and identification applications.



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JOHN COCKERILL DEFENSE



Sensors:
target
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Effectors
& Fire
platforms



Fire Command
& Control
Systems



Strike
Effectiveness



Replenishment
& Logistics

John Cockerill Defense designs, produces, maintains in operational condition and upgrades turrets and weapon systems from 25 to 120mm calibre. John Cockerill Defense has a training and education centre to train our customers and our partners in the maintenance and usage of our systems, including operational firing situations.

DESIGN, PRODUCTION, MAINTENANCE IN OPERATIONAL CONDITION, TRAINING

FROM DESIGN TO PRODUCTION

Thanks to the know-how of its engineering and production units, John Cockerill Defense develops, designs and produces its weapon systems. John Cockerill Defense relies on quality and innovation with the same objective: to develop the capacity of Cockerill® weapon systems, new or in service, in accordance with the evolution of the operational needs of the users. To achieve this, John Cockerill Defense relies on its cutting-edge skills such as engineering in architecture, ballistics and mechatronics, all supported by a permanent technology watch. This expertise is used for the production of gun turrets:

- Modular;
- Robust and protective of on-board crew;
- Lightweight, mobile and air transportable;
- With high firepower;
- Upgradable.

FROM TRAINING TO USE

John Cockerill Defense has a training and education centre for our customers and partners. The structure delivers tailor-made training for the full range of military requirements at operational and tactical levels. It is particularly suitable for training the crews on land-based military weapon systems and equipment:

- Either on receipt of new equipment;
- Or the technical and technical-operational use of the equipment in stock;
- And for the maintenance and improvement of know-how throughout the life cycle.

John Cockerill Defense supports the conduct of training, by our own team to provide logistical support, security of operations and firing management. The centre is equipped with the latest training technology equipment such as Agueris® simulators and virtual maintenance trainers.

The centre can accommodate up to 120 trainees for short or long stays, with full support in exceptional comfort and teaching conditions.

- Secure site.
- Catering.
- High-end accommodation.
- Sports facilities.

It can be adapted to configurations other than defence, the security field for example.



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Sensors:
target
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Strike
Effectiveness

JUNGHANS T2M

EUROPEAN LEADER FOR MUNITION FUZES AND MISSILE SAFETY & ARMING DEVICES

TRUSTED PARTNER FOR SMART AND RELIABLE FUZE SOLUTIONS

The company has the background and know-how in designing, engineering and producing fuzes and safety & arming devices (SAD). JUNGHANS handles projects and products from concept design, development, industrialization up to mass-production, as well as transfer of technology proposals. JUNGHANS is able to provide its customers - armed forces or industrial partners - with reliable and safe state-of-the-art solutions.

The improvement of modern munition performances and capabilities is directly linked to the fuze functionalities. To meet modern warfare requirements in fire support operations JUNGHANS provide a wide range of fuzes for indirect fire munitions - artillery and mortar - whatever the technology (mechanical or electronic fuzes) and the operational requirements (proximity, time, impact or multi-function fuzes).

NEW GENERATION FUZES TO MEET MODERN WARFARE OPERATIONAL REQUIREMENTS

The modern fuzes, proposed by JUNGHANS, provide significant benefits in terms of:

- Safety features: in particular with new generation dual-safe fuzes for mortar, compliant with STANAG 4187 and IM (Insensitive Munitions) features;
- Operational flexibility: multifunction fuzes with several operational modes and various functioning parameters, hand settable or inductively settable, able to achieve different types of missions (e.g FRAPPE and L166 Multifunction fuzes);
- Terminal effect: optimization of the effectiveness on target is achieved with a state-of-the-art radar sensor, that provides better height of burst measurement, as well as jamming resistance. The terminal effect improvement is also achieved for impact and post-impact functions with the capability to survive high impact shock and to detonate at the preset time after target impact.

Beyond this new generation of fuzes, JUNGHANS also proposes new fuzing systems for integration in guided munitions, either S&A functions based on electromechanical or electronic solution (including EFI / LEEFI technology), as well as proximity sensor modules, adaptable to specific munition or missile configurations.

JUNGHANS T2M has been providing for decades numerous ammunition fuzes for artillery, mortar, air defence and naval artillery, aerial bombs, rockets, tank ammunition, anti-tank weapons, medium calibre ammunition as well as safety & arming devices for missiles.



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 **JUNGHANS**
Defence

JUNGHANS T2M

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MBDA



Sensors:
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Effectors
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platforms



Fire Command
& Control
Systems



Strike
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Replenishment
& Logistics

As the European leader in missile and missile systems, MBDA Air Defence systems portfolio offers a broad range of weapon systems capable to protect vital assets and deployed troops against a wide panel of threats from ballistic missiles to micro-drones.

FROM BALLISTIC MISSILES TO MICRO-DRONES: A COMPLETE AIR DEFENCE PORTFOLIO

LICORNE is a lightweight, highly mobile system coordinating sensors such as ESM, optronics or radars and VSHORAD and small UAV effectors (Mistral, jammers or drone-killers...), while being integrated with other C² and in an air defence network. Its compact design makes it very well suited for lightning raids (airborne/mountain) or amphibious operations.

MCP-NG (New Generation Mistral Coordination Post) and **I-MCP GM 60** (Improved Mistral Coordination Post) C² systems for Mistral provide all the necessary functions for deployment and engagement of Mistral ground systems. Natively equipped with radar sensors, they can be fitted with other complementary sensors and tactical data links.

PCP (Platoon Command Post) is a modular C² system, offering MISTRAL and VL MICA multi-layered coordination. To provide surveillance, detection and identification, PCP is designed to be linked to a variety of sensors to other C² and to an air defence network.

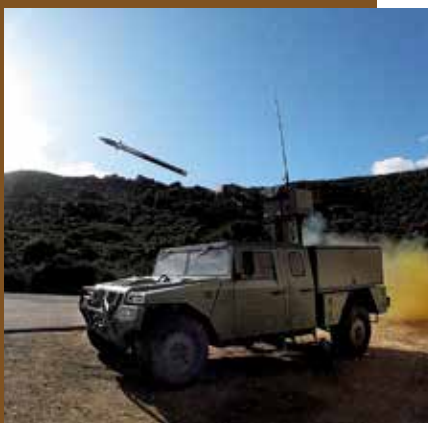
MISTRAL, a fire & forget missile, ensures a very high kill probability against all types of air targets including high speed aircrafts, helicopters and UAVs. MISTRAL is launched from a variety of ground platforms (MANPADS, ATLAS, ATLAS-RC, ALBI, MPCV) and from helicopters.

MPCV (Multi Purpose Combat Vehicle), is a high firepower weapon system for ground based air defence operations. It offers high mobility and crew protection with a small calibre gun (12.7mm) and 4 MISTRAL ready to fire. The weapon system can be fitted on a wide range of armoured vehicles, and is remotely controlled from MBDA C² systems.

ATLAS RC, the latest generation of Mistral weapon system offers high mobility and crew protection with two MISTRAL missiles ready to fire. The weapon system can be fitted on a wide range of armoured vehicles, and is remotely controlled from MBDA C² systems.

VL MICA system, is equipped with vertically launched MICA IR and EM missiles, provides an optimal defence area against a wide range of threats from any direction (360°), with the ability to simultaneously engage multiple targets. The design of the VL MICA system guarantees ease of deployment with a reduced workforce and logistical footprint, an optimized life cycle cost and easy integration into an air defense network.

Aster 30 SAMP/T, is the main 21st century extended air defense mobile weapon system for protecting theaters. It protects sensitive sites and deployed forces against threats linked to aircraft and missiles (TBM, stand-off, cruise missiles, ARM).



MBDA
MISSILE SYSTEMS

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Sensors:
target
acquisition
capability

METRAVIB DEFENCE

For over 25 years, METRAVIB DEFENCE, subsidiary of ACOEM Group, designs and produces high-performance threat surveillance, detection and localization solutions for the defence and civil protection sectors.

ACOUSTIC GUNSHOT DETECTORS

OUR KNOW-HOW

Based on the lessons learned from their deployment on various theaters, such as Afghanistan, Iraq, Central Africa, by more than 25 armies, we sustainably develop highly innovative solutions with added value and to provide the best, simple & reliable products that operate quickly and can be used with confidence by the users.

Our full range of products can be fully interoperable with fires that directly support land, maritime, amphibious and special operations forces to engage enemy forces, combat formations, and facilities in pursuit of tactical and operational objectives.

OUR PRODUCTS

PILAR Ground Version, a scalable multiple array configuration is suitable to various kind of sites such as check-point & command post, border control post, military bases, etc. When networked with the Battlefield Management System (BMS) it is at the center of the infovalorization and digitalization of the battlefield. The system reports real-time the GPS coordinates of the threat on the local cartography and share essential data outputs with fire support such as counter-battery radar, etc.

PILAR Vehicle Version is the essential sensor of the vetronics for an Enhanced Situational Awareness and for a Greater Force Protection; coupled with a Remote Control Weapon Station (RCWS) it offers unique slew-to-cue capabilities for neutralizing the threats.

PEARL is designed for the protection of soldiers. PEARL is a small-size and light-weight mission kit to be mounted on any type of rifle such as assault rifle, a sniper rifle, a machine gun, multifunction goggles/sights or Unmanned Ground Vehicle (UGV) in order to increase the soldier's security and efficiency during its mission.



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 **Metravib
Defence**

ACOEM Group

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NEXTER



Sensors:
target
acquisition
capability



Effectors
& Fire
platforms



Fire Command
& Control
Systems



Strike
Effectiveness



Replenishment
& Logistics

Nexter is reputed for its wide range of modern and combat proven artillery systems. As the heir of the French artillery known-how since 1764, it has acquired a large knowhow in ballistics, vehicles and systems, and has become the leader in artillery systems.

A COMPLETE RANGE FROM THE ARTILLERY GUNS UP TO BATTALION SYSTEMS, INCLUDING AMMUNITION, SUPPORT AND FIRE CONTROL SOLUTIONS.

The gun solutions developed by the company are references:

- CAESAR® 6x6, the self-propelled 155mm/52 Cal. Deployed in operation since 2009 in Afghanistan, Lebanon, Mali and Iraq with the French Army;
- CAESAR® 8x8, the same successful ordnance with additional payload. The future of a revolutionary concept;
- 105 LG1, the 105mm lightest towed gun, now in service in five countries. The combat proven weapon of choice for rapid reaction forces.

Nexter maintains a close relationship with Army End-Users, and particularly with the French Army to improve its knowledge and comprehension of operational needs. It led to the development of a full range of products, from ammunition to artillery C2 systems (FINDART) and comprehensive operational/logistic environment of an artillery battalion.

In addition, Nexter offers all the components of a battalion such as command and control vehicles (TITUS®), a wide range of logistics vehicles, transmission, observation and detection systems and services (training, maintenance).

In its focused End User approach, Nexter evaluates each specific operational need for fire coordination and control, and offers the most appropriate solutions.



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A COMPANY OF D+S

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Strike
Effectiveness

THE WORLDWIDE LEADER IN MANUFACTURING ROCKET MOTORS FOR TACTICAL WEAPON SYSTEMS

Roxel is the worldwide leader in the design and manufacture of solid rocket propulsion systems for a range of tactical weapons. With dedicated research, engineering and delivery teams, Roxel offers innovation and capabilities throughout the product life cycle from design, simulation, development and qualification, testing, series production and in service support and disposal.

The teams also offer research and technology capabilities, providing innovative solutions for new propulsion systems from the initial concept stage. Roxel also have capabilities in the design and manufacture of metallic structures and composite materials for a wide range of applications including aerospace.

ITS MULTIPLE SKILLS

Roxel has proven capabilities in the chemistry of energetic materials, interior ballistics and mechanical fields, offering its customers bespoke solutions for all elements of propulsion systems (structures, thermal protection, energetic and inert materials).

Roxel can meet the most complex requirements in terms of performance, quality and safety. Roxel is the world leader in insensitive munitions (IM) technology for minimum smoke rocket motors.

Roxel's rocket motors are used in all types of missiles and rockets: air-to-air, ground-to-air, artillery, anti-ship, anti-tank, air-to ground, cruise missiles and guided bombs. For instance, Roxel is responsible for propulsion systems used in the following missiles: EXOCET Family, ASTER Family, MAGIC, MICA, MILAN, ASRAAM, RBS15, CAMM, MMP, etc. Moreover, Roxel designs and supplies pyromechanisms, gas generators and a standardised family of motors for the decoy system, target and drone market.

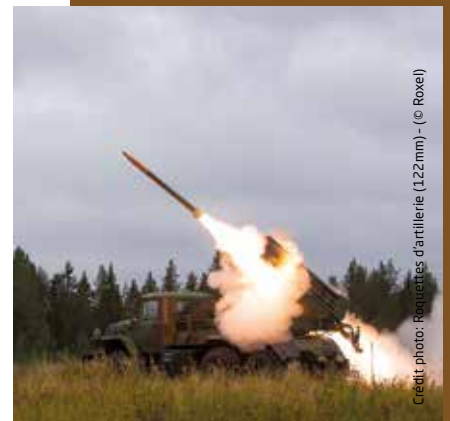
Roxel is present worldwide in the majority of current and future missile programmes and has a large «portfolio» covering all segments of the world missile and rocket market.

ROXEL

Roxel is the worldwide leader in tactical propulsion systems and a major player in the market. Roxel conducts world-class projects based on its know-how and knowledge. Based in France and the United Kingdom, Roxel designs, develops, manufactures and sells solid propulsion systems and related equipment for all types of rockets and tactical and cruise missiles for air, sea and ground forces.



Crédit photo: Missile Aster 15 - (© MBDA)



Crédit photo: Roquettes d'artillerie (122mm) - (© Roxel)



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SAFRAN ELECTRONICS & DEFENSE



Sensors:
target
acquisition
capability



Effectors
& Fire
platforms



Fire Command
& Control
Systems

Safran Electronics & Defense holds world or European leadership positions in optronics, avionics, electronics and critical software. Safran Electronics & Defense is the No. 1 company in Europe and No. 3 worldwide for inertial navigation systems used in air, land and naval applications. It is also the world leader in helicopter flight controls and the European leader in optronics and tactical UAV systems.

A WORLD-RENOWNED SPECIALIST IN INERTIAL NAVIGATION AND OPTONICS

KNOWN-POSITION IN ALL CONDITIONS

Safran provides navigation solutions based on the resonating gyro technologies. All the Griffon of the Scorpion program embark these solutions with Epsilon, as the reference GPS back-up solution. PASEO™ Crystal is an artillery forward observation, acquisition and designation sight for both guided and unguided weapons. Thanks to ONYX™ INS, it delivers resilient navigation positioning in GNSS-denied environment. Safran also developed inertial measurement units for missiles, such as the Mistral and MMP.

TARGET DESIGNATION FROM THE GROUND

Combining optronics and navigation skills, Safran provides target designation systems for land vehicles. The PASEO system embeds an HRG navigation unit for the Artillery Observation variant of the French Scorpion program vehicles. Its expertise in resonating gyros allows Safran to offer lightweight systems with exceptional performance, via the combination of the JIM™ Compact binoculars and the Sterna target acquisition system. For forward observation and JTAC, JIM™ Compact can be connected to laser designators. JIM™ Compact is in service in more than 12 NATO forces.

PATROLLER: INTELLIGENCE & TARGET ACQUISITION

The Patroller is a multi-sensor & multi-mission long-endurance tactical UAV system. It features a modular design, enabling it to carry a payload up to 250kg with an endurance exceeding 20 hours at a ceiling of 20,000 ft. Patroller operates simultaneously different sensors: optronic (EO/IR) pod, SAR/MTI radar, electronic warfare system, distress beacon detector and automatic identification system. The French Army selected Patroller in 2016.

HIGH-RATE, HIGH-PRECISION FIRING

As the world reference navigation and pointing unit for Artillery, Safran's Sigma 30 system equips many systems worldwide such as PzH2000, Caesar and Archer guns. Geonyx™ is the latest family of INS manufactured by Safran designed to meet all land vehicles navigation requirements. Geonyx enables quick battery deployment against improvised targets and independent firing by artillery pieces. It can also be fitted with a MINEO sight for direct line-of-sight firing.



SAFRAN ELECTRONICS&DEFENSE

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Sensors:
target
acquisition
capability



Effectors
& Fire
platforms

SCROME SAS

A NATO supplier contracted for dozens of products, SCROME's rare multi-disciplinary expertise is well renowned among artillery, infantry, armoured, naval and airborne systems specialists.

YOUR FRENCH-DESIGNED, FRENCH-MADE HIGH PRECISION OPTICAL SYSTEMS

OVER 30 YEARS OF EXPERIENCE

SCROME SAS is a leading French company dedicated to engineering, manufacturing and maintaining various optronic and opto-mechanical instruments for observation, sighting, alignment and metrics for private and military applications.

From riflescope, thermal sights, clip-on systems, to embedded cameras, periscopes for Navy vessels and planetarium objectives, our products are user-focused and performance-driven.

ARTILLERY LAYING AND MAINTENANCE TOOLS

Our artillery dedicated range has been in service for over 20 years in the French army and several others, and is as pertinent on brand new equipment as on retrofits:

- GP2M and GP1M - light, compact and sturdy goniometers for infantry and artillery mortars, howitzers and main guns (issued on 81mm and 120mm mortars, 105 light guns and 155mm CAESAR systems, and many more worldwide);
- Tritium-free lighting and less than 2 mil. total reading error;
- Direct-fire scope, for howitzers and main guns (issued with 155mm CAESAR gun, among others).

Maintenance and setting tools make half the value of artillery systems... We also provide these:

- 81 and 120mm mortars angular boresighter (other calibers upon request);
- Optical and video boresighters, from small arms to RWS and artillery;
- Bore rods, from 7,62mm to 155mm;
- Artillery precision levels and quadrants.

We also offer a wide range of military grade optrics:

- Day, night, thermal, fire control and observation cameras;
- Sniper scopes;
- Thermal scopes for large calibre rifles, clip-on systems;
- Compact optical and thermal monocular and LRF;
- And many more...

Please contact us for any specific needs.



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THALES



Sensors:
target
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Effectors
& Fire
platforms



Fire Command
& Control
Systems



Strike
Effectiveness



Replenishment
& Logistics

Thales's Joint Fire Support solution is based on the French ATLAS programme. It's a dedicated fire support management system that lets digitized artillery units perform every aspect of their missions. From gun level up to brigade level, the combat-proven Joint Fire Support system is a modular, scalable and fully integrated solution. It includes DACAS functions and is interoperable with ASCA.

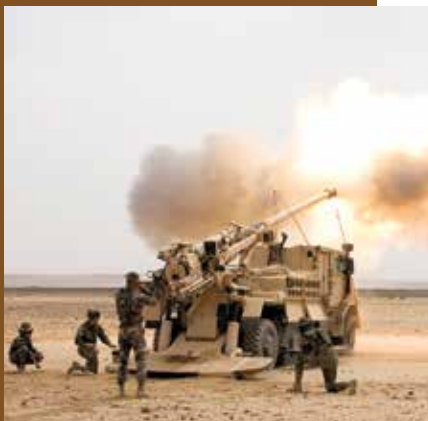
THALES'S JOINT FIRE SUPPORT SOLUTION: FROM GUN LEVEL UP TO BRIGADE LEVEL

IT MAY INTEGRATE ALL OR PART OF THE SUB-SYSTEMS

- A comprehensive and scalable Fire Control System (FCS) to sustain high efficiency artillery operations. It supports key facilities such as firing unit's optimal selection or enhanced ballistic computation.
- A battlefield digitization capabilities to master the full fire chain of command - from Gun level up to Brigade level - thanks to a proven Battle Management System (BMS) and advanced near real-time data communication means (VHF) relying on Thales or customer legacy tactical radios.
- A complete target Acquisition solution for the Forward Observer (FO), Joint Terminal Attack Controller (JTAC) including requested sensors (dismounted or vehicle integrated) such as electro-optical / infra-red (EO IR) assets, ground target radar, counter battery radar or mid-range Unmanned Aerial Vehicle (UAV).

THE KEY OPERATIONAL BENEFITS ARE:

- Speed up tempo of operations from the target acquisition till the target engagement;
- Automate mission planning thanks to a highly automated C2 Artillery system and high-end data transmission capabilities;
- Improve fire accuracy & Safety at all level of the fire chain: Reduce collateral damage, less exposure time, less fly hours for the same result and better mission turn rate;
- Optimize firing plans;
- Cover end-to-end artillery needs through a prime System Integrator;
- Ensure survivability as a permanent objective thanks to the ability to integrate advanced solutions such as counter fire for an early enemy riposte detection, or inertial navigation unit for a rapid firing unit's redeployment;
- Continuous improvement and long-term life cycle through ATLAS programme.



THALES

THALES

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The French land defence and security
industry association

GICAT, a professional group, created in 1978, has over 270 subscribers, corporations, midmarket companies, SMEs and startups. These members cover a wide range of industrial, research, service and consulting activities for military and civil organizations, of national or international scope, involved in land and/or airland security and/or defence.

The international ambitions of GICAT are reflected in its international exhibitions, EUROSATORY in France, Expodefensa in Colombia, ShieldAfrica in Ivory Coast, and Platinum Security Exhibition in Monaco, organised by its subsidiary, COGES, and a certain number of other defence and/or security exhibitions overseas.



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