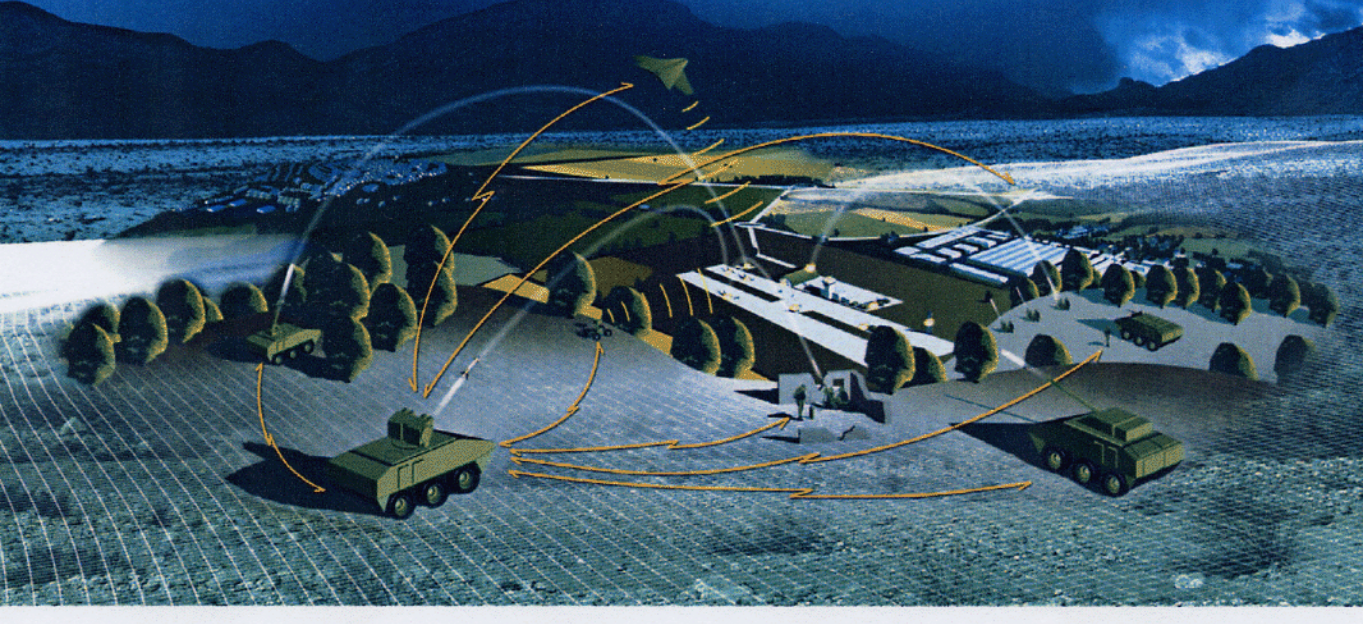


Land Forces Adopt Digital

New programs offer combat units greater interoperability, situational awareness.



Europe's armies and defense firms are working together to transform conventional ground forces into digitized, network-centric units. A major part of this effort seeks to connect legacy equipment to data and communications networks. The first of these advanced national brigades is scheduled to enter service by the end of the decade.

The transformation of traditional military forces into agile computerized formations is affecting military services around the world as new technologies become more affordable. This trend is especially evident in the European Union (EU) where years of research and development are beginning to bear fruit in the form of advanced command and control systems and mobile battle-

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field information networks. But the EU's armies must be able to integrate new technologies into their inventories of legacy equipment while remaining in compliance with NATO communications and data protocols.

European defense companies are heavily involved in the ongoing transformation. One firm at the forefront of this process is the Thales Group. The company reorganized itself in March to serve the continent's ground forces better, explains Bruno Rambaud, senior vice president and managing director of Thales' new Land and Joint Systems Division, Colombes, France. He adds that, while command, control, communications, computers, intelligence, surveillance and reconnaissance (C⁴ISR) systems traditionally have been integrated into naval

The French army's Bulle Operationnelle Aeroterrestre (BOA) demonstration program will model and test network-centric capabilities for ground units. The effort will test and model enhanced networked communications and situational awareness technologies in a variety of virtual and live simulations. The goal of BOA, in which Thales will play a key part, is to identify the technologies and doctrines necessary to field an advanced, digitized brigade by the end of the decade.

and airborne platforms, this has not been the case for ground units.

Instead of organizing the new business unit by products, the company's services are offered through a systems-based approach. A decision was made not to split the company's C⁴ISR assets

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The BOA program is part of a series of initiatives being undertaken by the French and other European armies to develop and test advanced battlefield command, control, communications, computers, intelligence, surveillance and reconnaissance tools.

for its land systems, allowing it to maintain its expertise under one roof. Rambaud observes that, while other markets such as avionics are shrinking or remaining steady, there is a continuing demand for ground equipment that can be used in joint operations.

The availability of network-centric technologies has prompted nations such as the United States, the United Kingdom, France and Germany to develop rapidly deployable digitized combat brigades. In addition, a multipartner NATO program is underway to field a network-centric unit by 2008. Rambaud explains that Thales is helping to develop technologies to link and standardize different NATO protocols.

Thales also has a key role in 14 French army programs ranging from electronic warfare to artillery command and control systems. Rambaud notes that these projects already are well into the development process and cover all echelons down to the platoon level.

Another French army program that Thales is heavily involved in is the Maitrise d'Oeuvre d'Ensemble des SIC Terre (MOE SIC Terre), a communications and data system for ground units. As the prime contractor, Thales is providing a platform that can be plugged into a global C⁴ISR backbone. Ram-

baud estimates that the program ultimately may cost more than 100 million euros (\$124 million). The first layer of this C⁴ISR architecture is a relatively small 10 million euro (\$12.4 million) contract to integrate legacy systems in 2006 and 2007. He notes that this initial effort will permit existing equipment to remain compatible with future systems.

The second part of MOE SIC Terre will apply Internet protocol (IP) technology to help integrate nonhomogeneous systems such as legacy communications equipment. This will allow the French army to integrate its communications and command and control equipment into an IP framework without the need for expensive replacement or redevelopment programs, he says.

Another major initiative launched by the French army is the Bulle Operationnelle Aeroterrestre (BOA) program. Its goal is to develop and demonstrate network-centric technologies for future digitized army units. These advances include a non-line-of-sight fire capability, reduced sensor-to-shooter times, automated target allocation and improved C⁴I tools such as tactical decision aids and collaborative engagement software. BOA-equipped units will navigate with three-dimensional geographical displays, possess a real-

time awareness of their logistics status and needs, and gather intelligence with unmanned aerial and ground vehicles. Troop and vehicle survivability could be enhanced through an initiative to reduce the risk of friendly fire and a nonlethal, soft kill capability.

The program not only will develop new technologies, but also it is designed to affect French army combat training and doctrine. An important aspect of BOA is the use of modeling to adapt different systems and to determine how well they interact. After an initial simulation, a specification for a future technology or system can be created and fully tested in a virtual laboratory, Rambaud says. Thales, GIAT Industries and Sagem are the primary team members in this 135 million euro (\$168 million) effort.

This application of simulation technology is a break with traditional contracting methods where customers prepared specifications and presented them to vendors in a lengthy development and delivery process, Rambaud maintains. Simulation technology is moving European governments and contractors into a new phase where specifications are tested, defined and developed by both partners. But transformation at the program level requires a change of mindset for both customers and industry, he says.

Rambaud notes that this different approach is being applied through battlespace transformation centers, or battlelabs, where Thales is helping nations such as Norway and South Korea model future joint-service technologies. He adds that these laboratories also serve to test a mix of new and legacy systems in various simulations and scenarios.

Thales is using its battlelab to address technical issues relating to NATO's transformation. The company gathered an international team of engineers and experts to design software and communications architectures. The center can be used to test operational concepts and doctrine through simulated exercises and scenarios. "You have to change the doctrine drastically in the command chain. This is where we see a major opportunity to work with our customers in a new way," Rambaud says.

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The company recently used its simulation capability to develop and model an interoperability scenario for the Norwegian, German, Spanish and French armies. The Thales Interoperability Initiative (TII) simulated a fox-hole-to-headquarters integration of command and control capabilities for a multinational division operating under NATO standards.

Participants had two displays: an operational screen for military advisers that showed command and control integration and a screen that displayed the system's technical aspects. The network operated on a German backbone braided to terrestrial wireless and satellite communications systems. "It was the first time that we were able to show high-ranking officials what a C⁴ISR operation could be like for an international division," Rambaud explains.

Thales funded the TII to demonstrate the feasibility of the technology. Rambaud notes that every platoon in the simulation had a digital radio with a digital camera integrated into it to provide video feeds. By using Web-based technology it was possible to log units in as IP addresses and allow them to determine their location on the tactical intranet. Units also could process imaging data from reconnaissance teams and aircraft in mobile databases and conduct multisensor imaging. The TII used a real scenario to model new efficiencies in how small units gathered intelligence and fed it up the command chain, greatly decreasing the time needed to order artillery fire missions.

Rambaud explains that another lesson from the TII exercise was that Thales has an advantage in the European market because of the in-house systems acquired from its consolidation. But the company must continue to explore new



New communications and networking technologies are beginning to transform European armies into more agile, network-centric forces. However, connecting these new systems to existing legacy equipment remains a challenge.

markets to find growth opportunities. "Today you need an international base because there will be no single European army working independently. There will be the Euro Corps with Spain, France, Germany and Belgium, and you will have other [multinational] corps in central Europe," he says.

The company's battlelab falls under the broader goals of national force transformation. Because it mixes a variety of systems in a single simulated environment, it provides developers and commanders with a global view of how a proposed system may operate. "You can make something like a tactical integration platform, just to check that whatever you put in will work," Rambaud observes.

He adds that the facility can be used for a variety of purposes, either as a think tank to test new concepts, as a simulator to model the interaction of new and old equipment or as a training center to develop doctrine. For example,

a backbone system can be tested to determine whether it has the required capacity, and then it can be simulated in an operational environment. Once these tests are complete, the data can be used to train personnel in the equipment's use because its operational doctrine has been checked and defined. "What's new today is that we can develop anything. Any simulators will be connected directly into the command chain. Then you can play with whatever type of battlelab you want," Rambaud offers.

WEB RESOURCES

Thales: www.thalesgroup.com
Delegation Generale pour L'Armement: www.defense.gouv.fr/dga
NATO: www.nato.int
GIAT Industries: www.giat-industries.fr/us_index.asp

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Powering the transformation of land warfare

The challenge in land warfare today is to design fully integrated systems covering the whole "sensor to shooter" chain. To meet this challenge, Thales is the sole European industry player that integrates all its activities related to major system prime contracting to provide decision makers with network-enabled solutions for land and joint operations.

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Bolstered by its extensive experience in key strategic areas, Thales supplies systems and services for surveillance and reconnaissance, command and control, combat, vehicles, soldiers, robotics, as well as information and communications, optronics, intelligence and data processing. By leveraging all these assets, Thales is making co-operative systems a reality.