

# Brazilian Army case study

COMBATER powered by SWORD

*COMBATER, powered by Masa Sword, is delivering a bespoke simulation and training tool just 6 months after being selected by the Brazilian Army*

Since 2000 the Brazilian Army has been well-aware of the potential benefits that a dedicated simulation center, for the provision of training, planning and evaluation, could offer: the military decision-makers have always asserted that simulated training scenarios would not only reduce the costs but also improve the quality of training.

The first constructive simulation system adopted by the Brazilian Army was developed in-house and released in 2004; by 2010 the Brazilian Army realized that the maintenance costs required to keep their system up-to-date at all times were sky-rocketing: not only the system had to be updated in order to deal with the new operational challenges and training requirements, but also to work with the new hardware, operating systems and other simulation software that were regularly acquired by the Army.

Instead of boosting in-house developments, which meant investing money in a bigger team and then trying to mitigate the consequences of the personnel turnover rate – acceptable for an army, but too high for software engineering – the Brazilian Army decided on a change of approach and replaced their constructive simulation system with an off-the-shelf product. This change was also inspired by a new wave of next-generation simulation tools that have appeared in the last few years, which due to their flexibility have led to a crisis for custom designed systems.

In order to successfully replace the current simulation system and be cost effective, the COTS solution targeted by the Brazilian Army had to be:

1. Ready to meet the latest training challenges such as asymmetric warfare, public safety and peace-keeping operations
2. Easy to customize for the Brazilian Army needs
3. Easy to upgrade, while retaining all customization
4. Smart: use artificial intelligence to reduce the number of operators
5. Open and easy to integrate with C2 systems and other simulation tools

By the end of 2012, the Brazilian Army had drafted all the system requirements and was able to launch a competition to acquire the new system.

## The Selection Process

The Brazilian Army's Land Operations Command (the Comando de Operações Terrestres – COTER), which runs the army's Command Staff Training Center in Santa Maria, was accountable for the selection process. COTER's wide remit includes responsibility for the preparation and employment of land forces in accordance with the policies and strategic direction of the army's General Staff. Within this context, a primary function for many years has been to focus on simulation as a means of preparing individuals and units for the stresses of operations.

“Since the turn of the century, the Brazilian Army has been carrying out a profound transformation process, in which COTER and constructive simulation, have had an increasingly prominent role”, said **TC (Lt. Col.) Sergio Martins Rocha** who has been working at COTER's simulation division since 2005.

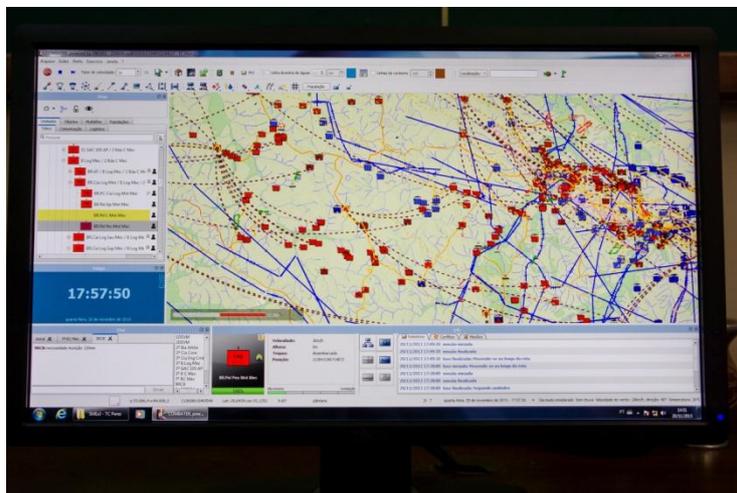
Following the initial tender to industry, COTER narrowed down the selection of local integrators to seven; five of these candidate solutions were powered by MASA SWORD – early evidence that MASA's product provides an the range of benefits and functionalities that COTER was looking for. Once the electronic bidding process was over, the No 1, 2 and 3 best bids where all based on SWORD. In the event Decatron, through their consulting branch RustCon, a Brazilian Strategic Defense Company, was selected to produce a SWORD-empowered, cutting-edge simulation for training centers across Brazil for the foreseeable future.



*Brazilian troops using a bespoke SWORD solution in a recent exercise*

## **Why MASA SWORD?**

SWORD's complete fulfillment of the system specifications defined by COTER, and the technical validation session, done at COTER with RustCon after the electronic bidding, secured the contract for the MASA/RustCon partnership. Developed as an aggregated, constructive simulation<sup>1</sup> run by an AI engine that creates unprecedented high-level automation and realism, the product offers unique behavior modeling. Command agents distribute orders to subordinates, react dynamically in the face of events and execute missions with respect to a customer's bespoke operating doctrine. These characteristics are all delivered with the required excess capacity to reproduce large-scale military maneuvers involving thousands of units – over areas typically up to 1,000 x 500km and beyond depending on the terrain – in order to produce a compelling package. Furthermore, SWORD's inherent elements also include adaptability, complete customization options, an intuitive operating system, rapid deployment, an open simulation platform, accessibility via the cloud, and multi-language support.



*A screen shot of COMBATER powered by SWORD taken during the exercises*

## **The Project**

COTER therefore purchased SWORD, which was adapted by RustCon's engineers with the support of MASA's consultants, to create COMBATER – a bespoke, next-generation AI-based simulation powered by

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<sup>1</sup> Constructive simulation uses computers and software to simulate both friendly and opposing forces (referred to as Computer Generated Forces or CGF). The benefits of such a system are that unit and formation staff can be trained without deploying higher and lower control (HICON/LOCON) personnel, flanking formations or a civilian population (CIVPOP). Costs are also saved by training these forces in a classroom without the need to deploy into the field.

SWORD. Specifically developed to improve C2 training within the Brazilian Army, COMBATER's use in its inaugural exercise involved commands and staffs from the 6<sup>th</sup> Armored Infantry Brigade based in Santa Maria, the 8<sup>th</sup> Motorized Infantry Brigade based in Pelotas and the 3<sup>rd</sup> Motorized Cavalry Brigade based in Bage; in all, 50 personnel operating alongside five MASA and four RustCon consultants.

An essential characteristic in SWORD's selection was its ability to be easily adapted to the military doctrine of the Brazilian Army and integrated with existing equipment. "The MASA SWORD solution is indeed very flexible, which was a key factor in facilitating the customization to the Brazilian doctrine in the new COMBATER system" said **João Tronkos, Senior Executive at RustCon**.

The adaptation work performed by RustCon includes the translation from English to Portuguese of the system interface and user manuals and the customization of all simulation reference data, replacing generic NATO-based equipment and missions with actual Brazilian material and military doctrine; besides the normal mission fine-tuning process, a special effort has been carried out to recreate those missions, around 15% of the total, that are specific to the Brazilian Army because of the country geography and the special capabilities the army developed to tackle it. In addition to equipment and missions, Brazilian military units and terrain have been added in order to create the most realistic possible scenarios.

Thanks to SWORD's advanced software architecture, the adaptation effort carried out by RustCon, using SWORD's toolset, allowed the Brazilian Army to have a fully customized system while taking full advantage of the software product: all changes to the standard product, including the customization of the military doctrine, reside in external XML and script files and are independent of SWORD's simulation core; this allows the Brazilian Army to take advantage of regular product updates – generally two major releases per year – without running the risk of compromising any of the customizations and without incurring expensive system upgrades.

### **Rapid Deployment and ROI**

The speed of the project, from contract signature to deployment, marked an unusual achievement for the Military Simulation and Training (MS&T) sector. Just six months after the contract was signed COMBATER was used to conduct Brazil's first major C2 simulation exercise.

In addition to SWORD's architecture and intuitive user interface, it's also its nature as an aggregated simulation that allowed for a rapid customization: in order to provide a realistic image and simulation of a battlefield for a brigade or division command post, SWORD needs much less information than a lower level, entity simulation, thus allowing for a smaller, nimbler system, easier to configure, fine-tune and manage. But moving from an entity-level simulation, such as the former Brazilian Army system, to an aggregate simulation required a change of mindset and a different, higher, point of view in order not to clog the system with over-detailed terrain, units, equipment and mission information that would never have been required by a brigade/company HQ.

Early indications from the November exercise, which lasted three weeks, suggest that SWORD (via COMBATER) is offering an immediate return on the Brazilian Army's investment. Consequently the product's status as an **efficient** training tool has been independently verified; encouraging existing and prospective customers to either broaden their investment or investigate the unique benefits of this product.

"The recent exercise held at the Command Staff Training Center, has already demonstrated that constructive simulation has a lot to offer as a cost-effective training tool; with MASA's equipment providing the most flexible, and advanced solutions currently on the market", said **TC (Lt. Col.) Sergio Martins Rocha**.



Left: COMBATER rapidly delivers returns on investment during the recent November exercise  
 Right: MASA technicians working alongside Brazilian Army personnel

The exercise, which marked the halfway point of MASA's existing project with the Brazilian Army, has indicated that SWORD's remarkable speed of deployment has been matched by important returns on investment regarding price, resource deployment and training efficiency. "Based on current results, I believe that the Brazilian Army could reduce the personnel required to provide brigade-level training by 30%", said **TC (Lt. Col.) Sergio Martins Rocha**. "SWORD's intuitive yet powerful user interface has reduced the operators' training time and removed the chance of mistakes when entering the trainees' orders into the system. The high automation level made possible by SWORD's AI technology has allowed us to reduce the number of operators required to control the simulation: hence our recent ability to launch larger exercises with fewer resources".

### An Expanding Global Presence

Initial feedback from COTER since purchasing SWORD has been extremely positive. The tool is currently located at one training center in Santa Maria; but the Brazilian Army has already announced its intention to equip an additional five training centers with SWORD-powered engines by 2017. This development comes on top of growing demand across the globe.

Armies and systems integrators in Denmark, Ecuador, France, Peru, Sweden and the USA have taken advantage of SWORD's unique benefits encouraging those within MASA to adopt an optimistic tone.

"We see a vast potential for SWORD throughout South America", said **Juan-Pablo Torres, President and CEO of MASA Group**. "The Brazilian Army officers in charge of the deployment of COMBATER, powered by SWORD, have expressed to us the greatest satisfaction with the product and services provided by MASA to date. They have already expressed the intention to enlarge the scope of the initial contract, signed back in May 2013, not only to deploy SWORD across the five upcoming training centers, but also to exploit the use of SWORD beyond training".



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