

simulator that is now being installed and our COMBATER [a version of MASA's SWORD] constructive training system is now being regularly used and we plan to build a new building to house that system in the near future.'

During MTSN's visit to Brazil, the 3rd Army Division was undertaking a constructive training exercise using COMBATER (see boxed text).

Fire support

As well as this investment in constructive training, the Brazilian Army has also recently bought two fire support simulators (SAFO). The first of these devices is located at the military academy at Resende near Rio de Janeiro and the

second is currently being installed in Santa Maria.

The latter is being housed in a purpose-built 4,500 sq m complex known as the Agulhas Negras Military Academy, which includes five buildings that are used for accommodation for visiting units, classrooms and the SAFO simulator. The simulator has been built by TecnoBit, a Spanish simulation company with offices in Rio de Janeiro. SAFO, (Simulador de Apoyo de Fuego), is designed to provide training to all members of the artillery battalion including forward observers (FO), fire direction centres (FDC) and command post personnel as well as gun detachments.

SAFO will train crews for the Brazilian Army's self-propelled and towed artillery

battalions as well as for the 120mm heavy mortars that form part of infantry and armoured brigades. The role of SAFO is to add a significant element of simulator training to ensure that units are fully trained before embarking on live fire or joint exercises.

Modelled on the Spanish Army's SIMACA artillery simulator that is located at the Spanish Artillery School in Segovia, SAFO is certainly a sophisticated and comprehensive simulation system. Featuring indoor and outdoor gun lines, FO simulators, fully simulated FDC and command post cells including integration with fire control simulators and battle management systems, SAFO is an impressive facility that will be the envy of

many armies around the world.

So with the Combater and SAFO projects in train, what other developments are on the horizon?

'The idea of the CTC is to provide a single location for training where we can concentrate and focus our efforts,' explained Carrião. 'We have visited a number of training centres around the world including CENTAC at Mailly-le-Camp in France, the German GÜZ, CENAD in Spain, the USA's NTC in Fort Hood as well as Mulino in Russia and we think that we can use this experience to build a world-class facility here in Brazil.'

Efforts are now under way to improve capabilities in the live training domain. At

present, the Brazilian Army has a mix of Saab BT41 precision gunnery training and GAMER Manpack equipment. It is also understood to have a handful of RUAG equipment that is used for trials and evaluation purposes.

Armour school

The General Walter Pires Armour Training Centre was established in 1996 in Rio de Janeiro but moved to Santa Maria in 2004 due to the availability of range space adjacent to the barracks. Since 2009 the Brazilian Army has been operating the Leopard 1A5 as its main battle tank and a significant portion of the armour school's work is focussed on this vehicle. A total of 220 refurbished 1A5 models were supplied

by Krauss-Maffei Wegmann (KMW) from former German Army stocks.

'Our philosophy is to make the most use of simulation as possible, both to reduce wear and tear on the vehicles and to prepare our crews and commanders for different types of mission,' explains Lt Col Eickhoff, the deputy commander of the Armour Training Centre. 'These simulators include systems for vehicle training, gunnery training, commander training and tactics training.'

The Leopard 1A5 vehicle-specific simulators were supplied by KMW and include two turret trainers and a driver trainer as well as deployable desktop simulators. Each of the turret trainers are integrated with Saab's BT41 laser

COMBATER IN FOCUS

Liberdade Azul was a three-and-a-half day constructive training exercise conducted at the Brazilian Army's CAA-Sul in Santa Maria, Rio Sul during July 2015. The exercise was designed to test Brazil's 3rd Army Division as well as component cavalry and mechanised brigade and battalion headquarters staff.

The central facilitating element of the exercise was COMBATER, a development of MASA's SWORD, an artificial intelligence-based constructive training system that is now in service with 16 customers throughout the world. The Brazilian Army selected MASA in March 2013 following extensive testing and evaluation with the contract being awarded to the company's in-country partner, Decatron.

Following a series of exercises, an updated version of COMBATER was delivered in May 2015. Exercise *Liberdade Azul* provided the first opportunity to carry out a major exercise using the latest version of the system.

One of the 'firsts' of the exercise was large-scale integration with the Brazilian Army's indigenous battle management system. The exercise also saw the participation of Brazilian Air Force personnel to coordinate support helicopter and close air support tasking.

'Simulation is one of our areas of excellence alongside command and control and armoured warfare,' said Gen

José Carlos Cardoso, commander of the 3rd Army Division. 'Our biggest challenges are always concerned with leading and coordinating our people and so simulation can help us address these demanding tasks.'

COMBATER is a fundamental part of the Brazilian Army's investment in simulation within an overall restructuring plan that calls for the adoption of improved training methodologies. Staff from CAA-Sul have undertaken visits to a number of armies around the world, including in France, Germany, Spain, the UK and the US to consider how these forces undertake their training and how lessons learned abroad can best be used in Brazil. These lessons are now being implemented.

'We are looking at a number of different projects including one to link our training area here in Santa Maria with another, 140km away in Rosario do Sul,' explained the commander of CAA-Sul, Colonel Carrião. 'We have already conducted some preliminary work in this area but the next step will be to integrate our new fire support simulator with live training and COMBATER to provide a fully integrated live, virtual and constructive training environment.'

Some of this integration work has already been conducted. In 2014, COMBATER was integrated with Saab's laser-based tactical engagement



Divisional staff monitor the progress of a brigade attack during Exercise *Liberdade Azul*. (Photo: author)

simulators using the latter's WISE software. This trial programme resumed in September at the Armour Training School in Santa Maria.

Another major project at CAA-Sul in Santa Maria includes the erection of purpose-designed buildings to house COMBATER exercises. There are currently 128 COMBATER licences being used within CAA-Sul and the plan is to extend



Although constructive exercises are computerised, there is always a need for maps and tactical unit markers! (Photo: author)

the use of the software to additional training centres and schools over the coming years.

Part of MASA's support process for COMBATER is the establishment of a competence centre where company engineers work closely with Brazilian Army staff. Part of this process has seen MASA provide SWORD licences to the Federal University of Santa Maria (UFSM)

to allow students to be trained in modern constructive simulation techniques and artificial intelligence. MASA sees this investment in local capabilities and education as vital in its transfer of knowledge to its Brazilian Army partner.

Santa Maria is Brazil's second largest garrison town after Rio de Janeiro and as such, is home to a number of defence and security activities. Many of

these are coordinated through the Tecnoparque that aims to promote R&D and manufacturing efforts through a close collaboration between the Brazilian military, academia and industry. Here again, MASA plays a leading role in providing its MASA LIFE artificial intelligence software for the development of an Astros 2020 rocket system simulator. ■