SIRA-COMMAND AND STAFF TRAINING ON BATAILLON AND ENTITY-LEVEL (A GERMAN COMBAT SIMULATION SYSTEM)

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INTRODUCTION

„Can you keep an entire army battle-ready without enough training areas to train on?" This is the question which the GERMAN ARMY had to answer several years ago. It was the starting point of a process which now gives the GE-Army the opportunity to train their staffs in a highly realistic scenario and under nearly battle conditions.
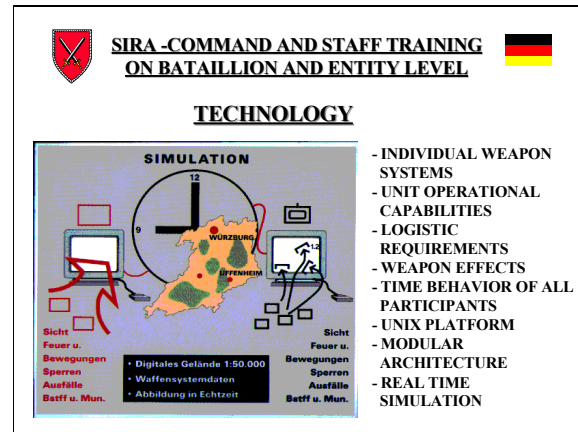
The problems were that:
- A large number of GE-Army staffs have to be trained in different tasks and have to be prepared for their missions.
- Officers, nco's and officer cadets have to be trained in tactics at battalion level.
- The training/exercises have to be done in an effective and efficient way,
- Live training on open training areas in Germany is very limited because of restrictions of safety regulations, environmental restrictions and political problems.
- Budgetary problems forced a new way of training and exercising.

SIRA, a combat simulation system for command and staff training at battalion level, based on CAE´s GESI software, was developed and tested by CAE together with professional officers from the German Army´s Tactics Centre in Hannover between July 1992 and October 1994. The System includes the philosophy of the German field manuals and mission command tactics.

During a period of about 14 month in 1995/96 seven SIRA systems were established, spread throughout Germany:

TECHNOLOGY

Combined Armed Forces Simulation Modules

GESI/SIRA is based on accurate and realistic weapon and equipment performance software. This includes
- MBTs (Main Battle Tanks),
- IFVs (Infantry Fighting Vehicles),
- anti-tank forces/equipment,
- mortars,
- engineers and artillery available at brigade and division level,
- light infantry,
- armoured reconnaissance,
- antitank and transport helicopters,
- air defence,
- recovery and maintenance vehicles,
- casualties and medical services,
- logistic services.

Supporting Package

The main supporting software packages of GESI/SIRA are the
- scenario editor
- weapon systems editor
- terrain database editor and
- after action review.

Scenario Editor

With the scenario editor the initial conditions of the exercise are defined, based on the training objectives stipulated by the exercise director.

This includes the definition of
- area of the exercise scenario,

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- the exercise start time and duration,
- the environmental conditions like sun-/moonrise and sun-/moonset, weather phenomena like clouds, precipitation, snow, fog, wind etc.
- special situations like fords, mobile bridges, destroyed bridges etc.
- task organisation of blue and red forces,
- STARTEX situation

All this will have an effect on the usage and effectiveness of weapon systems and vehicles in the combined arms battle.

Weapon Systems Editor

The Weapon Systems Editor (WSE) is used for the manipulation of simulation parameters and for the generation, modification and/or removal of simulation objects.

The WSE uses a graphical user interface. It allows the specification and editing of the following groups of parameters:
- configuration of the subunits (ranging from platoon to corps),
- weapon systems (eg vehicle, infantry group, helicopter and fighterbomber),
- performance of weapons (direct fire, artillery and sensors),
- other simulation parameters (eg supply pallets, action times, duration of events),
- tactical signs and symbols.

Terrain Database Editor

The GESI terrain database editor has an interface which currently allows data import from the following sources:
- Map picture - MRG or other raster graphics
- Elevation data - DTED or other sources
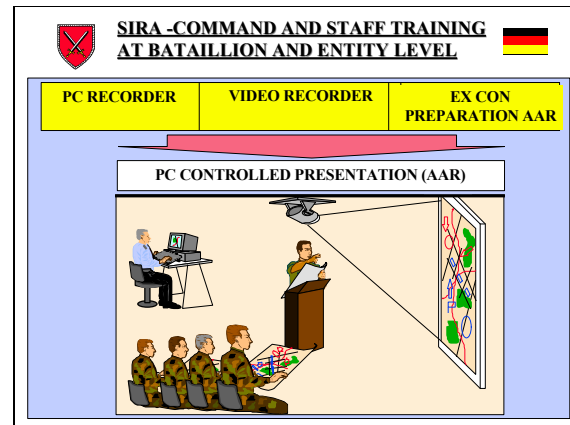- Special objects - DFAD or other sources

The database editor needs very little external data to generate a terrain database. Actually, only the map picture and the elevation model are minimally needed.

Some specific features of the terrain database editor are:
- Automatic generation of woods from the visual map copy,
- Automatic generation of briges where roads cross rivers,
- Bridge Military Load Class (MLC) definition,
- Editor draws contour lines autonomously on the basis of digital height information
- Editor defines trafficability by computing the gradients of elevation levels,
- As slopes have an effect on the speed of movement, and given the fact that the elevation profile of motorways is rarely reproduced realistically in the existing databases, the editor features a levelling function. This function allows interpolation of the motorway's elevation profile in order to avoid unrealistic variations of height.
- Enables the generation of artificial terrain.
- All digital terrain information can easily be visualised.
- Terrain databases can be combined into a single larger database.
- Automatic generation of scales 1:150.000, 1:200.000 and 1:300.000.
- Expandable import interface.

After Action Review

A powerful Instructor Operator Station (IOS) allows easy control of the exercise and its effective monitoring for evaluation, debriefing and documentation purposes.

The IOS collects, among others, data about:
- the progress of the exercise,
- the assessment of the situation at the battalion command post,
- the issuance of orders.

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For this purpose all data about the simulation is stored, as well as recordings of the communication channels. The activities in the command post are monitored with a video camera and the still images are also used during the debriefing presentation.

These data are prepared for interim reviews and final debrief. A written exercise evaluation in (take home package) is prepared for the player units according to the requirements of the exercise director.

Mission Environment

The mission environment (the battlefield) is a digitised map. The effects of terrain structure, vegetation, buildings, obstructions, weather and time of day on visibility and mobility have a direct influence on the combat situation and its evaluation. Visual representation of the exercise is displayed on screen as a military map, at a scale of 1:50.000 or larger.

The terrain is entered into the computer in two ways:

On the one hand the graphic representation is stored in a bit map file, and on the other hand the information concealed by this is stored in a digital file.

Each SIRA battle simulation centre uses a digitised area of 60 x 60 km, representing the terrain in the vicinity of the training centre.

Individual weapon systems and units, Red and Blue, with their operational capabilities and logistic requirements are the basis of the simulation. Eloquent command links make them easy to control.

Technical performance data determine the effects of weapons, movements and time behaviour of the exercising Red and Blue forces.

Last but not least: SIRA operates in real-time. Every 3 seconds each workstation receives a completely updated representation of the situation.

The system is capable of displaying virtually any tactical situation with a resolution down to individual items of equipment.

At each workstation a senior platoon leader or the operations NCO controls the tactical functions for the company's own and assigned elements, according to the instructions of the company commander. In this way he acts as interface between the player and the computer.

The SIRA exercise simulator generates the development of the situation based on the inputs at the workstation. Besides the graphical representation of the situation against the background of a map, up-to-date information about combat power, ammunition and fuel stocks, losses, operational situation and assigned missions as well as data on terrain and visibility conditions are available.

Adjacent and enemy units are displayed on the screen only if they can actually be seen by the forces controlled from that workstation.

The graphical display of the situation serves as a basis for own decisions and for reports and requests to the exercising headquarters' personnel.

This gives the battalion headquarters a realistic view of the situation. This view is the basis for the assessment and estimate of the situation, decisions, orders, measures and information on the situation or reports and requests to the brigade.

USER INTERFACE

SIRA -COMMAND AND STAFF TRAINING AT BATAILLION AND ENTITY LEVEL

User Interface

COMMANDERS AND STAFFS IN THEIR ORIGINAL COMMAND POST

The SIRA design is based on the following concepts:

The Commander and his staff exercise in their headquarters using real equipment, without having any contact with the simulation system. The commanders of the subordinate forces then

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implement tactical orders and decisions, and report in response to the situation resulting from the simulation.

Subordinate unit commanders and combat support commanders are the key players as lower control groups. They command their units in accordance with the plan and orders of the command group and feed back a stream of realistic tactical messages, based on the output of the simulation.

The company commander, who is located close to a workstation, uses his tactical map and receives situation reports from the operator at the workstation.

TRAINING WITH SIRA

Training Concepts and Goals

As mentioned above, battalion commanders of combat troops and their immediate staff are the primary trainees within the SIRA system.

However, you will also find officers and officer cadets using one of the seven systems, especially at the Army's officer school in Hannover (officer school to be in Dresden in 1998), in Munster (armour school) and Hammelburg (infantry school).

The officer corps of all services of the army also use SIRA for tactical training at battalion level.
In this way most of the officers of the German Army are confronted with realistic portrayals of tactical situations, in order to practice and apply all needed command and control procedures.

The SIRA-system enables the German Army to train:
- combined arms operations in all types of combat
- special combat operations
- general mission task

and in the near future also
- UN- Missions.

The trainees should have "on the job training" in all possible tactical situations as commanders and officers of the acting staff.

They also must learn and practice basic procedures such as "evaluation of the tactical situation" or giving tactical orders to all subordinated units. At the end all trainees should be ready for their missions.

Training Organization / Training Centres

The training will be done in small training centers called "SIRA-Bases." The German Army has 7 of these, as mentioned above.
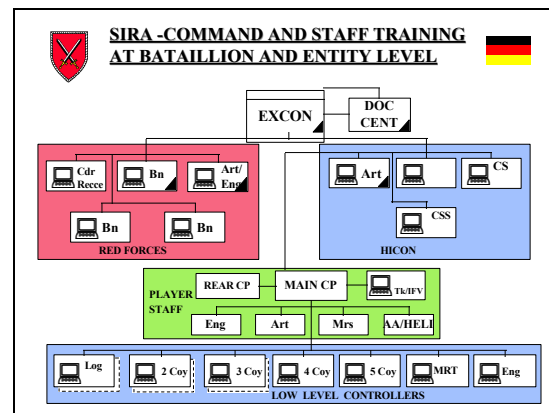
Each military base will consist of the military infrastructure in barracks (1 or 2 buildings for Computers, Communications systems and working rooms for the base- personnel) and the military staff of 3 officers, 4 NCO's and 2 conscripts.

2 x M113 APCs, with original military equipment of a battalion headquarters belong to every SIRA-Base. These will be used, if the training battalion does not bring its own headquarters to the SIRA-Base.

The trainee staff is in the field, using the M113s and the equipment including all communications means necessary. The trainees must not have any contact with the SIRA system, except during the after action reviews back at the SIRA-Base.

The high level controllers (parts of the superior brigade staff under control of the brigade commander or his deputy) and the low level controllers (the company and platoon commanders of the training battalion) are located in the SIRA building, using the SIRA system and communication equipment.

This organization is shown below:

Lessons Learned

The officers and officer cadets trained in SIRA were initially sceptical. However, the results of SIRA training are:

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- the system is highly accepted after use in tactical training
- all military decision makers must go the same way as the trainees
- acceptance is also a problem of age (generation), using modern information technology
- the systems has now has a rate of utilization of more than 80 %
- the Chief of the Army has ordered a study, to see if this system should be also used by all battalions of the army, not just the combat troops.

The main reason for these favourable reactions is the actual after action review system.
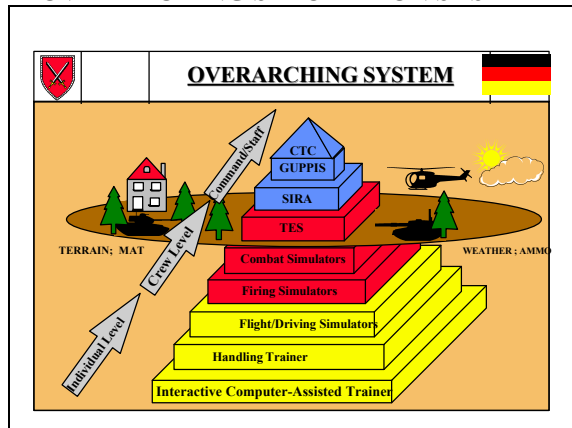
Using PC playback systems, video recorders and AAR tools (after action review tools) the commanding officer of the SIRA base is able to show the training commander and his staff ,or the trainees in another exercise or training phase, all actions they undertook during all phases of training.   So the trainees will be confronted with their own work.

To learn the lessons from acting as military leaders in a nearly real combat situation is the best way to train officers and nco`s for their future tasks in a combined arms battle.

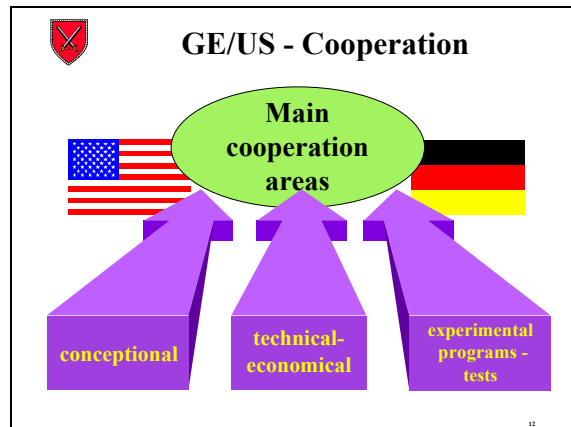## OVERARCHING SIMULATION SYSTEM

In future, all levels of military command structures of the German Army will have special systems to train their tactics and operations. These are:

- CBT (computer based training)
- Handling trainers for individual training
- Driving/Flight simulators for individual and crew training

- Firing and combat simulators for the same mission
- Company combat trainer for the company level
- SIRA for the battalion level
- SIRA Brigade for the brigade level
- TES (tactical engagement simulators) in instrumented training areas such as the GE CTC (Combat training center in Altmark)
- GUPPIS for division and corps level
- SIMOF/ALICE for higher levels.

All these systems can be linked together if necessary, from the point of view of the responsible commander, giving the training goals for his subordinated forces.
Even under these conditions and not as a must in all training situations, the overarching system simulation will work on more than one or two levels of control within the chain of command.
And this situation brings the German Army together with their US partners, developing HLA and WARSIM 2000.

GE/US COOPERATION

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Cooperation between the German Army and the US Army was initiated early this year to find out the military requirements for a close cooperation in developing HLA, WARSIM and an interface between the two systems.

Both nations found out that for the two multinational corps, the US/GE and the GE/US corps in Germany, there is a need to carry out common training in the future. They also found out that there is a special requirement to learn from each other in developing such complex and high-tech systems.

So GE and US are on the right way into a future, where the training of military leaders and their staffs, officers and officer cadets in tactics and perhaps the development of tactical baselines and procedures must be done with the use of these systems such as SIRA.

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