

The simulator of an anti-tank platoon, armed with a self-propelled antitank guided missile system «KORNET-EM»



Basic characteristics of simulator

- Constructive and functional adequacy of self-propelled «Kornet-EM» ATGM crews complex simulators
- Functional platoon radio system
- Simulated control system C4I
- High quality visualization, three-dimensional visualization of the tactical field during the battle
- Three-dimensional model of the tactical field (including real ones) with a size of 6x6 km
- Editor of tactical situation
- A wide range of conditions for tactical training and exercises
- Electronic map of the terrain with the current tactical situation

Purpose of the platoon simulator

The simulator of the anti-tank platoon, armed with self-propelled ATGM "Kornet-EM" based on the Tiger-M vehicle, is designed to carry out tactical exercises and training in the classroom in conditions close to the conditions of modern combat. The simulator is intended for solving the following tasks:

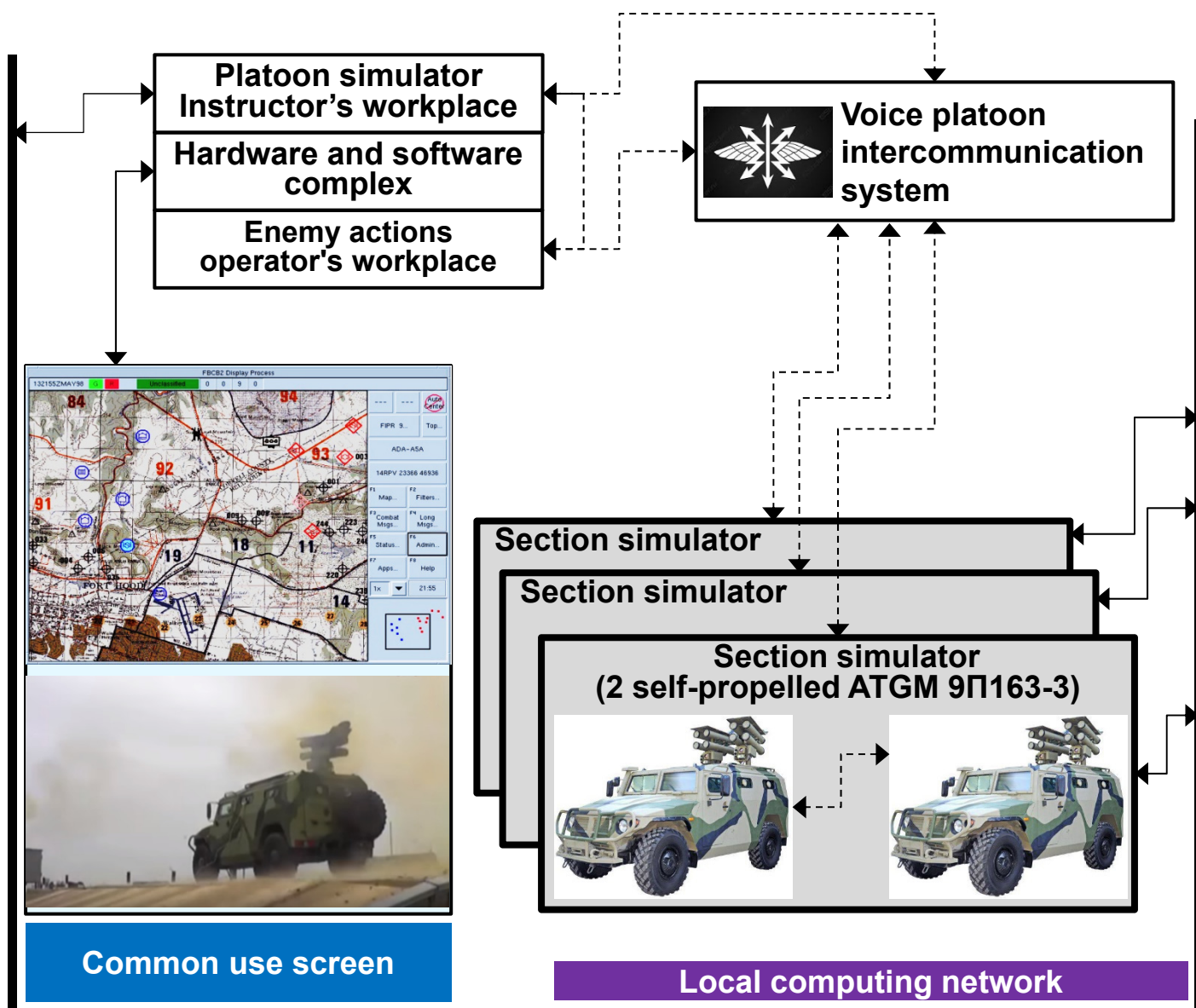
- ▣ Training of platoon commanders in the organization of command and control of platoons and their fire during the battle
- ▣ Training of sections leaders of the command and control the combat vehicles and their fire during the battle
- ▣ Coordination of the combat vehicles crews of an anti-tank platoon in the course of simulated battles
- ▣ Joint training of crews of self-propelled ATGM "Kornet-EM" for the formation and providing of stable skills in reconnaissance the targets, firing ATGMs for various targets, in different weather conditions, in different terrain, by day and night

Capabilities of anti-tank platoon simulator

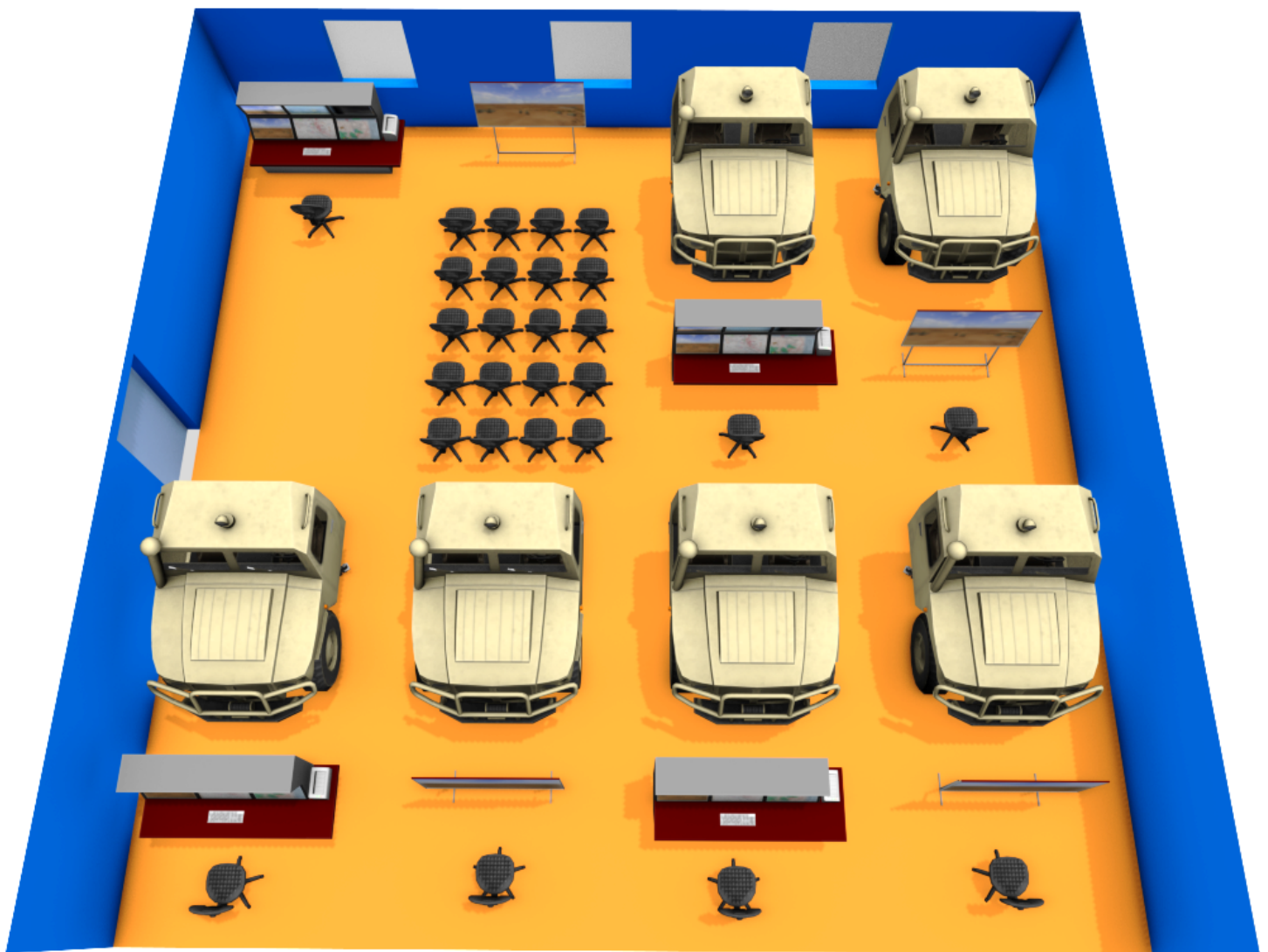
- 1 Carry out platoon training in shooting and fire control
- 2 Carry out tactical platoon training in different conditions of the situation
- 3 Carry out one- and two-way tactical exercises of crews in different conditions of the situation
- 4 Simulate the actions of the enemy units
- 5 Organization the tactical training:
 - Platoon motion in the marching order
 - Platoon deployment in battle order
 - Fight a battle in the offensive, in defense, in oncoming battle, in reconnaissance, in combat guarding
- 6 Ensuring a realistic operation of the platoon radio control network during tactical training and exercises
- 7 Display of tactical situation during the battle on the electronic map on the big screen for collective use
- 8 Control over the actions of trained commanders and crews
- 9 Integration into the training systems of the company and battalion level
- 10 The possibility of conducting trainings both as part of a platoon and autonomously in the composition of sections, as well as autonomously in the composition of crews
- 11 The choice of any terrain type for trainings - urban development, desert, coastal, mountainous, wooded

COMPOSITION OF ANTI-TANK PLATOON SIMULATOR

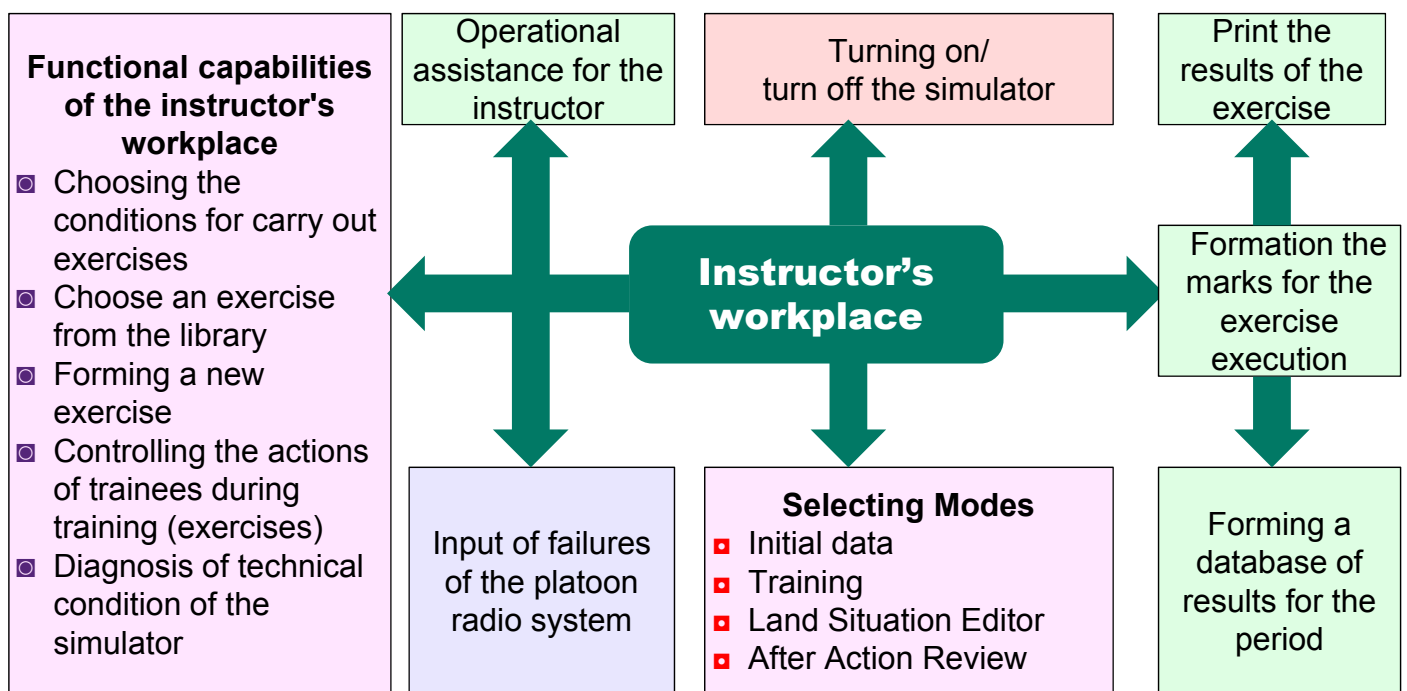
No	Name of elements	Composition of elements		Q-ty of elem., piece
		Name	Q-ty, piece	
1	Workplace of instructor of platoon simulator	Hardware and software complex	1	1
		Voice platoon intercommunication system	1	
		Common use big screen	1	
2	Simulator of anti-tank section ATGM «Kornet-EM»	Work place of instructor of section simulator	1	3
		Functional model of the self-propelled ATGM "Kornet-EM"	2	
3	Operational documentation, set			1
4	Spare parts, set			1



PLACEMENT OF ANTI-TANK PLATOON SIMULATOR

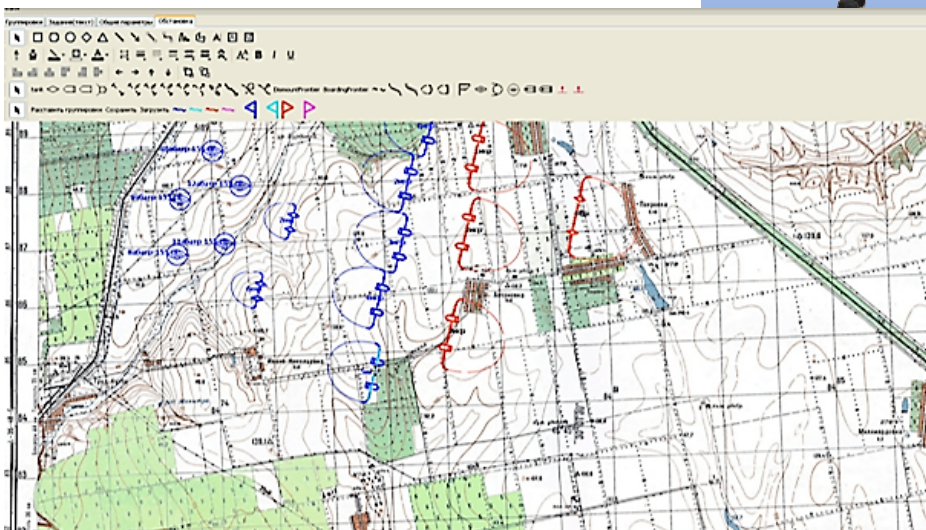


PLATOON SIMULATOR INSTRUCTOR'S WORKPLACE

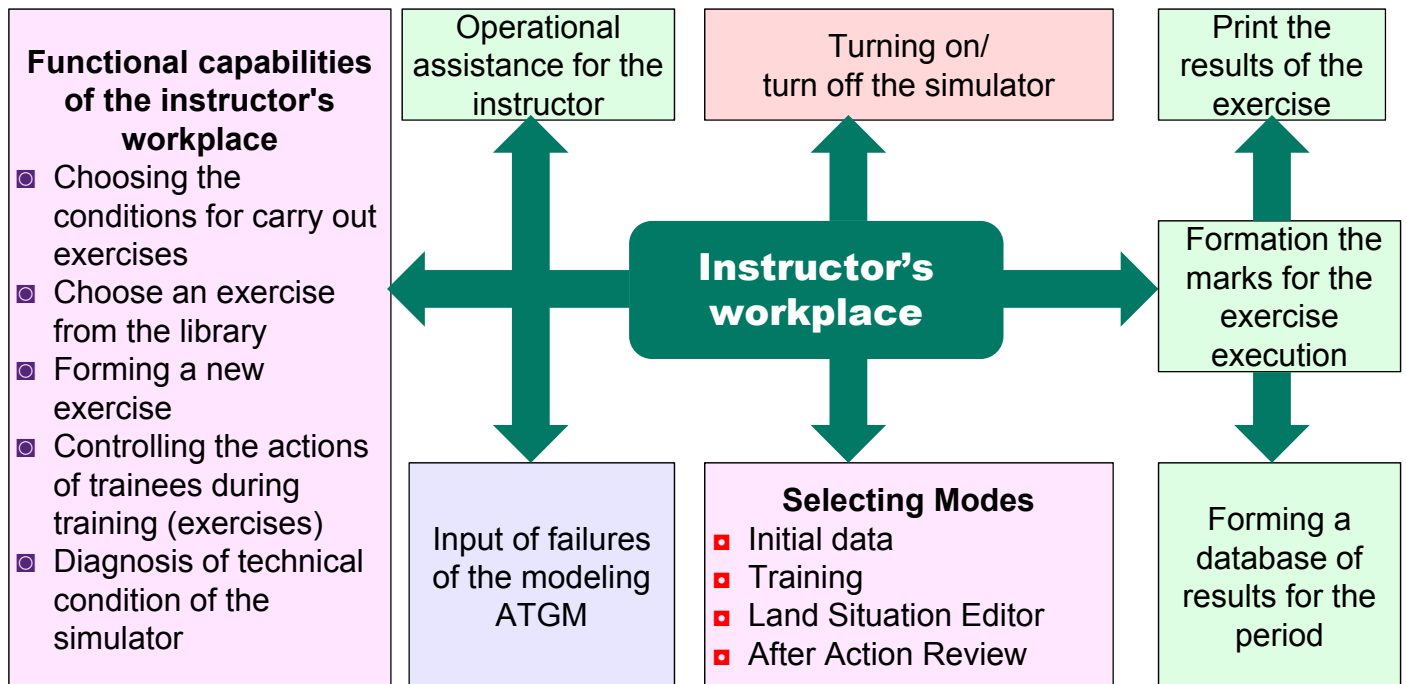


The local computer network and the voice communication system ensure the actions of the anti-tank platoon in the virtual combat space

Preparation of the initial situation for a tactical training using the tactical editor



SECTION SIMULATOR INSTRUCTOR'S WORKPLACE



FUNCTIONAL LAYOUT OF SELF-PROPELLANT ATGMS «Kornet-EM» CABIN

The model of the cabin of self-propelled ATGM on motion platform



Image of driver's seat of self-propelled ATGM



Image of operator's seat of self-propelled ATGM



CHARACTERISTICS OF SELF-PROPELLED ATGMS REALIZED IN THE SIMULATOR PROGRAM

Type of ATGM sight - TV-thermal imaging

Target tracking modes – manual and automatic

No	Parameter name		Kornet-E	Kornet-EM
1	Maximum firing range by day with missiles with a cumulative warhead, m		8 000	8 000
2	Maximum firing range by day with missiles with high-explosive warhead, m		10 000	10 000
3	Maximum range of fire at night, m		3 500	3 500
4	Minimum range of fire, m		100	100
5	Maximum target flank speed (km / h)		70	70
6	Armor penetration after Active Reactive Armor, mm homogeneous armor		1 300	1 300
7	Armor penetration without Active Reactive Armor, mm homogeneous armor		1 400	1 400
8	Penetration of concrete monolith, not less than, mm		3 000	3 000
9	TNT equivalent of thermobaric warhead, kg		10	10
10	TNT equivalent of high-explosive warhead, kg		7	7
12	Target detection range in TV mode by day, m		10 000	10 000
13	Target detection range in thermal imaging mode day and night, m		4 000	4 000
14	Target recognition range in thermal imaging mode day and night, m		2 500	2 500
15	Combat crew (man)		3	3
16	Time of transfer from marching to combat position, no more than, min.		7	7
18	Combat rate of fire, rds / min		3	3
19	Types of enemy virtual targets	«Leopard-2», M1A2 «Abrams», T-72B, T-80U		
		infantry fighting vehicles BMP-2, BMP-3		
		armored personnel carriers BTR-80, BTR-82A, BTR-3E1		
		artillery battery in positions		
		helicopter gunships AH-64, Mi-24		
20	Terrain types in the simulator library	urban area		
		Seaside area		
		desert terrain		
		mountain terrain		
		forest terrain		
21	Maximum number of targets in the platoon site		50	

THE ORDER OF CARRYING OUT THE TACTICAL SESSION (TRAINING) ON THE PLATOON SIMULATOR

The development of a tactical mission and bringing it to the trained platoon commander (platoons)

Monitoring the technical readiness of the elements of the simulator for training

Control of the fulfillment of tactical tasks by trainees and their readiness for training

Carrying out a tactical exercise

Platoon actions

Actions in the instructor workplace

Actions of the Instructor

Simulation -

- imitation battle

- Trained crews occupy workplaces in simulators, switch on simulators and intercommunication equipment
- Control of self-propelled ATGM, move forward, reconnaissance and fire
- Control the actions of the sections of the platoon and combat vehicles and their fire in the course of the task
- Exchange of commands and reports

- Start-up tactical training time
- Start of the scenario of enemy actions in the instructor workplace
- Fire enemy to the detected ATGM positions
- Stopping the enemy's targets in case of defeat by ATGMS missiles

- Display of the complete current tactical situation on the electronic map and in three-dimensional form
- Monitoring the actions of trainees
- Recording of characteristic and instructive tactical episodes
- Monitoring of radio communication in the platoon radio network

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Carrying out of analysis of exercises and analysis of actions of trainees

- Reproduction of the battle on the electronic topographic map (with breaks and repetitions for analyzing the actions of the trainees in the characteristic episodes)
- An analysis of the actions of the platoon and crews commanders and the results of accomplishing the assigned combat mission (the number and types of targets hit, the missile's expenditure, own losses)
- Identification of shortcomings (errors) and setting tasks to eliminate shortcomings

3D-MODELS OF TERRAIN

There are 3D terrain models of 5 types providing tactical training and exercises in the simulator library - urban area, seaside, desert, mountain, forest area

Characteristics of the visualization system

- detailed and depiction of the terrain, matching the colors of the image to the real background
- correspondence of angular dimensions, shape, color, contrast of local objects, vegetation, ground and air targets to real objects in the field of view of optoelectronic devices of self-propelled ATGMs
- adequacy of dynamic characteristics of mobile objects (targets) and simulated self-propelled ATGMs

View from an external controlled camera to the tactical field at the instructor's workplace and on the collective display screen



NEW FORMS OF TACTICAL PREPARATION OF THE ANTI-TANK PLATOON

The platoon simulator expands the possibilities of tactical training and objectively causes the emergence of new forms of exercises, the common features of which are:

- bilateral nature of training and practice
- actions of units of the sides in one section of the three-dimensional model of the terrain in a common tactical situation and in a common time scale
- adequacy of simulators of self-propelled ATGM platoon and virtual fire weapons used to denote enemy actions
- full algorithm of actions of the platoon leader in organizing the battle and controlling the platoon and fire during the battle
- the display of the course of combat and the results of the actions of the sides, their fire mutual influence
- reproduction of the real structure of the platoon control radio network
- the possibility of conducting simulated combat simulations in the offensive, defense, oncoming combat, actions in reconnaissance and security, in pursuit of the retreating enemy
- the possibility of repeated repetition of tactical situations, the analysis of actions of leaders and crews

Types of combat training, implemented in the platoon simulator

The training simulator battle is a training action in which the trained units operate on the simulators of crews under the command of their leaders, and the enemy is virtual, his actions are conditioned by the scenario (plan) of tactical exercises

Training battle - training action, in which the trained units of the parties operate on the simulators of the crews

New forms of tactical training, implemented in the platoon simulator

1. Training on shooting and fire control of platoons on the simulator - a form of combat coordination of platoons, training leaders of sections and platoons for methods of fire control units.

Training is conducted by practicing the issues of organization of the system of the fire and fire control of the units during the conduct of bilateral simulations or simulation battles.

2. Tactical exercises on the platoon simulator - a form of combat preparing of platoons, improving the skills of leaders in organizing combat and controlling units in combat.

Exercises are conducted by carrying out tactical missions of the sections and platoons in various types of bilateral simulator training.

TRAINING-METHODICAL POSSIBILITIES OF THE PLATOON SIMULATOR

Possibilities for monitoring the actions of students

- on the position and condition of the self-propelled ATGM platoon on the tactical field (electronic map of the terrain, view from the point of viewing of the external controlled camera in 3D format)
- on the current tactical situation
- on the protocol of tactical training (fire ATGM platoon and virtual fire weapons of the enemy, loss of the sides)
- on radio conversations of the platoon commander, section leaders and ATGM crews
- on the duplicated field of view of the aiming devices of self-propelled ATGMs

Possibilities for the formation of conditions for tactical exercises

- choice of type of terrain (urban development, coastal, desert, mountain, forest area)
- setting the time of the year (winter, summer) and day (day, twilight, night)
- choice of weather conditions (sunny weather, cloud cover, rain, fog, wind of various speeds and directions)
- assignment of the structure, completeness and initial position of enemy units, the order of their actions

Possibilities for processing and storing the results of trainings

- recording the course of tactical trainings
- documenting of results in electronic form
- archiving results for the day or for the period

Results of tactical training on the platoon simulator

- formation, consolidation and improvement of practical skills of leaders of anti-tank platoons and sections on combat management units, management of self-propelled ATGMs and fire in battle (formation of independent tactical thinking among commanders)
- training anti-tank platoons in the course of bilateral training fights in the conditions of the classroom

