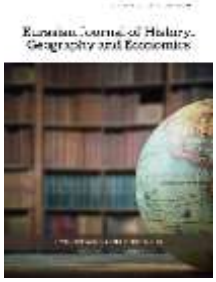

The Role of Modern Interactive Combat Ammunition Complexes in Improving the Efficiency of Shooting Training of Military Servants

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ABSTRACT

This article published a justified for a scientific approach to the creation of a modern, shooting complex, which will allow organizing and conducting high – quality training for cadets of the Academy of the Armed Forces in firearms training.

Keywords: Shooting range, shooting complex, psychological impact, modern information technology.

As in all sectors of our country, in our Armed Forces, significant work is being done to build a professional Army that can compete with the leading countries of the world, has modern knowledge and skills, and therefore can resist any aggression.

The training conducted in today's combat training system of the troops is fundamentally different from the previous training in that it focuses on the methods and methods of adequately striking modern threats.

As a result of giving sufficient importance to the organization and conduct of training in shooting training, which is an integral part of combat training, their effectiveness has increased significantly.

In order to increase the effectiveness of these trainings, modern interactive universal shooting complexes are needed in order to form, develop and acquire high skills of shooting skills from various firearms at the place of permanent residence of military personnel.Of course, such a shooting complex provided with the results of the latest advances in modern information and communication technologies not only allows formation, improvement and development of practical skills in firing firearms according to the requirements of the shooting course of military personnel of the military unit (HMEI), but also allows the leader of the training to automatically control the students' participation in the training, mastery, their achievements and shortcomings, and the students to train their mistakes and shortcomings. There is a need for complexes that provide sufficient information on shooting and their correction, and most importantly, at the same time, allow for the qualitative organization and conduct of training in accordance with the requirements of the science of shooting training within a group or combat platoon.

The combat firing ranges established in the field training grounds of the military unit (HMEI) and military districts did not allow full use of the results that should be achieved by military personnel in accordance with today's modern requirements.

Because, in such types, due to the fact that the leader of the exercise is not provided with sufficient educational and material technical bases provided with information and communication technologies for the

organization and conduct of the exercise, during the organization and conduct of the exercise, excessive time is spent on setting targets, evaluating students, organizing exercises at training points, and at the same time, military personnel cannot compare the results of previous firing and the current results, the day and training in any weather conditions has been creating a number of difficulties for the training leader and the students.

Based on the above-mentioned requirements and shortcomings, a "**Modern combat firing complex**" was established at the Academy of the Armed Forces of the Republic of Uzbekistan [2].

This shooting range is the most modern educational material and technical base of the next generation in the field of shooting training.

Using the latest advances in information and communication technologies, this combat firing complex provides servicemen with the following opportunities:

1. Creating realistic combat situations on the screen;
2. Performing basic, training control and special shooting exercises with all firearms;
3.Singularly and automatically fire;
4. Use of interactive screen, paper and wooden targets;
5. Automatic calculation and evaluation of the results of military personnel performing shooting exercises, displaying the results through the monitor, saving these results, documenting and comparing the previous and current results, as well as showing the achievements and shortcomings of the students;
6. Covering up to 100 military personnel for training at the same time;
7. Create a battlefield by creating realistic tactical situations within small units;
8. Complicating the situation by exerting physical and mental influence on military personnel during shooting exercises;
9.Using laser weapons to train military personnel before using live ammunition.

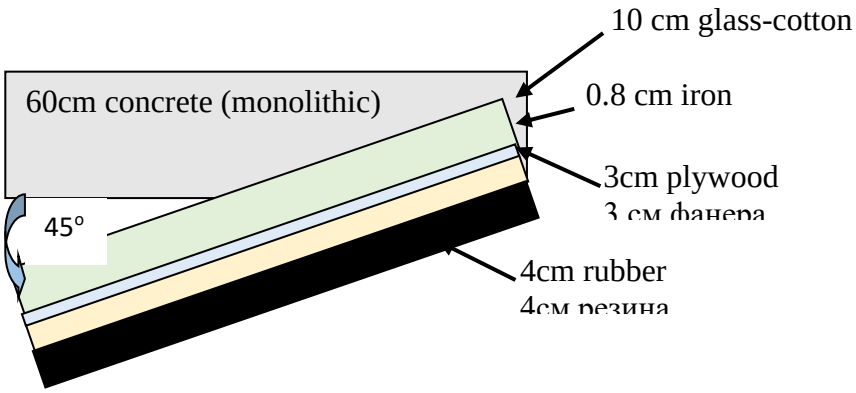

Figure 1. Bullet arrester mounted on the top of the firing pin.

Based on scientifically based conclusions, this "**Universal Interactive Combat Firing Complex**" includes the following facilities (Figure 1):

1.100x9 meter shooting range;
2.25x9 meter shooting range;
3. Ammunition distribution room;
4. Operator's room;
5.30x9 meters "Faertag (Lazertag)" military tactical game complex;
6. A class for learning the basics and rules of shooting;
7. Warehouse for storage of material means;
8. Arms storage room;
9. Weapon cleaning room;
10. Room of head of the branch;

11. Class of performance of standards in the science of shooting training;
12. Paramedic's room;
13. Ammunition distribution room;
14. Ammunition warehouse.

In the process of building this complex, special attention was paid to the following main aspects [3]: Penetrability of bullets of different calibers: In this complex, taking into account the possibility of bullet penetration of the largest caliber bullet with the highest initial speed (Table 1), taking into account the fact that practical firing exercises from small arms are carried out in this complex, the walls, upper and floor parts of the 100- and 25-meter beams are covered with 4 cm thick rubber, 3 cm plywood material and 10 cm thick glass-cotton materials were used (Fig. 2).

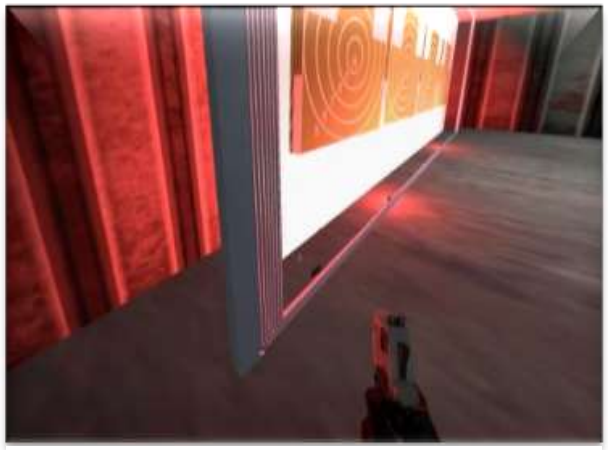

Figure 2. Laser scree

Table 1
Penetration capabilities of the 7.62x54 mm cartridge bullet of the 1908 sample

S/n	Test tools	Penetration depth
1.	Steel plate	0,6 sm
2.	Iron plate	1,2 sm
3.	Gravel	12 sm
4.	Brick wall	15–20 sm
5.	Sand or soil	70 sm
6.	Soft mud	80 sm
7.	Peat	2800 sm
8.	A tree	70–85 sm
9.	Condensed snow	350 sm
10.	Pokhol	400 sm

1. The ability to reduce the sound of bullets:

The ability to reduce the sound of the shot is based on the sound level of the cartridges used in these types of ammunition (Table 2), and methods of reducing the sound level of its exit have been developed.

In the process of solving the issue of reducing the sound of gunfire, another problem arose.

Taking into account the possibility of injury to the auditory organs of those training in the shooting range and directly participating in the training, the use of headphones with a special microphone installed and connected to

small radio stations was introduced during the training.

Headphones with special microphones not only reduce the sound of gunfire during training, but also allow conversation between the leader of the training and the students.

Table 2. Sound volume during firing of firearms of different calibers

S/n	Weapon type	*Loudness, Db*	App
1.	5.45x39 mm Kalashnikov automatic cartridge	140-160	The maximum permissible level of noise impact on the human hearing organ is 135 decibels
2.	7.62x54 mm machine gun cartridge	150-170	
3.	9x18 mm Makarov pistol cartridge	115-120	

1. The ventilation system of the firing range during training:

Ventilation of the shooting range during training is considered to be one of the most important aspects, when four or more students shoot at the same time in the range, the

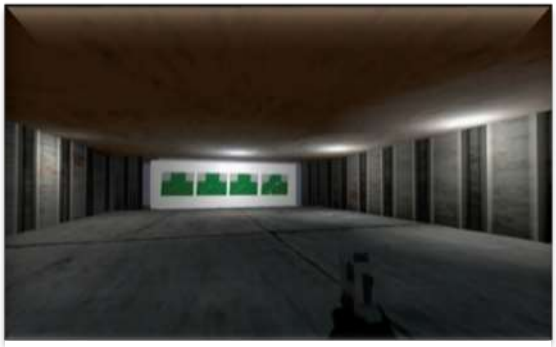

Figure 3.
General view of the 25-meter shooting range.

gunpowder gases produced by the burning of gunpowder fall into the shooters' vision and breathing organs and can be poisoned by it. So, if the weight of gunpowder in one 7.62x54 mm cartridge is 3.1 grams, as a result of its combustion, 3-4 liters of gunpowder gases are released. A person breathes once every 4-5 seconds and inhales 1-2 liters of air. As a result, it will be able to absorb the same amount of gunpowder gases.

This, in turn, can harm his health, and in some cases, he can lose human pleasure.Therefore, the air cleaning and ventilation system should have the ability to draw or replace 4-5 liters of air per second.

Sufficient lighting, maintenance of internal air temperature and fire protection were established according to urban planning norms.

In the complex, all firearms (pistols, submachine guns, machine guns, sniper rifles) available in our Armed Forces are simultaneously used for initial, training, control and special fire exercises during the day and in limited visibility situations.

The shooting range is equipped with a universal, interactive shooting complex using the latest advances in information technology, and when the screen is fired with combat bullets, a laser sensor mounted on the top determines the point of impact of the bullet and evaluates it according to the requirements of the shooting course, and the student's score is displayed on the teacher's monitor. The student's grades are stored electronically in the Academy's database throughout his studies.

In addition, more than 700 initial, training, control and special shooting exercises can be entered into the complex's computer memory according to the requirements of the shooting course and tactical situation.

According to statistical data, the military personnel of the armies of foreign countries participating in hostilities suffer 25-30% before the start of the battle, 30-40% during the battle, and 30-35% after the battle [5].

The main reason for this was that combat training exercises were not conducted as close as possible to real combat operations, and situations were not provided that would allow military personnel to imagine the theater of combat operations.

Summing up from the above, in order to accustom the cadets of the Academy to the conditions of real combat by using the methods of psychological influence in the performance of practical shooting exercises, to form the immunity of mental stability during combat operations, military-tactical games that provide practical shooting exercises with a strong

psychological effect on the organs of sense (sight, hearing, smell and skin) with extensive use of modern information technology tools in the "Universal Interactive Combat Shooting Complex" (laser tag, airsoft) room is provided.

At first, the cadets move individually and later in small groups (combat twos or threes) or in small groups facing each other and perform both tactical and shooting actions. The cadets use airsoft guns during action to ensure a full feel of the combat situation.As a result, cadets have up to 80% mental endurance and situational awareness during real combat operations.

Figure 4.
Training process in the 25-meter shooting range.

In conclusion, it should be noted that the "Universal interactive shooting complex" developed, designed and built at the Academy based on clear scientific conclusions and using the latest advances in modern information technology is not only a science of shooting training, but also a complex of tactical, physical and mental training.

This complex lays the groundwork for the development of future officers who are fully mature, mentally stable and masters of their profession who can skillfully lead units in battle.

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