

Маркин А.В.

Обобщение боевого опыта Южного крыла СВО

до апреля 2024 года





The ways and methods of armed struggle are changing rapidly. The experience of the CBO is further evidence of this fact. There is an urgent need to quickly communicate these changes to the widest possible range of individuals who can be involved in the conduct or planning of combat operations and in the training of personnel. This compendium consists of reports from interviews on tactics with individuals directly involved in CBO operations. This compendium will help provide a general picture of the tactical schemes practically used CBO. In anticipation of possible questions, it should be emphasized that in the field of training, the speed with which knowledge is imparted is far more important than the formal order in which it is disseminated. Contrary to romantic images of a clash of wills between opposing sides, in modern warfare, for the most part, the number of effective training hours on one side is at war with the number of effective training hours on the other side. The understanding of what is really happening on the battlefield can be drawn from this compendium as well, which can increase the effectiveness of training for combat. The compiler is the author of several books on tactics: "The Infantryman's Handbook", "How Can Russia Defeat America?", "Accelerated Tactical Training. Training Methods" (co-authored), "Album of Tactical Schemes for Independent Training in Small and Medium Groups," and a number of articles in the magazine "Soldier of Strike" and "Law in the Armed Forces".



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of the south wing of the
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MARKIN A.B.

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This compilation of tactical information from soldiers and officers who have fought in the NWE zone. It offers insights into the specifics of combat practice in the current conflict, as well as a sense of how the forms of warfare have changed, even in comparison to conflicts from the recent past. The collection attempts to assess the accumulated combat experience in terms of its impact on changing approaches to military training.

OVERVIEW: 1. Photo by the Russian Ministry of Defense // mil.ru
2. Tsar-TANK Mangal.

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C O D E R M A N I O N

A must read!	4
Report№ 1 of 02.09.2023	7
Report№ 2 of 17.09.2023	11
Report№ 3 of 20.09.2023	13
Report№ 4 of 23.09.2023	18
Report№ 5 of 24.09.2023	22
Report№ 6 of 30.09.2023	26
Report№ 7 dated 01.10.2023	31
Report№ 8 dated 02.10.2023	37
Report№ 9 of 07.10.2023	43
Report№ 10 dated 08.10.2023	47
Report№ 11 of 13.10.2023	52
Report№ 12 dated 01.11.2023	54
Report№ 13 dated 11.11.2023	55
Report№ 14 of 13.11.2023	58
Report№ 15 of 26.11.2023	65
Report№ 16 of 20.12.2023	74
Report№ 17 of 30.12.2023	77
Report№ 18 of 03.01.2024	80
Report№ 19 of 03.01.2024	85
Report№ 20 dated 05.01.2024	91
Report№ 21 dated 05.01.2024	98
Report№ 22 dated 07.01.2024	101
Report№ 23 of 18.01.2024	106
Report№ 24 of 11.03.2024	108
Report№ 25 of 16.03.2024	117
Report№ 26 of 31.03.2024	125
Report№ 27 dated 06-07.04.2024, 12.04.2024	130
Report№ 28 of 21.04.2024	133
APPENDIX 1: Summary of earlier reports the onuse of UAVs	140
ANNEX 2. Results of the tactical experiment	166
on the use of field fortification in defense, conducted by the	
at one of the firing ranges in the NWO zone 14-15.10.2023	166
APPENDIX 3: Problems of tactical infantry training	
taking into account the experience of the SWO	175
ANNEX 4: Tactics of infantry attacks based on the experience of SWO 2022-2023	
.....	204
APPENDIX 5. Hypothesis about cultural causes of problems	

with combat training in the army	213
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O6yasayelieo to nrochuyu!

This compilation contains reports from combat experience interviews with military personnel in the CoE area from September 2023 through April 2024. It is important for the reader to understand the limitations of these reports as a source of information in order to avoid drawing incorrect conclusions and basing decisions on them, especially in a combat environment.

There are many objective and subjective reasons why interviewed soldiers and officers may make good faith mistakes that distort the information provided.

The British legend of the Battle of Mons is considered a classic example of a bona fide battlefield error. This is a battle on the Western Front of World War I, part of the 1914 Battle of the Frontier. According to the legend, during the battle the British Expeditionary Corps soldiers, who had a very high level of rifle training, inflicted very high casualties on the advancing German infantry. As later studies showed, the British simply did not know or realize that the German infantrymen were trained to move on the run. Each fall of a German soldier to the ground (and a defection always ends with a fall to the ground) perceived as a hit on the enemy. As a result, British battle reports are filled with stories of German chains slaughtered by rifle fire from the brigades, while the Germans suffered quite skillful casualties. The British did not lie for the reports, they reported what they thought they had seen with their own eyes. But their perceptions were honestly mistaken¹.

As can be seen from this example, errors in reporting can arise from misinterpretation of the logic of the enemy or one's own troops. It is possible to include distortions in the verbal transmission of combat experience from one soldier to another. Might

¹ *Zuber Terence*. The myth of Mons: reassessing the battle. Cheltenham, Gloucestershire; History Press, 2010. [*Terence Zuber*. The Mons Myth: A Reassessment of the Battle; Cheltenham, Gloucestershire; The History Press; 2010].

There may be cases of conscious incomplete communication of information to the interviewer due to fear of liability for inconvenient information or because of a general negative attitude to the

to "rear rats". Some do not want to share the "sacred knowledge" that elevates them in their own eyes above others. Combat practices may differ from front to front, from unit to unit. As a rule, interviewees do not tell what seems self-evident and self-explanatory to them, thus the reader of the report will find the information taken out of context and the reality perceived in a different way than the interviewee intended. It is possible that individual servicemen may add something of their own, especially so-called "front-line soldiers," i.e., servicemen who are not directly on the front line. Somewhere the report writer may have misunderstood the information. The compiler no objective way of sorting out these errors. In the course of the work, the compiler tried to show the written report to the source of the information. Unfortunately, this was not always possible. In addition, the verification of the report by the source does not exclude the possible occurrence of errors in the reports. Therefore, reports should be read in their entirety and compared with other information. Information from reports should not be seen as ready-made recommendations. It should be seen as a starting point for further reflection and discussion.

A number of limitations should also be taken into account when compiling this compilation. Interviews with servicemen were conducted along a wide arc from the vicinity of Krynok in the Kherson region to the northern part of the DNR. Bcë is an area of open terrain riddled with forested swaths. Unfortunately, the experience of fighting in forested terrain is practically not included in this report.

The interviews with the soldiers cover a period of more than 8 months, during which the technical equipment of the sides and, consequently, tactics changed. When reading, it is important to pay attention

attention to the dates of the reports. It is normal for different members of the armed forces to have different opinions on some issues. Experience can vary.

In order to maintain military secrecy, the collection excludes references to specific sections of the front, except in cases where the reference is obvious due to the geographical features of the terrain, and it is impossible to describe without indicating these features. First of all, we are talking about the battles on the left bank of the Dnieper.

For the same reason, references to the party employing a particular tactic have in many cases been omitted from the reports.

We hope that the reader will keep the above limitations in mind when examining the reports.

Since the compiler has been engaged in tactical training for a long time, several analytical articles by the author on certain aspects of this subject, which are not directly related to the reports, are included in the compilation as annexes.

Oychëy № 1 oy 02.09.2023

This is from the officer's account

1. The AFU has completely abandoned attacks on open fields surrounded by forest belts. The attack is carried out by infantry inside and along the forest belts running from north to south. Forest belts perpendicular to the direction of movement across the open field are not stormed. Defensive lines of trenches with cells with embrasures on the field become practically useless, since the assault is not directed towards the from the field, but along the trench from one of its flanks. In this case, the general trajectory of the offensive along the forest belts can take the form of a strongly broken line, in some places running parallel to the front line, and in some places even leading backwards, deep into the territories controlled by the AFU.

2. Forest belts are chosen for the attack, which are maximally covered from the sides by the topography of the fields surrounding the forest belts (hillocks, micro-hills, etc.). Very often the unharvested fields are covered with plants 1-1.5 meters high. As a result, it is as difficult as possible to shoot through forest belts or terrain in the immediate vicinity of forest belts along which the AFU is advancing, from the sides (flank) of forest belts occupied by defending units of the Russian Armed Forces. The significant distance (about 1 km) of one forest belt from another, which is typical for the conditions of the region, has a strong impact. This makes it impossible to conduct effective fire with most of the weapons readily available to the defenders (small arms, AGS).

3. In the initial stages, a mechanized clearing of the forest belt by a tandem of tank + BMP/APC was used. In this scheme, the tank goes first along the forest belt at a distance of approximately 7-10 meters from it and approximately parallel to it, almost "leaning" against the forest belt. The tank's gun is aimed at an angle of approximately 20-30 degrees to the direction of travel. As the tank

moves forward along the forest belt, it shoots through the forest belt.

with oblique fire into this wooded area. The tank is not visible from the defender's position as it is covered by trees. At a distance from the tank (somewhat behind the tank and farther from the forest belt), covered by the tank hull, an APC (BMP) is moving towards the tank. Its barrel is pointed at an angle of about 60-70 degrees to the direction of travel. It fires its machine gun/gun into the forest clearing in an area roughly corresponding to the projection of the tank hull on the forest clearing. This makes it impossible for infantrymen to fire an RPG at the tank or in pursuit after the tank has passed the defending positions, when the tank can no longer see the section of the defended position it has . In recent times the defending forces have begun to use "mine whiskers" - relatively short minefields laid roughly perpendicular to the line of the forest belt to make movement along the forest belt in the immediate vicinity of it impossible. The tactic of mechanized clearing of forest belts therefore began to .

4. In general, the offensive inside the forest clearing is conducted by two echelons of small combat groups. The typical formation is: a) 3 soldiers - the first "opening" line (very conventionally - in a "chain"), b) 2 groups of 3 men - the second line - the support groups. Often less trained and worse armed soldiers are assigned to the 1st line, and better trained and better armed soldiers assigned to the 2nd line. There are two courses of action:

4.1. When encountering defender positions, while the 1st Line is engaged in a short fire fight, the soldiers of the 2nd Line use silent weapons to attempt to engage the defender positions.

4.2. The 2nd Line groups run out of the tree line, one to the right and one to the left, and literally run along the tree line (parallel to it) across the field in the direction of the defender's position. Due to the dense foliage and grass they are not visible until they come within firing distance at point-blank range from the flanks (two-way half-cover). After that, the defenders, who have suddenly come under fire from three sides, are destroyed or withdrawn.

Considering that a standard cell (trench section) of the defenders includes a garrison of 3-4 soldiers, such a lightning-quick withdrawal

In the flank on both sides, the defenders are usually unable to parrie.

A significant negative role is played by excessive intervals between cells (trench sections) of up to 100 meters, which is beyond the range of visibility and, as a consequence, mutual fire support within the forest belt. These intervals are often due to the fact that defensive positions are not deployed in the right direction - they are built to repel an attack across the field, while it is flanked by the forest belt.

The lack of trench plots extending beyond the forest belt is a major hindrance to defensive combat. Optimally, the position section should include "whiskers" extending 10-15 meters beyond the forest belt itself into the field approximately perpendicular to the forest belt itself.

5. A negative role was played by the habit of housing troops in dwellings in populated areas outside the defensive position itself. The calculation was based on the fact that the shift on duty in the field positions would be able to delay an attacking enemy for a time sufficient to allow the bulk of the troops from the settlements where they lived to reach the field defensive positions. The settlements themselves and the houses comprising them were not prepared for defense. In practice, at the beginning of the offensive, strikes were launched against the houses where the soldiers were quartered. While most of them were digging up their fellow servicemen buried under the rubble of their houses, the enemy broke through the weakly occupied positions. It is to be credited: the error was recognized by the command and vigorous measures are now being taken to "evict" the soldiers from the populated areas into forested areas. From the positive experience of the defenders: in some cases, a hidden passage of communication was made from the house to be entered to the house where the soldiers lived.

6. When troops occupy positions prepared in advance by civilian contractors, they do not equip them for the convenience of defensive combat. There is no understanding that they are only receiving a preliminary preparation for a position.

7. When artillery fire hits their positions in the forest belts, the soldiers into the field and lie down in the grass. This is often enough to minimize the damage caused by shelling.

FROM THE AUTHOR. There are references to the use of a dash from the trenches into the open during shelling as far back as the Finnish War.

8. Long mine clearance shells are used for the high-speed construction of driveways and passageways through forest belts (across).

9. The offensive often begins around 16.00 to allow several hours of intense fighting to be followed by darkness in which to entrench. As a rule, a special entrenchment echelon is used, which does not fight but only establishes defensive positions in the newly occupied section of the forest belt.

10. Stories of the enemy going into battle under the influence of drugs or alcohol often stem from a misunderstanding of the adrenaline rush that most soldiers experience when moving into an attack. Assault units do not practically set up their own positions.

Oychëy № 2 oy 17.09.2023

This is from the officer's account

1. The "sneak attack" tactic is used to seize micro bridgeheads in the forest belts defended by our troops, which run in a general direction from north to south, i.e. approximately perpendicular to the line of contact (hereinafter referred to as the LBC). As a rule, troop defenses in these forest belts are built in an echeloned manner - trenches are set up across the forest belt being defended at a distance of about 100 meters from each other. Forest belts are blocked by several defensive positions. In the dense vegetation of the forest belts, the trenches are out of sight of each other. The area visible from a trench is 30-40 meters. The fields on both sides of the forest belts are heavily overgrown with grass and other vegetation, as they have not been cultivated for two seasons. The height of grass on the fields is approximately in the range from waist-high to "up to a man's chest. Taking advantage of the overgrown fields at night, small assault groups of 3-4 men crawl to approximately the middle of the first gap between the trenches of our troops blocking the forest belt and attack the nearest trench to the Ukrainian positions from the rear. The fire is conducted with weapons equipped with silent firing devices. Given the impossibility of providing fire support from the next trench (the assault group detects itself by firing and crunching of branches in the forest belt only when it is between the positions of the defenders - its fire will be directed in the direction of its own positions; moreover, from the next defensive position the forest belt is simply not visible at a sufficient depth to conduct any aiming fire), the garrison of the position finds itself alone with the assault group. On the side of the assault team is the effect of out-of-area attack from the rear. The crawling across the field is carried out under cloaks that are opaque to thermal imaging.

The cape material can be used, lined with a copper thermal blanket, or any other means of making a cape from scratch. To attach the cape to the helmet, small horn posts are attached to the helmet, to which the cape is attached. To create an air layer between the body of the crawler and the cape, so that the cape does not take on heat from the person and does not become distinguishable from the general background of the place, the crawler wears a backpack on his back. To avoid the need for the crawler to lift the cloak to look at the terrain ahead of him/her, the crawler's navigation is carried out using everyday electronic navigation devices, where a map of the terrain is downloaded and the route is laid out in advance. It should also be noted that copter-type surveillance assets equipped with high-power thermal imaging cameras do not, as a rule, due to the risk of being lost, head forward to survey fields that could be infiltrated in the above manner. They observe from a hovering position approximately in the vicinity of their elevation points, which are about 1.5-2 km from the edge of the forest belt occupied by the defender, close to the enemy. They do not detect creeping groups.

2. One way to keep troops ready for sustained offensive operations that exhaust the defensive is through continuous micro-rotations of troops in the LBS. Soldiers stay at the LBS for about three days, after which they are rotated on a schedule. It is not the whole unit, but small parts of it, but constantly. In doing so, there is a risk of loss in constant rotations, considering that keeping fresh, rested troops on the LBS ready for offensive action is more appropriate than reducing the acceptable losses they inevitably incur during rotations.

Oychëy № 3 oy 20.09.2023

Taken from the words of the battalion commander

1. During intense general combat, Russian troops use up most of their accumulated ammunition stockpile (primarily for heavy/group weapons) and are forced to use it sparingly. The remaining stock of ammunition is saved by the defending troops to repel massive offensives. As a consequence, the defeat of the enemy on the distant approaches is significantly reduced, allowing him to bring in forces from the depths with significantly lower losses. Firepower is limited when targeting small groups or individual enemy defensive positions. Changes in the volume of fire are read by the enemy. This opens a window of opportunity for the enemy to attempt to achieve success with infantry forces. He makes frequent infantry attacks in small groups (initially 15-20 at the start of the counteroffensive, now 5-7).

FROM THE AUTHOR. The general logic of the enemy's actions can presumably be interpreted in the following way. First, a large part of the ammunition of the Russian units is "taken away" by means of an all-arms intensive battle, which turns the battle from an all-arms battle into a predominantly infantry one. Then, through frequent infantry attacks in small groups along the entire front, the enemy tries to find units that are unstable and push them out of their positions. After the enemy has made a favorable change in the front configuration by squeezing out the unstable units, conditions are created for a new all-arms battle.

2. According to recent testimony from a prisoner, they are trained to operate in groups of 15 men in infantry combat. The first five are to

only to identify enemy firing points, after which it retreats to the side. The next five consists of assault troops, who must capture the target. The third five is the entrenchment team.

FROM THE AUTHOR. It is known from previous information that only the second (assault) sub-team should be trained, motivated and well-equipped. The first and third sub-teams may consist of relatively poorly trained and poorly equipped troops. The reinforcement sub-teams may not be armed at all. Therefore, the presence of a large number of poorly trained AFU soldiers (including among the captives) should not be misleading. Up to two-thirds of the troops can fall into this category without losing the quality of their utilization through the tactics employed.

The following information (up to the "other" section) is based on combat experience during the initial period of the Ukrainian counteroffensive, June 4-24, 2023.

3. One of the tactical methods of approaching an attacked left flank on armored vehicles is "shuttle rolls" with a gradual advance. Armored vehicles deploy in a line and work in pairs. One vehicle travels a certain distance forward, then it starts moving backward without stopping or turning. At the moment the first car starts moving backwards, the second car starts moving forward. At the same time, this second car, moving forward, passes beyond the conditional line where the first car stopped moving forward and started moving backward. The first car, moving backwards, does not travel the whole distance it traveled from the starting point, but only a part of it, and then starts moving forward again. The second car, in its turn, also starts moving backwards. In this way, both cars keep moving, periodically changing directions from forward to backward, but at the same time getting closer and closer with each approach.

to the attacked position. The result is that a pair of vehicles approach the attacked position according to the principle of "The difference is that the car never stops, but is always in motion. The trajectory of the vehicle becomes unpredictable, since it is impossible to predict when the forward movement will be replaced by a backward movement. In the meantime, the armored vehicles are subjected to heavy suppressive fire during the approach. The distance between forests (approx. 1000 m) is covered in about 15 minutes by a line of armored vehicles when operating in this way.

4. Another tactical method is for armored vehicles (about 10) to move towards the forest belt under attack in a column one at a time. All vehicles in the column fire in a "swoop" pattern (one to the left and one to the right) at the wooded areas surrounding the field, and the front vehicles fire forward as they move to the point in the wooded area where the infantry is planned to land. The approach is made at high speed so that the forward armored vehicles reach the edge of the forest clearing under attack. The first vehicle stops when it literally bumps into the wooded area. The infantry disembark from the rear of the armored vehicles. By the looks it, after the rush, the infantry deploys in a relatively orderly manner to either side of the armored vehicle. Then, without throwing grenades, relying on small arms fire, they enter the wooded area under attack. Except for the front few vehicles, the others withdraw before reaching the forest belt.

FROM THE ORIGINATOR. Maybe these other vehicles only solve the task of suppressing side forest belts and reaching the attacked forest belt is not planned from the beginning.

Minefields between forest belts are mined in relative proximity to the defended forest belt. Therefore, maneuvers of enemy armored vehicles in the middle of the field are carried out outside the mine threat zone. Prior to the start of the attack, the field may be checked for minefields approximately 2/3 deep by tanks with minesweepers.

5. The tactic used for exhaustion fire is to position the armored vehicles inside an enemy-held wooded area that runs roughly parallel to the line of the wooded area where our troops' strongholds are located. After that, the armored vehicles' large-caliber machine guns fire at our troops for a long time. Attempts to hit the armored vehicles with mortars and even MLRSs do not, as a rule, cause damage to the enemy. ATGMs are ineffective due to the enemy's location between trees and bushes.

6. There were cases of a column of armored vehicles, led by a tank, moving to attack along the road running along the forest belt, with all armored vehicles firing obliquely at the forest belt on the move.

7. Groups of infantry (15-20 men) attacked in formation "in a serpentine pattern, almost in a column of one. In this case, after the beginning of fire contact, the "snake" lay low. Further forward movement was carried out in a "caterpillar" pattern, i.e. two or three soldiers from the head of the unit The "snakes" run forward, and after they have completed the run, the next two or three groups make a catch-up run. Then the next group would make the same catch-up run, and so on to the end of the "snake". The distances between the men after the run were the same as they were when the whole "snake" was moving. The general line formation of the "snake" was also maintained.

8. The small minefields blocking the forest belts across do not stop the enemy infantry from advancing inside and along the forest belts. One or two attackers are blown up on them, but the attack continues.

9. According to circumstantial testimony, there was a case when a group of our soldiers was trapped inside a wooded area between two positions captured by the enemy. Retreat across the field could have resulted in the death of most the group. To withdraw the group, mortar fire was directed at both enemy positions. The group broke out of the encirclement by passing one of the enemy positions along a road that ran next to and roughly parallel to a wooded area. Our soldiers passed only few meters from the trenches occupied by

the enemy. Exit scheme

was as follows: while our mortars were hitting the enemy, our soldiers were building up for a rush. After receiving information that our mortars were ceasing fire, a group of surrounded soldiers would rush past the enemy positions. And immediately after passing the enemy positions, our mortars would fire on them again.

Other

10. The enemy often uses attacks in very small groups of 1-3 men against individual trenches to probe the stability of the soldiers in the defense. Unstable soldiers in individual forward trenches will simply withdraw at the outset of the engagement, regardless of the number of attackers.

11. When fighting inside a wooded area, the enemy makes a sudden dash from his position about 100 meters with a group of 3-5 men and entrenches at the reached line. Then, after the occupied positions have been re-equipped, a new similar dash is made. It is not easy to fight such small trenches at a time when our troops are amassing ammunition. The ammunition situation does not allow us to waste shots of heavy weapons, and attempts to drive the enemy out with infantry may be inexpedient from the point of view of the available force and expected losses. This is how the enemy slowly occupies the forest belt.

12. There have been cases of boundary marking with flare shells. This is due to the fact that cluster munitions have similar ballistic indicators.

Oychëy № 4 oy 23.09.2023

Recorded from the words of enlisted and officer personnel

1. An officer who has had to provide information to correct the fire of tanks, mortars, artillery and MLRSs pointed out the practical inconvenience of having to adjust different weapon systems in different ways. For example, he said, tankers ask for adjustments in units of angle, while artillery ask for adjustments in meters relative to the sides of the world. According to him, it would be desirable to develop common correction methods for all weapon systems.

2. In the course of the AFU's artillery fire, there was a steady combination of strikes by different types of artillery systems when firing on a single target. For example, there are two bursts of mortar mines, then one burst of a cluster shell, then two of mortar mines again, then another cluster shell. The combination can include artillery high-explosive shells, Polish silent mines, and cluster shells.

FROM THE AUTHOR. It is possible, of course, that this is simply a coincidence of several artillery systems working simultaneously on the same target but it may be a deliberate combination of attacks in order to increase the effectiveness of the fire. In the latter case, the enemy must have coordinated the timing of the firing of the different artillery systems.

3. If an enemy UAV is caught by the anti-drone gun and is hovering in one place, enemy artillery fires at the UAV's hover site. The enemy rightly assumes that the anti-drone gun crew and soldiers attempting to shoot the immobilized drone with assault rifles are relatively close to the hovering location and

are standing at full height in the open. There is a chance of hitting them. This tactic has the effect of creating soldiers who will not come out of hiding to fire at an immobilized UAV.

4. The soldiers saw only one way the AFU used armored vehicles in the attack: the armored vehicles bring the infantry directly to the defended positions, and the landing takes place in close proximity to them. No infantry deployment in the field was observed.

FROM THE AUTHOR. This attack pattern somewhat devalues the "classical" arrangement of loopholes in the bunker of the bunkers, which is designed to allow the entire unit to fire at a range of 100 to 400 meters. Small arms targets do not appear further than 20-40 meters from the defended bunkers, where the bunkers create many dead, unobservable zones. A full view and penetration of the strip directly behind the barrier to a depth of up to 40 meters not only by frontal fire, but also by oblique and flank fire (due to outrigger cells and appropriately deployed battle stations in the barrier) becomes more important. In fact, only grenade launchers fire at the front, and machine gunners fire at possible enemy accumulation zones. It may be necessary to have some kind of combined system of loopholes in the barrier, suitable for long-range and ultra-short-range firefighting.

5. To make it harder for UAVs equipped with thermal imaging cameras to detect them at night, the soldiers press themselves against tree trunks when they hear the drone, believing that the trunks are also warm. However, they say that this method will not work in cold weather.

The "other" section is followed by information from the mortar crew.

"Basil" put on the automobile. A car with "Vasil-

The "com" operates at a distance of approximately 1.5 km from the forward positions and fires at a range of 3.5-4 km. When the enemy is detected (infantry concentrations, lightly armored vehicles), the artillery chief calls for a vehicle with a mortar, they drive to an open position in the field and strike. Given the close proximity to the forward positions, they can reach the firing point in 5 minutes.

6. In the cold season, after the leaf litter has disappeared, the expectation is that they will not be able to stay in the holding area as close to the forward positions. In their opinion, they would have to be about 20 minutes away, which would significantly reduce their reaction time to enemy sightings.

FROM THE AUTHOR. A possible solution is to have multiple air-covered shelters per vehicle, where the enemy realizes that the vehicle is hidden under one of the multiple shelters, but cannot determine which one.

7. The team noted that it took 1.5-2 minutes to receive instructions to adjust their shots, which was very slow. The probable cause was cited as the use of a single surveillance drone on multiple targets. For a mortar vehicle traveling in an open area, it is desirable to be able to adjust as quickly as possible.

8. The crew said that they were able to evade a kamikaze drone's OPV in an area where three of our tanks were located with jammers installed. It is desirable that mortar vehicles also be equipped with such jammers.

Other

9. During rain, the aperture of the AK-12 diopter sight is obstructed by water held in place by surface tension.

It becomes impossible to make an aimed shot. Soldiers try to blow out the hole, but it is not always convenient.

10. When the AK-12 gas piston is fouled, the cartridge case is often not extracted from the chamber - there is not enough force of the gas thrust.

11. To reduce the risk of carbon monoxide poisoning, it is suggested to use hunting gas heaters to heat tents and dugouts.

Oychëy № 5 oy 24.09.2023

Recorded from the words of the company commander and platoon commander

1. When fighting in a forest belt, one of the most effective ways of suppressing a defending enemy is to fire underbarrel grenade launchers at trees in the immediate vicinity of the defender's trenches. Aiming at the tree trunk at a height of 3-4 meters. This method requires good marksmanship on the part of the underbarrel gunner.

2. The following clearance pattern is normally used. The clearing team normally moves inland along the tree line to an enemy trench blocking the tree line. It consists of three twos roughly in line and one twosome (machine gunner and assistant machine gunner) some distance from the front line. In line, the right and left twosome each consist of a gunner with an underbarrel grenade launcher and a machine gunner. The latter has his WOG rounds (as well as hand grenades) mounted on his back so that the rifleman with the grenade launcher can quickly draw WOGs for firing. In the center of the line is a rifleman armed with a RPG-7 grenade , Flies, Bumblebees, and an assistant armed with an automatic rifle. When a machine gun is brought into the line about 30-40 meters before the enemy trench blocking the wooded area. Then all firepower makes an intensive fire attack on the enemy position and then enters the trench by a conventionally rectilinear movement of twos to the trench.

That is, in the course of a straight-line movement to an enemy trench blocking a forest belt, a stop is made for maximum intensity fire in relative proximity to the enemy, and then the straight-line movement continues.

One of the reasons for the use of movement within the forest belt (without entering the field) by troops is the use of grenade-dropping UAVs by the enemy. Once movement is detected, enemy UAVs operate in a "roundabout" pattern. After dropping from one

The UAV is almost immediately followed by another UAV for a drop. The UAV's movement inside the tree line therefore achieves a later start of the UAV's grenade throwing as possible.

In a defended trench there are usually 6-8 enemy soldiers.

Before the frontal advance begins, an engineering reconnaissance for mines and other obstacles is conducted by 1-2 soldiers.

Flies and Bumblebees are fired by aiming directly at the enemy position, not at trees.

3. There is another scheme of attack. At a certain point in the approach to our trench the attackers come out onto the road running parallel to and in close proximity to the forest belt try to reach one of the flanks of the trench. Then they try to clear the trench by moving from one flank along the trench to the other flank. Three twos descend into the trench and two twos go along the trench space (the ground behind the barrier).

The attacking flank of the defender's trench is fired from the AGS just before the entrance, then the AGS fire is shifted laterally, and the attacking group runs to the flank of our trench it is attacking after the shift of fire.

FROM THE AUTHOR. It is very similar to the somewhat modified standard infantry hasty attack battle drill of the Anglo-Saxon armies. Despite the fact that the width of the forest belt is small and the sight and fire distances are very short, flanking with frontal support is also attempted. But instead of using ground fire weapons (machine guns and hand grenades), as in the "classic" Anglo-Saxon combat algorithm, the frontal support uses mounted fire from AGSs. The flight of AGS rounds is not hindered by the trees of the forest belt, and the "air" bursts from colliding with branches directly above the attacked position only improve the defeat of soldiers sheltering in the trench.

4. The enemy uses a "checkerboard" for trench "whiskers" extending into the field beyond the forest belt. One trench "whisker" extending beyond the forest belt is on one side of the forest belt, the next one on the other side, but not in the same place as the first one, but with a sufficient displacement along the forest belt. The next trench is on the same side as the first, but it is also offset relative to the second trench.

5. There were cases of using a "rush" attack across a field. A tank and a BMP with infantry drove into the field in the approximate direction of an enemy trench blocking a wooded area across the field. The angle of movement of the vehicles to the trench was approximately 45 degrees, if the boundary of the forest belt in which the trench under attack was located was taken as the base of reference. The tank would stop about 300 meters from the enemy trench and fire on it. The BMP at about the same point was rushing the troop. The tank turned around and left. After that, the paratroopers ran for about 1.5-2 minutes to a patch of woodland located AFTER the attacked trench. During this time the enemy could not recover from the shock of our tank's direct fire on his trench, and he had to run to the forest clearing behind the attacked trench.

"missed" our fleeing soldiers. The trench was then stormed from the rear, using the effect of surprise.

6. Before attacking a forest belt, if the entrance to it is blocked by anti-personnel mines, tanks roll out the passageways with their tracks. As a rule, anti-tank mines are not placed inside the forest belts, as armored vehicles do not move inside the forest belts, so there was no fear of being blown up by anti-tank mines when rolling out the passageway.

7. The Ukrainian Armed Forces post live streams of their drone flights on Google Maps. That is, the flight images can be monitored not only by the operator and commander, but also by any soldier who has access to the Internet (via Starlink). This is done for better situational awareness of the soldiers.

8. At the beginning of the counteroffensive (June 4, 2023), the

scheme of action of the AFU was as follows: 1-2 days in advance, the troops were withdrawn to the initial area where they were given combat missions. On the day of the attack, they moved into company columns of 6-10 armored vehicles at a distance of 10 km from the front.

the edge of it. Then they continued to move in such columns. The movement was carried out in column until the lead vehicle was directly in front of the plantation under attack. Of course, when approaching the tree plantation, the lead vehicle would fire heavily at the tree plantation to suppress it. If the lead vehicle succeeded in reaching the tree plantation, the infantry would disembark and run into the plantation. In appearance, the infantry was not running in crowd, but in some organized pattern, which, however, could not be seen from the outside. The point of entry into the woodland could be either the gap between our strongpoints or some strongpoint in the forest belt. Apparently, this was determined by the route of approach, based on the mine danger. Our soldiers had the impression that the AFU had an order to continue moving forward in a column of armored vehicles after the front vehicle was hit by mines, bypassing the damaged vehicle.

The passages in the minefields were marked by the AFU with flags openly and in advance on the night before the counteroffensive.

9. Recently attacks by very small forces have become more frequent. For example, the AFU may try to attack a trench where there is a garrison of 6-8 men with two soldiers. In this case, the "creek" scheme is used. When the front two lie down, the next two try to bypass them. There can be up to five echelons of such doubles. It is important to emphasize: it is not a matter of one double covering another double while moving. It is simply a sequential change of attacking twos. Only one double is attacking at a time.

10. Our servicemen note that when the Ukrainian armed forces shell populated areas, houses catch fire much more often than when our artillery is shelling them.

11. The officer says that there are suggestions that the Ukrainian armed forces are using sound sensors. Sound sensors are being deployed, and if they hear our servicemen, cluster munitions will strike the area.

FROM THE COMPILER. It is possible that motion

sensors (seismic sensors) are used, but the interviewed officer spoke specifically about sound sensors.

Oychëy № 6 oy 30.09.2023

Recorded from the words of enlisted and officer personnel

1. When attacking trenches across an open field (to capture the outermost trench of a wooded area), infantry converge under cover of 120-mm mortars and 122-mm guns (D-30), followed by mortars. Initially, under the cover of 120 mm mortars and 122 mm guns, the infantry converge by running, but after reaching a distance of about 100 meters to the trenches of the defenders, the 82 mm mortars begin to fire instead of the larger calibers, and the attackers move to a crawling approach. In this way they come within about 20 meters of the attacked trenches. In this case, presumably, individual correction of the fire of each of the mines participating in the fire support can be applied to individual firing points of the defenders with the help of three to four UAVs observing the battlefield. Close maneuvering in the immediate vicinity of the defender's trenches can also be used during the final phase of the approach, namely, flanking the attacked trench in order to be in the rear of the attacked trench when the mortar support is terminated.

Attacks inside forested areas also involved approaching trenches under mortar fire to a distance of about 50 meters before the mortars moved their fire deep into the defense.

Soldiers have noted that in the absence of external signaling of the transfer of enemy mortar fire from a defended position (radio, firing of support weapons from withdrawn positions in a certain way, etc.), the risk of being trapped in dugouts by enemy infantry who have slipped into the trench is very high. When there is no scheme for countering an extremely close approach by the enemy under mortar cover (or if the personnel do not understand it), unstable units may be prone to withdrawal from positions.

FROM THE AUTHOR. As previously noted in paragraph 4 of Report No. 4, targets for defensive shooting may not appear earlier than a few dozen meters (20-50 m) before the defended trench. Shooting at distances of 100 meters or more may simply have no place. Here is another example of such a situation.

2. The following scheme was used by our troops to enter a rural settlement. Initially, a couple of tanks would move towards the village. The enemy began actively shelling these tanks, thus diverting the attention of the enemy's artillery adjusters. Taking advantage of this, four of our BMPs rolled into the village at full speed and landed the paratroopers. After the landing, the BMPs turned around and drove away. Then the tanks would withdraw.

3. When using the UAV in an area of relatively weak enemy REB signals, when the UAV is still able to transmit a signal to its UAV, but the UAV moves uncontrollably to the side, the following scheme of interaction with tanks firing from closed firing positions was used. After firing the tank for the duration of the tank shell's flight (14 seconds), the UAV's camera was directed downward to keep the at the desired point on the terrain pattern. A few seconds before the expected arrival of the projectile, the UAV camera was raised to observe the area of the expected arrival of the tank projectile. After transmitting the correction, the camera was lowered again to keep the UAV in place by monitoring the terrain pattern.

4. It was noted that the following scheme was used to organize the AFU's offensive operations. For the first 1-3 days there is no fire on the area of future operations at all, presumably so that our servicemen can begin to behave carelessly and give away their positions by their movements. Then 2-6 days of intensive shelling of this area with periodic attacks of separate small groups from different directions. As soon as one of the groups succeeds in gaining a foothold in one of our sections

defensive position in the forest belt, to this area begins to move reinforcements, to expand captured a "beachhead" in a wooded area.

5. During our offensive in the winter of 2022-2023, we used a scheme of movement of small columns of armored vehicles of 3-4 vehicles with the leading vehicle equipped with a tracked mine trawl. This did not solve the problem of movement through minefields, as the enemy periodically laid anti-tank mines in a "burger" pattern. That is, one mine was placed at a depth well below the zone of capture of the mine trawl, and another mine was placed above it. Even if the upper mine was blown out by the trawl, the tank would be blown up by the mine that was set more deeply. Difficulties were also caused by the fact that the rutting minesweeper only displaces anti-tank mines from the rut. Consequently, after the front vehicle has been detonated or otherwise disabled, the tanks following it cannot safely move off the track. The mines continue to lie on their sides. The column becomes blocked in the minefield. On the day of this offensive, none of the small armored columns were able to get through the strip of AFU minefields because of mine detonations.

6. Tankers note that infantry do not know the peculiarities of using tanks in combat. Tanks in the NWO often operate on the pattern of short trips: they move into position, fire a given number of rounds, and move to a shelter to reload. The movement of tanks backwards is often perceived by infantry that have not been trained as a signal for a general retreat/cancellation of the attack. As a result, the fire damage inflicted on the enemy by tank fire is not taken advantage of by the infantry. It is intuitively assumed that the tank should be physically close to the infantry.

7. It was noted that during the offensive the AFU does not use REB against our UAVs in order to allow Ukrainian UAVs to fly.

8. UAV operators note that, as a rule, the beginning of the enemy's REB operation against a guided UAV can be understood by the vehicle's behavior (image quality degradation, yawing).

If you catch this moment, you may be able to make an anti-REB maneuver.) If you catch this moment, you can make an anti-RAB maneuver in time. An example of such a maneuver is to move from an operational altitude of 200-300 meters to an altitude of 80 meters. If this does not work, the UAV can be lowered to 2 meters and brought to the desired area at this height. As a rule, lowering the UAV to a height of 2 meters ends the suppression of the enemy's REB signal.

FROM THE AUTHOR. When training UAV operators, it is desirable to show the trainees video recordings of the moments of the beginning of REB operation against UAVs.

It is standard practice to take the UAV into the sky a few hundred meters from the launch point after launching the vehicle at a low altitude of a few meters to avoid enemy detection of the operator's location. Tethering the UAV with fishing line during launch is not used.

10. When discussing the need for trench branches - whiskers extending into the open field - when establishing defensive positions blocking forested areas, a number of servicemen objected. Such branches, they said, are easily detected by UAVs. Being in these branches would, in their view, entail a high risk of being hit. These soldiers were in favor of mines in open areas outside forested areas. In practice, they detonated anti-personnel mines and threw them into the grass adjacent to a forest clearing. According to them, they managed to disrupt a night attack by the Ukrainian armed forces - one of the attackers blew himself up, after which heavy small arms fire was opened on the adjacent field.

11. It is noted that once the wounded are signaled over the radio network, the casualty evacuation route is heavily shelled by the enemy. In forested areas, this route is predictable and often the only one.

12. Use of small columns of 3-4 vehicles in the offensive by both

the AFU and our troops (at the beginning of the counteroffensive).

in June 2023, the AFU assembled convoys of 7-8 vehicles) military officials explain the lack of standard defensive positions. Positions in forest belts are very sparse. It is stated that the use of standard offensive densities is clearly excessive.

13. The normal tactic for using tanks in a rural settlement is to shell all potential enemy positions without entering the settlement. For such an engagement, a couple of tanks are normally used. Tanks do not enter the settlement.

14. Kamikaze drones may follow a vehicle leaving the front line for some time in the expectation that it will lead the operator to the location of a shelter, ammunition, fuel, etc. In addition to striking a detected vehicle, this is a way of identifying targets for subsequent strikes.

15. The withdrawal of vehicles and infantry to a safe distance from the bursts of their artillery shells ("pressing against the bursts of shells") is not used as a tactical technique. This is explained by the fact that it is possible to miss and, consequently, to hit one's own troops at distances much greater than the safe distances established by the regulations (200 m - tanks, 300 m - BMPs/APCs, 400 m - infantry at full height).

Oychëy № 7 oy 01.10.2023

Recorded from the words of enlisted personnel

1. When attacking enemy positions in forested areas, our troops used the "creeping in with distraction" attack scheme. The object of attack was a defensive position consisting of several arrow cells not connected by a single trench. It was located in a T-shaped intersection of two forest belts. The enemy cells were located in the "horizontal" forest belt on either side of the "vertical" forest belt adjacent to the "horizontal" forest belt. The "vertical" forest belt led from the positions of our troops to the enemy positions and was not physically occupied by the enemy, but had previously been chaotically mined. The sequence of actions during the attack was as follows:

1. first, a foursome of crawling soldiers ("crawlers") crawled the entire length of the "vertical forest belt" of 400 meters in about 40 minutes. The foursome moved in a conventionally unfolded line. When crawling, the ground in front of them was pierced with a knife to check for mines. If a mine was detected, it was moved aside with a small infantry shovel. The front four "crawlers" reached a crossroads of forest belts and lay low.
2. Following the foursome at a distance of 100-150 meters was a supporting group of 8 men. They were lined up in a conventionally staggered order in three rows.
3. After the four "crawlers" had reached the intersection of the two forest belts, machine-gun and mortar fire was opened on the enemy positions from the far edge of the field. Under the cover of this fire, the supporting group went to the rear of the advance four "crawlers", but did not catch up with them completely. It stopped about 30 meters behind the advance four.
4. After transferring mortar and machine gun fire from the far

edge of the field to the sides of the forest belt intersection in order to

In order to isolate the attacked positions from the supply of reserves, the supporting group engaged in a firefight across the forest with the enemy defensive positions. The supporting group would fire obliquely to the right and left from the

"The expectation was that the enemy would not notice the crawl of the forward foursquare towards their positions. The expectation was , having engaged in close small-arms combat with the supporting group, the enemy would not notice the crawl of the front four to their positions. And so it happened.

5. The foursome split into two twos. One crawled to the left, the other to the right. After reaching a distance of 5-10 meters the enemy trenches were pelted with grenades. The position was captured.

The attacking squad leader noted that it was necessary to practice crawling long distances of 200-300 meters.

He also pointed out that for the tactics of "crawlers", semirkas and twelve-cars are effective. In the case of a combat seven, three are the front line

"crawlers", four are the support group. In the case of a "two-nashka" combat unit, four are the forward "crawlers" and eight are the support group. The support group includes an RPG, two machine guns, and a sniper.

2. Soldiers have noted that approaching within 100 meters of a defended position virtually guarantees its capture. This is because when approaching closer than 100 meters, the attackers find themselves in an unshootable space for machine guns, which are the main defensive weapon. The slits in the baffle of the gun emplacements limit the sideways deployment of the weapons. A participant in the assault, who had combat experience in Syria, confirmed that this was the case there.

FROM THE AUTHOR. As previously stated in paragraph 4 of the report№ 4 and in paragraph 1 of

report No. 6, special attention should be paid to training for small arms combat from a defended trench at ultra-short ranges. It may be necessary to modify the traditional form of trench construction.

3. For clearing a trench, it has been pointed out that it is desirable to have one soldier outside the trench on each side of the trench. In this case, these soldiers move primarily by crawling.

4. The following tactic was used against tanks. About 10 meters in front of the tank, a soldier would suddenly run across the road in a jerk right in front of the vehicle and lay down. The instinctive reaction of the crew was to focus on this soldier: the tank turned its turret to fire on him. At that moment, two grenade launchers, one from the side and one from the front, fired two shots at range. In case the crew abandoned the tank, another pair of machine gunners were ready to open fire.

5. To camouflage the removal of minefields by thrown in "cats" can be used to fire VOGs. The explosion of a BOG is similar to the detonation of an anti-personnel mine. The systematic firing of POGs before and during the laying of a passage in a minefield can serve as a means of camouflaging demining operations.

6. When clearing the streets of a rural village, groups of 9 men advanced along the street. The advance continued until the groups were reduced to 4 men due to casualties.

7. The AFU on this section of the front is divided by the level of preparedness: blue scotch - poorly prepared infantry, green scotch - well-prepared and motivated infantry. Tactics depend on the level of preparedness.

8. The movement of hasty enemy infantry was noted in an extended formation with three columns: a central column, a column on the right and a column on the left. It may have been two successive wedges or rom-ba. A training notebook captured at the Ukrainian positions indicates the use of the following formations: 1) column; 2) staggered column ("serpentine"); 3) wedge; 4) expanded wedge; 5) battle line; 6) right or left ledge; 7) rhombus.

9. Currently, the AFU has abandoned the use of columns of armored vehicles. In fact, armored vehicles perform the function of "cabs". Infantry transported by armored vehicles is carried out at a distance of 2-3 km from the line of contact. Further

movement is carried out on foot. Often an accumulation pattern is used. At intervals of a few hours a couple of soldiers are dispatched to the forward positions. Two soldiers are not a target to justify the use of artillery, so they will usually manage to reach the wooded area where the accumulation takes place.

10. As a rule, attacks by AFU infantry in small groups are accompanied by 2-3 drones. They are supported by AGS fire and 60 mm mortars. This firepower is very difficult to detect from UAVs.

11. To counter UAV drops of grenades and HEATs, trenches are countered by piling a pile of branches on top of the trench. As a result, a grenade or HEAT is very likely to bounce outside the trench, making it extremely difficult to detect the trench.

12. UAV operators strongly recommend that machine guns and grenade launchers be placed in recesses in defensive positions, except when firing from them. They are very conspicuous when viewed from a UAV.

13. Before the start of the counteroffensive, the AFU sappers made passages in the minefields overnight and marked them with white flags made from improvised materials, or even laid white ropes along the edges of the made passage. These markings are easy to spot. The width of the passage for infantry was about 1-1.5 meters.

14. For shelter from thermal imaging, unzipped sleeping bags are used as a cape.

15. Attempts by our troops to make passages in the minefields by artillery fire were unsuccessful. The mines did not detonate. According to indirect information, the enemy tried to make passes in the minefields by firing from a tank right in front of the vehicle's nose, also without success.

There were cases when infantry were launched directly in front of an AFU tank and used their hands to remove anti-tank mines directly in front of the moving tank.

16. It is noted that servicemen often confuse whether a tank or artillery is firing at them. Normally, tank fire is defined as

by the very short time between the sound of the gunshot and the burst. However, this method is not reliable. The fact is that a gun firing from a distance can give the same picture. As long as the projectile is flying in an arc in the air, the sound travels in a straight line. Therefore, artillery can also give a short interval between the sound of the shot and the bursting of the shell.

17. The enemy's use of the scheme of moving armored vehicles to the attacked position in columns at the beginning of the counteroffensive in June 2023 was confirmed again. After the front vehicle was blown up by mines, the rest of the column would circle around it and continue forward. Presumably, this tactic was due to the fact that the enemy was confident in the mine resistance of the Western-made armored vehicles, and in particular, the loss of personnel during mine detonations was not expected. Accordingly, the enemy considered it possible to sacrifice vehicles in minefields in order to preserve the speed of the column's movement to our positions.

18. The pattern of the enemy attack at the beginning of the counteroffensive in two columns of armored vehicles was confirmed again. The positions of our troops were in forest belts arranged in the form of an inverted "P" with the "vertical" parts facing the enemy (in a general direction to the north). The initial position for the enemy was the 4th forest belt, which seemed to connect the bases of this inverted "P" so that a rectangle of forest belts was formed. The two armored columns of the enemy advanced in the middle of the field at some distance from each other. In front of them were tanks with trams. The armored vehicles that followed them were firing from the side at the forest belts surrounding the field. When the tanks with trawls reached the minefield, the armored vehicles turned in a line. At the same time the enemy infantry tried, under cover of fire from the armored vehicles, to make a rush across the field from the initial forest belt towards the "side" forest belts to the right and left of the field, moving somewhat obliquely, as if cutting corners. After the advanced tanks had been eliminated, the armored vehicle columns moved out onto

the field roads running along and in close proximity to the field.

from the forest belts. They are well-traveled and it is difficult to mine them without being seen. Then they tried to move along these roads, shelling the adjacent forest belt. This scheme was not successful, as both the leading tanks and armored vehicles were hit by our troops with ATGMs.

19. At the beginning of the Ukrainian counteroffensive, one of the options for building armored columns attacking the AFU was to include more than nine vehicles in a column, two of which were tanks. This scheme was later abandoned.

20. On 30.09.2023, in an interview with a UAV operator who corrects both tank fire from closed firing positions and artillery fire, it was confirmed that the order of correction can lead to confusion. The fact is that artillerymen are told the distance of the burst point from the target, e.g. "north 200". This means that the burst was observed 200 meters north (when firing from south to north) and was overflighted. Artillerymen are told to reduce the elevation of the gun barrel so that the next shell falls closer. Tanks, on the other hand, are told how much they need to raise or lower the barrel, not where the shell breaks. For example, "farther than 1", which would mean that there was a shortfall and they need to raise the barrel of the tank higher. In simplified terms, the expression "farther away" for artillery firing would mean overflight and the need to lower the barrel, and for tank corrections would mean underflight and the need to raise the barrel. When switching from one type of adjustment to another in the heat of battle, in stressful situations, adjusters have difficulties.

21. In the attack pattern captured at the Ukrainian positions, between the deployment boundary and the attack transition boundary is an alignment boundary.

Oychëy № 8 oy 02.10.2023

Recorded from the words of enlisted and officer personnel

1. When fighting in forested areas, there are difficulties in defensive combat due to the use of small-calibre mounted fire weapons by the enemy at the final stage of the attack, namely AGS and mortars. The transfer of fire of these weapons from the positions defended by our servicemen deep into the defense to bring the attacking enemy into close proximity to the trenches of our units is extremely difficult to detect. The enemy is in our trenches before our servicemen come out of their dugouts and under-bar recesses. Part of the difficulty is explained by the fact that the firing of Polish 60-mm mortars and foreign-made AGSs is not audible, and the approach of their ammunition is either not heard at all or is detected at the last second and a half before it arrives, and the sound is very faint. To mislead our soldiers the enemy, after the transfer of small caliber grenade and mortar fire deep into our defenses, starts throwing hand grenades in the direction of our positions, even if they cannot reach our trenches. The explosions of such grenades create the illusion that the grenade and mortar fire continues. Because of the absence of the sound of the shot and the ammunition's approach in foreign-made AGSs and Polish 60-mm mortars, it is extremely difficult to distinguish between the throwing of hand grenades and the continued firing of these types of weapons.

The absence of an audible "warning" of danger when firing these types of weapons has a negative effect in itself. Soldiers realize that they will have no warning when the fire resumes. Psychologically, this also makes it difficult to get out of cover to take up firing cells.

The soldiers themselves proposed the following solutions to the problem of late detection of the enemy's dash to our trenches by soldiers in the attacked trenches:

(a) The use of video surveillance cameras outside the positions themselves, so as not to be affected by shelling;

b) the use of UAVs conducting side-to-side surveillance outside the firing zone.

Ideally, on command from an outside observer, fire should start from out-of-position bullets (e.g. from neighboring wooded areas), sweeping the terrain directly in front of the trench under attack, as well as coming out of cover.

Soldiers are skeptical about the effectiveness of using designated observers (even in top-covered cells that protect against small caliber ammunition). They say that such an observer, fearing a headshot from ammunition exploding right in front of the observation embrasure, is likely to hide and not see the beginning of the enemy's dash for the trenches.

One of the officers said that there was a technique of counting down from each burst for twenty seconds and going out of cover into the trench to take up rifle cells after the count was over, with each new burst heard restarting the count.

The enemy, under cover of small caliber mounted weapons fire, can approach 50 meters to a trench defended by our troops in a wooded area.

2. An officer who had participated in the battles since the beginning of the NWO said that the largest offensive actions of our troops in which he had participated involved the use of about 15 tanks and 30 BMPs. The use of large groups of vehicles was abandoned for two reasons: a) the active use by the enemy of remote mining systems directly in the course, and b) the rapid concentration of artillery fire on armored vehicle concentrations.

3. Throwing 2-3 F-1 grenades under the bottom of the hull proved to be very effective against the MaxPro armored vehicle. The detonation of the grenades interrupted the hydraulic system and the vehicle froze in place. The driver could be heard trying to depress the gas pedal, but the vehicle would not move again. This information was confirmed twice.

The best RPG ammunition for engaging an immobilized APC was a thermobaric round. Shaped charge RPGs, RSGs, and 12-caliber (12.7) machine gun fire had little effect on the APC.

4. The following tactics are described when moving in forested areas in anticipation of an engagement with the enemy, when the location of enemy trenches in that forested area is unknown (movement to possible enemy contact).

The unit moves in a "snake", almost in a line, one at a time, without deployment. The "snake" is divided into three sub-units. A sentry subgroup consisting of 3 auto-matchers goes in front, followed by 2 sappers, then after about 30 meters (approximate range of visibility in the forest clearing) the main subgroup of 10-12 men (with an RSHG and, at least one PK machine gun), followed at a distance of 30-50 meters by a support subgroup of approximately the same size, but with more heavy small arms (in particular, 2 PKs), RSGs, etc., followed by a subgroup of approximately the same size, but with more heavy weapons (in particular, 2 PKs).п., carrying ammunition, water and food. The distance between soldiers in a squad is 4-5 meters.

The squad leader of the entire squad marches with the main group, usually third in order from the head of the main group, with another officer in that group who is responsible for the main group and interaction with the support group. He goes near the end of the main group so that there is interaction with the support group. The first officer in the main group is a sergeant (warrant officer). As a rule, an officer is also placed behind the entire squad to avoid soldiers getting lost after breaks or losing their way at forest belt crossings. An officer or a well-trained sergeant should also be assigned to manage the patrol and support group.

Ideally, the forward patrol sub-team should detect the enemy first and move back to the main sub-team without .

At the start of an engagement with the enemy (sudden or deliberate), the forward patrol and the main group separate and engage in frontal fire combat. The supporting group is used as a reserve.

Combat lasts three to five minutes. During this time it is either possible to gain fire superiority over the enemy, enter his trench and destroy him, or it is necessary to withdraw. The permissible short duration of the engagement is related to the reaction of the enemy's fire support. The enemy quickly begins to fire cluster munitions or AGS and 60-mm mortars at the terrain in front of his trench. He is not afraid of hitting his soldiers in the defended trench. The attackers need to escape the inevitable fire, either by capturing the enemy position or by moving back. The location of the attackers during a fire fight with the enemy in a trench in a wooded area is easily predictable to enemy artillery/ACS/60-mm mortar spotters.

As an example of the speed of movement, the above construction "In one case, it traveled 2 kilometers through the forest in a snake from 23.00 pm to 05.00 am.

5. Repeated use by the enemy of clearing firing sectors at the lower level, where leaves and branches are removed from plants in the firing sector up to half a meter from the ground, and vegetation above that is not touched. Enemy fire is directed at the lower extremities. The officer recommends that black boots be replaced by camouflage-colored shoes. Black shoes are clearly visible to the enemy.

6. The assault entry into urban-type settlements and rural communities was usually carried out as follows: a couple of tanks destroyed several houses on the outskirts of the settlement by firing from afar, then 2-3 BMPs dashed to the resulting ruins and landed the paratroopers in the ruins. Further movement was carried out by the infantry through the courtyards.

7. When operating in urban settlements, the impact of an RSG explosion on enemy positions was insufficient, while Bumblebees proved to be good. When operating in populated areas, F-1 hand grenades are predominantly carried, and in forested areas - RGD-5. In forested areas, the use of RSGs, as well as RPG-18s, is recognized as effective.

8. It has been noted that the enemy has completely blocked off remote firing cells, not only the position where the soldier is located, but also the section of the trench to which the cell adjoins. A UAV drop that hits near the entrance to the covered area does not hit the enemy in the cell, as it is around the corner in the cell itself. A "fox hole" is dug in the steepness of the trench opposite the cell to store ammunition and equipment.

10. On the first day of the Ukrainian counteroffensive, the following use of AFU armored vehicles was observed. The vehicles drove up to our trenches and described circles in front of them with a radius of about 150 meters (according to other reports, "figure eights"). At this time they were firing continuously at the forest belt where our trenches were located. The continuous machine-gun fire probably played against the crews of the AFU armored vehicles at a certain stage of the battle. Subsequently, many AFU vehicles that had been hit were found with unloaded machine guns.

11. The soldiers who observed attacks by columns of AFU armored vehicles (up to 6-8 vehicles per column) on the first day of the Ukrainian counteroffensive on June 04, 2023, had the impression that the attackers were counting on psychological influence. There was no artillery preparation prior to the departure of the AFU armored vehicles in the area where the interviewed soldiers were located.

12. It is noted that UAVs do not fly in the rain.

13. The use of pressing against trees (without putting the arms out to the sides) to counter UAV thermal imaging surveillance was mentioned again.

14. Servicemen are concerned that the use of bourgeois stoves will lead to the demasking of our troops' positions in winter because of the use of UAVs with heat-seeking devices. It is proposed to use household gas heaters for dugouts.

15. It is noted that due to remote mines, evacuation points where vehicles can reach are being forced to move further and further away from the front line.

16. When conducting surveillance with a UAV, it is better to have two vehicles. When the battery of the first one is running low, the second vehicle should be raised first before the first one is lowered. Battery swap landings with one UAV are used by the enemy for covert movements such as stealthy buildups.

17. In forested areas, it is better to choose a position under a tree, so that when the UAV drops it, there is a better chance that the dropped munition will collide with branches and bounce aside.

18. It has been noted that one of the reasons for delays in the response of artillery and mortars to calls for fire support is the delegation of the approval of ammunition consumption to higher commanders. The senior commander uses the mechanism of having to pass the call for fire request through himself as a way of controlling ammunition consumption. Soldiers have suggested that they could be allocated duty firepower (with a set ammunition limit) that could be called directly, without involving the senior commander in the fire support request process.

17. The servicemen noted the enemy's use of the following combination of UAVs: 2 observer UAVs hovered at different edges of the field, and 6 UAVs "carouseled" and dropped grenades on our soldiers in succession. These actions were carried out simultaneously with the infantry attack.

18. It was noted that when fighting broke out in a forest clearing between attacking units and the enemy defending in trenches, the attackers' communications at the point of engagement suppressed by the defender's electronic warfare equipment. The soldiers could hear the conversations of other subscribers on the network but could not transmit anything. When moving away from the point of engagement, communication was re-established, i.e. a point effect of the defenders' REB on the area immediately in front of the defended trench.

19. The prisoners show the use of methadone by the AFU to increase the efficiency of soldiers from the entrenching groups when digging trenches and constructing dugouts.

Oychëy № 9 oy 07.10.2023

This is from the words of the bomb squad officers.

1. When the enemy fired cluster munitions at our trenches in the forest belt, the anti-personnel minefield, the near edge of which was located about 10 meters from the edge of the forest belt, was completely destroyed. The deminers assumed that the density of the submunitions provided a close burst to each mine. They also hypothesized that for this reason cluster munitions could destroy anti-tank minefields. They confirm that the firing of fragmentation projectiles does not significantly change the minefield density, i.e. it is not the explosive power that is important for minefield destruction, but the frequency with which the explosions cover the bombarded surface.

a) If the above explanation is correct, it is possible that firing a number of AGSs into a section of minefield could be used to make passageways when this needs to be done quickly. b) It may be more practical than using long demining charges. The deminers explained that the detonation of the "Horned Serpent" detonates only those anti-tank mines that are in close proximity to the fall of the explosive hose. Mines a little farther away simply scatter to the sides. Sometimes their fuses are blown off. A passage made in a minefield in this way may contain unexploded mines and must be checked for vehicle movement, otherwise a vehicle may explode in the middle of the passage and block movement. A cleared passage is guaranteed to be sufficient for infantry only

on foot. Firing cluster munitions or multiple AGSs into a minefield would potentially not pose such a problem.

The above explanation needs to be verified. In some cases, when a bullet hits a mine, it does not detonate. The mechanism by which cluster munitions "clear" minefields has not been fully confirmed.

2. At the beginning of the Ukrainian counteroffensive on June 4, 2023, the enemy tried to use the strip between the near edge of the minefield to our positions and the forest belt where the defensive positions were located (about 100 m). Several vehicles drove into this strip through a passage in the minefield and then spread out to throw infantry into our positions using this strip.

Subsequently, our troops began to lay transverse mine lanes, which created T-shaped intersections with established minefields. Movement in the adjacent 100-meter strip held by our troops by vehicles became impossible.

3. To bypass the minefields from the side, the enemy used tanks to enter the forest belt and move inside it, since anti-tank mines were not, as a rule, installed in the dense vegetation of the forest belt.

4. There is an example of two soldiers who, in about 2 days, built a pair of shelters with a cushion of soil about 4 meters to the ceiling of the shelter and about 5.5 meters to the floor of the shelter. The soil was not crumbling (it consisted of about 40-50 cm of chernozem and then clay). The position was in use for about one month. Initially, the shelter was prepared without wood cladding. The shape of the shelter was a U-shaped excavation under the bottom of the trench. Both exits from the shelter led out of the trench to the bottom of the trench. In order to pass through the trench, it was necessary to descend down to the bottom of the trench and then ascend to the top. The descent and ascent were

were steps made in the ground. The steepness of such a "staircase" was about 45 degrees. At the lowest point of the dig, there was a short underground corridor leading away from the enemy, long enough to accommodate along the corridor two earthen sleeping places covered with standard tourist mats - "foam". In the middle between the sleeping places, which were equipped as earthen shelves, there was a place where one's feet would go down when sitting on the sleeping place (earthen shelf).

FROM THE AUTHOR. This example suggests that the physical qualities of the soils in the area technically permit the construction of deep-covered positions along the lines of the "fox holes" of World War I, which were up to 8 meters deep. The said protective thickness neutralized the impact of almost all but the largest calibers of artillery.

5. The enemy's use of the minefield passage scheme at the beginning of the counteroffensive was repeatedly noted, based on the fact that after the front vehicle of the column was blown up, the following vehicles simply drove around the front vehicle that had been blown up and drove on. The engineers assumed that the calculation was that the minefield would not be deeper than 3-4 rows and that if not the second, then the third vehicle would pass through the minefield, followed by all other armored vehicles in the column. At the same time, the armored capsule of the armored vehicles will allow the crews of the blown-up vehicles to survive. After the AFU counter-attack, our sappers began to reduce the spacing of the mines, thereby increasing the number of mines in the minefield and the likelihood of blowing up more AFU vehicles.

6. RPG-7s are used to remotely throw POM-type mines.

7. The German DM1399 mines (emplaced with AT2 cassette shells, which are designed for the German MARS II MLRS), which have 4 types of fuzes, are removed by initiation.

The magnetic field simulates the presence of a mine under the bottom of an armored vehicle, and the mine is detonated prematurely. The magnetic field simulates the presence of a mine under the underbody of the armored vehicle and the mine is detonated prematurely.

8. Standard mine trawls can usually withstand 2 mine detonations, which is less than the 4-5 detonations stated in the data sheet.

9. Given the weight of anti-tank mines, a person cannot carry more than 4 at a time (6 mines at the limit). After all the mines that have been brought in have been laid, a soldier is left at the edge of the laid part of the minefield to mark its temporary boundary. All mine-layers then follow the next batch along a path outside the minefield. Although this is only done at night, it does not create any micro-orientation problems and no orientation aids are needed. It is always possible to orient oneself in relation to the trees in the forest belts.

10. It was noted that enemy sappers rolled up their sleeves to probe the surface of the minefield so that the inner sensitive side of the forearm could feel the stretch marks.

FROM THE COMPILER. This is a standard training element in NATO armies.

11. The deminers noted that the dark time of day is always sufficient to make a passage in a minefield with a margin of safety.

This is from a bomb squad officer.

1. The enemy and our troops are conducting offensive actions inside and along the forest belts. One of the reasons for the possibility of such actions is the absence in some cases of minefields blocking forest belts. Their absence is often due to everyday reasons. Infantry unit commanders ask sappers not to lay mines in forest belts, but to give them up, promising to lay them themselves later. However, the mines are not installed later. The reason for this is that for infantry units, the forest belts are a place of residence, and installing minefields would limit their usability for domestic purposes.

The most rational ways of laying minefields in forest belts differ from the ways of laying them in open forests. Mine sites are anchored to paths and open spaces where the undergrowth does not interfere with movement. Such an installation reduces the predictability of the minefield boundary, making it less linear and, consequently, making it more difficult for troops to orient themselves with respect to the configuration of the forest belt's domestic zone.

2. The minefields laid by the enemy in our rear by remote mine-laying devices are technically relatively quick to remove, since the mines are quite simply laid on the ground, and subsequently such mines are either detonated with overhead charges or shot with large-caliber machine guns or sniper rifles. The main reason for the effectiveness of such minefields is organizational. A report on the installation of remotely placed minefields is not given to the deminer until a piece of equipment has detonated in such a minefield. Only then is the demining unit, which has yet to reach the site, called in and the work of digging begins.

the passageways in them. Usually the number of mines that need to be removed to restore the mobility of our troops by making a passage is small. An example was given of five mines on a road had been remotely mined. Sapler emphasized that if the signs of detonation of remotely-delivered mine carriers were communicated to all personnel before they were dispersed, perhaps the reaction time to their use by the enemy could be shortened.

The deminers emphasized that shooting mines does not always result in a guaranteed detonation.

3. Given the enemy's use of thermal imagers, engineers try to conduct minefield emplacement operations in the morning or evening twilight. During this period it is difficult to observe with daytime devices, including UAVs, and thermal imagers are hampered by the heated surface of the field. Usually the period of operation about 30-40 minutes. Because of this limitation, a minefield of three rows, about 1 km long, of 750 mines, with a mine spacing of 5 meters, takes 2-3 days to lay.

4. Mines are usually stacked in forest lanes prior to emplacement. In order to reduce the time taken to bring them to the place of emplacement, the movement of the bringing parties is used obliquely across the field where the mines are to be emplaced, rather than strictly to the beginning of the minefield, and then along a path along the minefield to be laid. Instead of moving "along the cathetes", one moves "along the hypothesis". In order not to lose the edge of an already laid part of the minefield, darkened flashlights are used. Usually a red light is used and the lamp is covered with tape to reduce the brightness of the light. The lanterns are mounted on pre-prepared stands, which must be above the level of the grass. The height of the stands can be up to 2 meters.

5. When using roller trawls, it must be borne in mind that detonating a mine under the trawl has a strong negative effect on the driver. After one or two detonations, the driver mechanics may refuse to continue driving through the minefield, even if they are injured or bruised.

In addition, after several detonations, the trawl becomes very difficult to move the tank on which it is mounted. The maneuverability of the vehicle is severely reduced. Rolling trawls can only really be used to detect the leading edge of a minefield.

6. Modified POM mines (self-destruct device removed) are thrown with RPGs in the direction of enemy defensive positions to make it difficult to move through the forest belts where such positions are located. Usually two grenade launchers are used, each of which fires two shots, after which one must take cover to avoid being hit by return fire. After a while, the throwing is repeated.

7. As a rule, EOD units do not install non-retrievable mines, as fields often have to be removed and reinstalled in new locations. EOD is often used by units of mobilized soldiers, which then complicates the work of the EOD units.

8. When armored vehicles are detonated, there are cases where the following combat-ready tank pushes the detonated vehicle in front of it as a demining device.

9. Grass burning is only effective against "stretch marks". Even melted anti-personnel mines remain functional.

10. The enemy sends all those who refuse to participate in assault operations to the entrenchment teams, which first dig trenches. By separating the functions of the assault and entrenchment teams, a high rate of equipment is achieved.

11. It is noted that enemy tanks can use the following sequence of actions: they start up to fire a shot and immediately after the shot is fired, they are silenced.

12. In conditions of soft soils on the southern section of the front, the use of blade mine trawls is convenient.

13. For ditching by explosive method, defective artillery ammunition is used, which accumulates in relatively large quantities. Pits approximately 1.5 meters deep (1 bucket) are dug with an excavator bucket for rapid ditching

5 meters apart and stack 5 shells in each. A further simultaneous detonation forms an anti-tank moat.

14. To ensure the safety of the deminers when laying minefields in the front line and to prevent fire on their own units, the demining units provide thermal imaging equipment to the infantry units so that an infantry observer can monitor the deminers' activities from the trenches at all times. The infantry observer is told how many heat signatures he (the deminer) is to observe.

15. The UR-83P demining units are attached to civilian trailers for transportation to the battlefield.

16. One of the ways of arranging places for personnel to live is to cover the top of the trench section with wood planking and to cover the entrances to the trench with cloak tents. The soldiers dig "fox holes" in the steepness of the trench, below the level of black soil (1-1, 5 m). Then there are clays, which hold the walls of the "fox holes" well. Such a "tunnel" is heated with household kerosene stoves without pipes.

17. Instead of signal mines, hand grenade fuses used separately from the grenades themselves are used.

18. The enemy has been noted to be "kamikaze drones". That is, the drone flies to our rear in advance, sits in some shelter, and waits. After receiving a command from the observer drone, it rises and strikes. In this way, the enemy reduces the reaction time to the appearance of targets in our rear.

A separate serviceman on 08/10/2023 told the following:

19. In early January 2023 (FPV drones were not used en masse, drop drones were used), the counter-drone defense of a rural settlement was organized as follows. The village had a roughly rectangular shape. Observation posts were set up at the corners and in the middle of each side of the rectangular border of the settlement. Two men were constantly working there. The total composition of the post was 8 men. The twos would change from time to time. Drones

The drone was usually detected by sound. The drone's approach and direction of approach relative to the observation posts was then signaled by radio. Anyone who heard the radio message would join in the small arms fire on the drone. In practice, the drone was fired at from at least four sides. To increase the probability of hits, fully loaded magazines, ideally with 45 rounds of RPK tracer bullets, were used. Drones were shot down at an altitude of about 20-30 meters at the same horizontal range. Initially, the enemy tried to discourage this practice with increased mortar fire, but was unsuccessful. After about one and a half to two weeks, drones began to fly around the village on the side of the edge of the forest belts that framed the fields surrounding the village.

20. In the late fall of 2022 (the grass was already dry and there was no snow), a sniper or observer of the AFU was seen crawling towards our positions. During the first night he crawled about 900 meters. During the day he did not move. He resumed his movement the next night. He was destroyed by AGS fire.

Oychëy № 11 oy 13.10.2023

Taken from the words of an officer who has used UAVs in combat operations

1. Enemy UAVs use the tactic of "mirroring" our reconnaissance UAVs to cross the front line. When they detect the flight of our reconnaissance UAVs, they send their UAV of the same class to the front line at approximately the same altitude and at approximately the same speed. When our air defense tries to find out if our UAV is flying in about such and such an area, our UAV service confirms that there is our UAV in that area. The enemy UAV crosses the front line. They do not fire at it, believing that it is our UAV. Later, after the enemy UAV moves deeper into our rear, the enemy shoots down our UAV.

2. To determine the launch range of a kamikaze drone, you can measure the battery's state of charge while its battery is stored after a hit. If you know the characteristics of the drone, you can determine the approximate distance the drone traveled before it was hit by the battery. Measurements should be made as soon as possible after the UAV battery is detected, as the battery gradually discharges. Such measurements are especially useful when there is a possibility of launching drones by enemy DRGs from the rear area of our troops.

3. The enemy uses pickup trucks that carry reconnaissance drones, repeater drones and kamikaze drones, as well as the necessary equipment to launch and maintain them. A team of two to three people in a pickup truck performs the entire mission cycle from detecting to engaging targets and quickly changes locations.

4. If the enemy turns on the REB, it is an indication that they themselves are not using UAVs.

5. It is necessary to limit requests for the location of groups, as such information can be intercepted and used by the enemy to destroy these groups.

Suggestions from an officer:

6. It is proposed to use kamikaze drones with a transponder, which could bring their range to 8-10 kilometers. This would make it possible to eliminate some of the tasks currently being accomplished with high-precision Krasnopol-type projectiles.

7. At the idea level, a proposal was made to use five kamikaze drones tied to one control panel as a means of precision destruction of enemy defensive positions. In this case, only one drone is controlled by the operator, while the others receive commands from him and fly roughly parallel to him.

8. The system for writing off UAVs lost in combat is very cumbersome. It is time-consuming for the few available specialists who are distracted from their combat work. A simplified write-off procedure is desirable for the duration of the EOD.

Oychëy № 12 oy 01.11.2023

This is from the officer's account

1. Minimization of approaches to their defensive positions is used, with mines placed not only in front of the trench, but also behind and to the sides ("encircling" mines). An attacking unit that has captured a trench is "trapped" by mines inside the trench. Because of the mines, it cannot spread out across the le- sopolopolis in which the trench is located or continue to advance deep into the enemy defenses. Once the attackers occupy such a trench, it is subjected to intense enemy fire from deep inside the defense. The enemy opens fire on its trenches, including when AFU soldiers are still in them. In the forward positions prepared by the enemy as "fire traps" for our units, the AFU garrison often consists of poorly trained and poorly motivated soldiers. As a rule, there are no heavy or valuable weapons in the forward trenches, or they are pulled away by enemy in a timely manner as our units advance.

2. Small group operations, which now emphasized, often provide inadequate reinforcement and fire cover for the attacking unit. As a result, there is no opportunity to build on the initial success at our point of impact.

3. A heavy UAV of the Baba Yagi type is used in conjunction with two light UAVs. The first light UAV conducts reconnaissance and target designation. It flies in front of the main group. The Baba Yaga follows, loaded to drop on identified targets, accompanied by the second light UAV, which corrects it as necessary. Baba Yaga's optics are usually relatively weak, and she can see well below her and within a radius of 100-150 meters. "Baba Yaga is already approaching a specific place to drop ammunition without wasting time searching for the target. The sorties are made mainly at night.

Oychëy № 13 oy 11.11.2023

Compiled from communications with senior officers of an
artillery unit

1. There were cases when our attacking infantry came within 100 meters of the bursting shells of our artillery and crawled up to 50 meters before the bursting shells. They considered the 400-meter safe distance limit specified in the regulations for full-size infantry to be a reinsurance.

2. The gap between artillery fire on enemy positions and the attack of infantry units can be up to two hours. The need to immediately utilize the results of fire attacks is often not understood. The postponement of an attack by infantry units may be for administrative reasons unrelated to the tactical requirements of the situation.

3. During the entire time of the Strategic Air Defense Forces, artillery reconnaissance assets did not observe the use by the enemy of tank groups of more than two and BMP groups of more than three at the same time in one place.

4. The method of sequential concentration of fire was planned and used only once during the entire time of the NWO by this artillery unit. Its use proved to be very effective. However, there were no further requests for its planning and use.

5. Infantry units often refuse to use artillery correctors on the grounds that they will correct the artillery themselves. One of the reasons for this refusal, according to respondents, is the possibility of incorrect data being transmitted about what is happening on the battlefield. The artillery adjuster, being independent of the infantry unit command, will provide information necessary for artillery fire that may not be what the infantry unit commanders want.

FROM THE AUTHOR. A similar situation has been included in previous reports regarding the interaction of infantry units with demining units. Infantry units refuse to lay mines by EOD units, arguing that they will lay them themselves. As a result, mines are not laid because they interfere with the administrative and economic use of the area.

6. The command and observation posts of company and battalion commanders have actually been turned into command and control posts. The commanders at this level are located in places do not allow for direct observation of the battlefield. The possibility of observing on a monitor screen the video stream transmitted from UAVs does not compensate for the possibility of personal observation of the battlefield. As a result, there are instances of loss of control.

7. The use of UAVs, which allow observation of the battlefield from depth, leads in some cases to micromanagement by senior commanders. Commanders at the Army level and above are involved in platoon-level battle management (targeting individual low-value targets). This leads in some cases to erroneous prioritization of targets and artillery resources allocated to engage those targets.

FROM THE AUTHOR. The U.S. Army had a similar problem in Vietnam. The widespread use of light helicopters and portable radios, as well as weak enemy air defenses, allowed senior commanders to hover in helicopters over the battlefield and control the combat of various departments. This practice was eventually abandoned because the transfer of lower-level command and control tasks to the upper level impeded success in combat. This problem later became one of the reasons for the U.S. Army to adopt the open command system (mission command).

8. Due to the transfer of a significant portion of instrumental reconnaissance equipment to special operations forces, the quality of task performance by artillery units has deteriorated. There are cases where the use of individual targeting means (including Lancet-type kamikaze UAVs) is not linked into a unified fire plan. There are also some instances of the use of reconnaissance tools, such as the Irony system, to perform tasks at a lower tactical level than the level at which they can be used given their tactical and technical characteristics.

9. An artillery unit may not concentrate more than three guns on a single target because the frontage prescribed for the artillery unit in question is too extended. Batteries (with few exceptions) do not fire.

10. Due to the enemy's transfer of the counter-battery function to unmanned vehicles, the enemy has moved its guns to maximum distances from the front line and is firing only at the leading edge. As a result, our artillery systems cannot effectively engage the enemy during counter-battery operations.

11. There are isolated instances where, after the enemy has destroyed one or two armored vehicles, the attacking sub-units refuse to continue the attack and retreat to their original positions.

Oychëy № 14 oy 13.11.2023

Compiled from the words of servicemen and officers

1. To reduce the time to call in supporting fire BEFORE the infantry attack begins, the adjusters of attacking infantry units are allocated firepower and ammunition limits which they can call in directly during the battle, bypassing the pyramid of control. That is, the fire adjuster communicates in advance of the battle preparation with the commander of the supporting gun or battery, whose fire he can call directly as part of the planned battle. Soldiers believe that the right to call in artillery fire should preferably be established at least at the level of the commander of a motorized rifle company.

FROM THE ORIGINATOR. As previously noted in discussions with soldiers, the transfer of requests through the pyramid of command is largely due to the need to control ammunition consumption and avoid spending it on unimportant purposes. In the approach outlined in this paragraph, the pyramid of command is only used during combat to submit

The "over-limit" requests for opening fire. Some fire tasks are accomplished directly on call from forward artillery observers or attacking unit commanders.

2. The artillery usually takes its UAV into the air after receiving a report that infantry units have located a target in order to adjust fire. The infantry units can often only give an approximate location of the target and are not able to correct artillery fire properly. Unfortunately, the time it takes for the UAVs of artillery units to enter the maneuver zone designated by the infantry is very short.

In the event of a fire mission, it is possible for the enemy's roaming tanks to complete the fire mission and escape.

FROM THE . In the past, artillery chiefs have noted instances of clearly inappropriate requests from infantry units, causing artillery units to distrust requests and, consequently, to try to double-check them in-house.

3. A long request shoulder for air defense assets to operate through the control pi- ramid results in ineffective air defense assets against enemy UAVs. Air defense assets are usually kept off to avoid detection by the enemy. They are turned on only after observers report an enemy UAV overflight. If there are multiple control legs, a significant amount of time is lost in transmitting the request, during which time the UAVs fly out of air defense range.

Infantry soldiers believe that the right to report UAV overflights directly to an air defense unit would be desirable, at least at the level of the motorized rifle company commander.

4. To encourage officers to be diligent in organizing the battle, temporary assignment of failed officers to forward units to command on the ground in the front lines is used in the event of failure to accomplish a task that is clearly due to inadequate training and battle management.

5. In order to camouflage artillery positions, ammunition may not be transported by truck directly to the positions, as the ruts in the ground become clearly visible after several such transports. Where the ruts are broken, a gun is likely to be located, allowing the enemy to identify and destroy the gun. The nearest depot to which the tracks approach (i.e. to which delivery is made by truck) is at least 500 meters from the gun positions. Transfer from this closest depot to the firing position is accomplished either by hand carry or by using the

wheelbarrows/motoblocks. A crew of 4 men carrying shells all the time is sufficient to power the gun.

6. To avoid ammunition losses, a system of small depots approaching gun positions is used, the farthest of which is up to 20 kilometers away and the closest 500 meters away.

7. Infantry soldiers consider the gun moving out of cover to fire to be less effective than camouflaged firing positions from which fire is directed after the camouflage has been cast aside. In the former case, it takes about 15 minutes from the time the command is received to the time of opening fire. During this time, the target may move.

8. In the course of attacking operations, experience has shown that when infantry units stand in place the combined casualties are higher than during assaults. Staying stationary in one place for more than one day leads to the enemy discovering the location of positions and opening effective fire. It is recommended to either move with a constant "gnawing" of the enemy's front or withdraw.

FROM THE AUTHOR. It is possible that in the future, "plateau" contact with constant back-and-forth movement will replace trench-based defenses.

9. Trench visors are quite effective against drop drones and kamikaze drones.

10. During attacks, it has been found effective to switch from 122-mm guns and 120-mm mortars to AGS and SPG fire. During the former, the AGS and LNG fire allows for a 300-meter approach to the enemy positions, while the AGS and LNG fire allows for a 50-meter approach to the enemy trenches. After the AGS and LNG fire is transferred to the sides and deep into the enemy's defense, the infantry makes a dash to jump into the attacked trench. The transition from 122mm/120mm fire to AGS/SPG fire is done in overlap. That is, the fire of the second

is opened in the last minutes of the first rounds of fire. The AGS/SPGs are fired either before the 122mm/120mm rounds are fired or in pauses during the rounds. The effectiveness of AGS fire is particularly emphasized, as it produces high-density fire.

In this scheme, the dash to the enemy trench was usually accomplished by four soldiers, two of whom, at the end of the dash, would enter the trench for further clearing from the inside, while the other two would cover the first two on top of the barrier. The second two may either move along the barrier or support from a stationary position next to the trench being cleared.

Increased effort is achieved by another foursome, which follows about 50 meters behind the first foursome.

A diversionary group may be used in attacks.

11. Given that the enemy opens fire almost every time trench is cleared, it is important to leave the trench and spread out after clearing it. From experience, a 50-meter withdrawal to the side of the trench is sufficient in most cases.

12. It is stated that in most cases infantry fire is indirect fire, which in most combat situations is sufficient to stop an enemy advance or squeeze him out of a defended position.

13. The "carousel" tactic of drones with drops (rapid replacement of one drone with another in the same barrage zone and dropping ammunition) has been almost completely replaced by the "carousel" of reconnaissance UAVs. These UAVs detect a target, and the operator calls in an FPV drone to engage it. When using FPV drones, the emphasis is more on surprise and massive strike (including by landing 3-4 drones in standby mode deep inside our defenses and near our positions) rather than constantly barreling over a potential strike site.

The enemy's echeloning of UAVs was also noted: UAV drones operate along the leading edge and Baba Yaga-type UAVs in the depths of our defenses.

14. A common fishing net is used to protect trenches from FPV drones, in which drones become entangled. To protect against

A rigid netting or canopies made of hand-held materials are required for UAV drops.

15. We note the enemy's use of the following scheme to attack our position in the forest belt. Initially, two tanks and two BMPs drive in a column along the forest belt. About 500 meters before reaching our position, the first tank drives off to the side into an open field between the wooded areas (approximately in the middle of it) and fires at an angle at our position. When the second tank and the BMP approach to a distance of about 100 meters, the second tank turns aside to take up a position to fire at an angle at the attacked trench. The BMP continues straight ahead, firing as it goes. The first tank turns around and moves to the rear approximately along its tracks. The second tank also turns around and moves to the rear, as does the first, before the BMP arrives in close proximity to the trenches under attack. The infantry is then rushed in and clears the attacked trench.

16. To detect the front edge of a minefield, instead of tanks with trawls, they use dogs that land when they smell mines.

17. Large caliber weapons are used to camouflage mortar fire. In this case, the large caliber guns firing are at a great distance out of range of the counter-battery weapons, but do not fire accurately due to high dispersion, while the mortars fire accurately because they are close to the fired positions. Often the firing directions of large caliber guns and mortars are at significant angles to each other.

Duplex firing is also used to make positions more difficult to locate by firing two mortars at long distances from each other at the same time.

18. The use of camera traps paired with machine guns that are aimed at the area where the camera trap is operating has been noted.

19. Attempts by the enemy to clear mines by prolonged shelling of certain areas of terrain with all types of artillery, including cluster munitions and MLRSs.

20. To counter enemy armoured vehicles that had penetrated deep into our defences, mobile tank destroyer teams (MGITs) on pickup trucks were used. MGITs are armed with ATGMs and RPGs. The number of MGITs is usually up to nine men.

21. The enemy frequently uses the tactic of dropping infantry paratroopers into the rear of our forward positions. For example, during the shelling of our defensive positions in a forest belt, the enemy rushes a BBM past and parallel to this forest belt deep into our defenses, where he lands a paratrooper. The paratroopers move to the defense. attempt is made to attack our forward positions either from the front or from the newly captured positions. The success of this entrenchment depends on whose artillery is more effective in shelling each other's positions.

Another method is to skip through rural settlements (usually along a main street) at high speed with several TBMs. During the skip, the supporting tanks fire tank guns on the sides of the road being traveled.

22. At the beginning of the Ukrainian counteroffensive the enemy tried to use columns of 15-20 armored vehicles. Apparently, the intention was to streamline the defense nodes, because immediately after the columns were fired on by our troops, they would turn and try to pass in another place. This method of attack did not work and was abandoned.

23. It was once again confirmed that at present there is no open-field attack by either side. The attack is always conducted through wooded areas in small groups of 12-15 men. Soldiers note that even when small groups are used, it is necessary to attack simultaneously in many areas with a broad front. The sequential introduction of small groups is undesirable, as the enemy is able to concentrate fire from his available firepower on the forward attacking units.

24. U-shaped minefields are placed around the forest belts defended by our troops to avoid driving in

enemy armored vehicles inside forest belts, in particular for driving around minefields in forest belts.

25. T-80 tanks with gas turbine engines can move out relatively quietly when traveling at low speeds, which allows them to be used for surprise direct-fire missions, especially at night. Tanks with diesel engines are more likely to be used for firing from closed firing positions, as they are noisier.

26. When tanks are used in short-term fire missions, an average of one "night" tank and one "day" tank is used per motorized rifle company. In this case, 3-4 vehicles may be kept in the waiting area to cope with unforeseen developments.

27. At the beginning of the Ukrainian counteroffensive the enemy attempted to attack without artillery preparation in the expectation of surprise. This tactic generally failed to justify itself. Subsequently, the enemy switched to artillery preparation of the attack.

1. To prevent UAV drops, wooden shields prepared in advance in the rear are used to cover trenches from above. There is controversy over their use. Their disadvantage is that when artillery strikes, debris from the shields blocks the passage through the trench, especially since nails stick out of the broken shields in all directions. It also reduces the number of points from which grenades can be thrown when the enemy approaches, which, among other things, increases the relative numerical superiority of the attackers. There were reports of units refusing to install them. Soldiers suggested that a roughly equal ratio between covered and uncovered trench sections would be most appropriate. However, the practice is to cover the trenches completely with shields, creating relatively long "tunnels," with about in three firing cells open. Given the average of three firing positions per soldier, two positions are covered with shields and one is open.

It was noted that the presence of shielded areas changed the tactics of fighting in a trench, because when the assaulting infantry entered the "tunnel" covered by shields, it was possible to run across the surface and block a part of the assault group in this "tunnel".

From the point of view of the original task, protection against UAV drops, shielding is quite effective, primarily because the enemy cannot see where the drop is being made. Shields help against grenade and VOG drops, but recently there has been a trend toward increasing the weight of the dropped munitions. Shields are switching from VOGs and grenades to grenade launchers. So far, the effectiveness of shields against them

is incomprehensible. Even a camouflage net could help against light drops - grenades and HE grenades slid away from the trench; nets do not help against heavy drops.

It is also noted that it is extremely difficult to bring pre-prepared shields to the front trenches, so shields are mostly used in the second and subsequent lines of trenches.

2. It has been cautiously suggested that the practice of joining a single trench of trenches may not be advisable in view of the transition of the opposing sides to the tactics of small infantry groups and the virtual abandonment of tank attacks. Once an assault team has entered a trench, it is often able to clear the entire trench, however long it may be. If the assault team needs to surface, it may be more advantageous to the defense.

3. There has been widespread use of UAVs for individual resistance of soldiers in assault teams, in particular for grenade fighting in trenches. The UAV operator corrects grenade throwing even when the soldier in the trench cannot see the enemy (direction and range). The operator can provide guidance on simple tactical combinations, such as one soldier leaving the trench and distracting the enemy with fire from one side, and another soldier throwing grenades from the other side. When the accompanying UAV goes to recharge, the assault stops until the UAV returns/replaces the UAV at the observation position.

4. UAV raids (both kamikaze and ditching) are used to divert the attention of the defender from approaching attack groups. When a UAV raid occurs, the defenders are either too busy firing at the UAVs or take cover, causing the approaches to the defended positions to become unobservable. The enemy may use a combination of artillery preparation on some positions and simultaneous UAV strikes on others as part of a single offensive plan.

The military suggests the use of electronic remote monitoring as a countermeasure.

In the case of a dugout that is sheltered from both shelling and UAV strikes/drops, there was an example of a television surveillance camera attached to a pole, the signal from which was output to the dugout. An example was given of a television surveillance camera attached a pole, the signal from which was output to the dugout. During the day, the pole was upright and the camera was working. At night, the pole was lowered and the camera's batteries were recharged without removing the camera from the pole.

5. Both sides abandoned reconnaissance on foot. It was replaced by UAV sorties.

6. It is noted that anti-tank minefields in the vicinity of forward positions are almost always laid in the open, i.e. the mines lie on the ground. This is due to the fact that they are laid at night and it is necessary to reduce the time spent in the enemy's firing zone. It is necessary to set up the minefield before the enemy notices the deminers laying the mines and reacts. If the mines are buried, it is not possible to create a minefield of sufficient depth. Burying requires more time. This led to the use of open demining. By visual detection from a UAV, the leading edge of the minefield is identified. Two pickup trucks with 6 deminers each (12 deminers in total) drive up to it, and they throw the mines aside by hand to make a passage. They move at full height. Clearing the passage thus takes only a few minutes, after which the demining team leaves. Often the defending troops do not have time to react and open fire.

7. When our deminers are detected laying a minefield, the enemy may not engage them with fire, but rather observe and record the locations of the mines with UAVs. In this way, the position of the minefield becomes fully defined. Afterwards, a concentrated artillery strike was made on the minefield to make the passages. Given that the depth of the minefield is usually not very deep, the enemy does not have to shell a very large area of terrain.

When discussing with servicemen the unsuccessful experience of using artillery shelling of minefields in other parts of the front,

They suggested that the ineffectiveness of artillery shelling was due to the fact that the approximate location of mines was shelled. If accurate information on the location of mines is available, more concentrated fire may be possible.

FROM THE AUTHOR. The method requires verification, as modern mines are very resistant to close bursts of artillery shells. The method can work on minefields installed in bulk, as the mines will simply be scattered by the blast wave from the shells. In general, the complete predictability of the location of a minefield to the enemy to within a meter (and the possibility of communicating this information to lower units via electronic devices) can indeed affect tactics. Earlier discussions with engineers indicated that minefields are stopped not only by physical effects, but also to a large extent by fear of the unknown. Soldiers are afraid to move where they might be hit by a mine.

8. As a means of clearing our minefields, the enemy tried to use their remote mine-laying installations. Their mines were thrown into our minefields with a set minimum time for self-destruction.

FROM THE DRAFTER. See the comment above on point 7.

9. Movement through forest belts remains meaningful even after the leaves have fallen and even after they have been broken up by artillery, when the belts become transparent to aerial observation. They create a strip of land with a background in which camouflage is relatively effective and detection and visual tracking UAVs is difficult. Broken tree belts with masses of branches on the ground are good camouflage. In the field, soldiers will be immediately detected, and visual tracking of their movements is not a problem

difficulties. The movement along forest belts is not abandoned even in winter, after the leaves have completely fallen. In particular, forest belts are used for stealthy convergence at night, one at a time, to a buildup point. Given that it takes only about 10 men to accumulate for a crawl attack, the camouflage properties of the forest belts are retained even when the leaves fall/are broken by artillery. By now, both sides have abandoned field attacks.

FROM THE WRITER. It is possible that the use of heat-retaining cloaks at night would allow crawling attacks without being tied to forest belts. Such a method was described in Report No. 2.

10. Artillery preparation began to ensure not only the attack itself, but also the withdrawal to the initial positions. Often the artillery opens long before the attack itself, as if to teach the defenders that they are under planned fire. Under its cover, assault groups are delivered in passenger cars to the initial positions for the attack. The vehicles leave, and then the assault teams move closer along the forest belts to the positions they plan to seize.

11. There have been no successful cases of armoured vehicles being used en masse by servicemen, either by us or by the enemy. Tanks are used exclusively on a "roll-out" basis - they move in, fire 3-4 rounds and leave.

12. The enemy used the minefields in the rear of our troops and left a limited number of passages in them to his advantage. The passages were detected and blocked by the enemy by means of remote mines at the start of the offensive. In this way the front edge of our defenses was isolated from the rear.

13. The tank carousel is used with modification. A newly arrived tank should not occupy the same position as the previously fired tank. The position is occupied approximately in the same area,

but in a different location. As a rule, shooting positions inside forest belts are used for shooting.

14. It was noted that a significant obstacle to the use of modern equipment is the "accounting" approach to writing off equipment lost in combat. It is common practice to penalize the loss of equipment in combat by not issuing new equipment. As a result, incentives are created to preserve equipment by not using it in combat.

FROM THE DRAFTER. In the past, a similar problem has been encountered in the decommissioning of large UAVs, where the decommissioning of the equipment requires taking an individual specialist out of combat for several weeks.

15. The servicemen believe that reconnaissance UAVs should be used instead of SBR-5 short-range reconnaissance stations, and the position should be replaced with a short-range UAV operator. SBR-5s are very quickly detected by the enemy. The UAV operator will not only be able to conduct surveillance, but also assist in company fire control.

16. For tank battalions, it is desirable to reinstate deputy police officers, as the amount of documentation to be kept by the commander makes it very difficult to engage in direct management. There is also a great deal of duplication of records between the commanders and deputy commander's lines. Officers believe that the number of records in combat conditions should be reduced compared to peacetime. In general, the use of deputy police officers seems appropriate. It is noted that in reality a commander can only use the method of direct coercion of subordinates to fulfill a task. The deputies can use an individual approach and create conditions for conscious fulfillment of tasks.

17. It is noted that the use of warrant officers (not officers without higher education) in positions responsible for weapons in companies is ineffective. There are exceptions, but as a rule, they do

not fulfill their duties well.

18. During the training of former Wagner personnel, it was noted that some of them were accustomed to aiming with their rifles not by taking an "even aim" when the front sight and the rear sight (the slit in the sighting bar) are aligned, but by taking the entire aim so that the front sight is fully recessed in line with the bottom of the slit. Presumably at short distances this method of aiming is permissible, but at medium and long distances it will result in a miss. The bullets go lower.

19. The following approach is used as a method of countering the enemy's heavy drop UAVs (Baba Yaga): our surveillance UAVs with thermal imaging cameras (Baba Yaga is used at night) are launched into the air at a relatively high altitude and control the surveillance sectors assigned to them. When the Baba Yaga passes over, our drone lands on top of it. In a UAV collision, both drones fall to the ground, but as a rule, they suffer minor damage and remain repairable. As a rule, only the blades and the beams that carry them are broken. Of course, when picking up downed enemy UAVs, keep in mind that they may be booby-trapped and laced with poison.

When using a similar technique ("dive" from above) against UAVs, the Fury flying wing has the problem that quadrocopters cannot make fast maneuvers. They change direction and altitude relatively smoothly. A flying wing UAV starts maneuvering actively when its operator receives information that an enemy drone is approaching it.

20. The military suggested that the staffing structure should have a mechanism to respond flexibly to innovation. It should have a reserve for unforeseen tactical or technical innovations that the commander in the field can introduce by directive. Conventionally, in addition to the current staffing structure, there should be a staffing structure for future periods. The need for centralized re-approval of staff structures reduces the responsiveness of the management mechanism to innovations on the battlefield.

21. There is a peculiarity in the enemy's use of attacking heels. The front five are armed exclusively with vehicles and are tasked with identifying the location of the enemy's firepower. The second five are armed with RPGs and PK machine guns. It moves 100-150 meters from the advance patrol. It is tasked with destroying our firepower identified by the first patrol. It is noted that the fire of the second squad can be directed over the heads and into the gaps between the soldiers of the front squad. The rules of safe firing are not observed. The safety of the front spot is ensured by eyeballing.

22. In the event of danger, the driver has the option of driving into a forest clearing in the immediate vicinity of the forest clearing to escape observation.

23. When the enemy failed to advance, he tried to use operational weapons to solve tactical problems. For example, there was a case in which 23 High Mars were fired at field defensive positions.

24. The above reports described the tactic of replacing Polish 60mm mortar fire with grenade throwing in the general direction of the attacking trenches. It was used by the enemy to mislead the defenders as to whether the attackers were moving to the assault. A dispute arose during the discussion. Some soldiers said that the polka was practically inaudible and, as a consequence, it was very difficult to distinguish the explosions of mines from those of hand grenades. Others insisted that

The "polka" is still heard for the last three seconds of the flight, and it is possible to understand that the enemy has switched to throwing grenades.

25. The "digging in" of enemy positions with shell craters is used. This allows the assaulting troops to engage in grenade combat in close proximity to the enemy trenches under attack.

26. Previously, the AFU maintained a division between soldiers involved in the assault and those engaged in excavation work.

Now, due to the decline in the number of servicemen, such a division is rarely maintained.

27. There have been isolated instances of enemy tactics such as "jumping on the tail of a shell", where enemy infantry attacks despite the continued shelling of the attacked trenches by their artillery. It is alleged that enemy infantrymen involved in such attacks are under the influence of drugs.

28. In conditions of low frontal mobility, the use of broken tanks buried in the ground and firing from closed positions (mounted) has proved quite effective. A tank buried up to the turret is concealed from observation by camouflage nets and possibly heat-tight cloths. The nets are removed before firing, after which 3-4 shots are fired. At the end of the firing, the camouflage nets are reinstalled. Returning fire at the area where the tank is positioned will not produce a result.

29. It is noted that the enemy uses two kamikaze drones at a time. Apparently, to ensure that a given target is hit.

30. Empty shell and ammunition boxes are used to build false ammunition depots. In some cases, the enemy expends considerable material and *time* to fire/discharge them.

31. The UAV is equipped with firmware that commands the drone to fly high up in the event of signal interference. At altitude, the effectiveness of the EMP is reduced, allowing the drone to regain control and not be lost.

32. Rolling up the dugouts does not save them from being detected by thermal imaging; the soil layer above the dugouts is still warming up. The only saving grace is that shooting at individual dugouts is ineffective.

33. UAV reconnaissance is conducted not only through direct observation, but also by photographing views of the terrain and then comparing them to identify changes over time. Activities should minimize changes to the appearance of the terrain, especially the camouflage of debris.

Oychëy № 16 oy 20.12.2023

Recorded from the words of senior officers at the regimental level

1. In the past two months, there has been a qualitative change in the enemy's use of kamikaze drones. The enemy has begun to use multiple consecutive kamikaze drone strikes against a single target:

- For example, on December 10, 2023, after our assault team captured the remains of a detached, not very large structure, it was struck in succession by six (6) FPV drones that flew into the window openings;

- Thirty-six (36) kamikaze drones struck in succession at the assembly point for medical evacuation vehicles under the bridge. The net covering the passage under the bridge was broken by the first two drones, allowing the others to attack the targets under the bridge;

- The kamikaze drones were used in pairs against a single vehicle traveling in the "gray" time of day, i.e. dusk. The task of the second drone was to kill the target if necessary.

It was also noted that the tactic of tanks and BMPs rolling out of cover for direct fire may no longer be effective. The enemy has time to send kamikaze drones to the rollout point, allowing the armored vehicles to be hit, if not at the firing position itself, then during the withdrawal from it.

2. Under the cover of a massive kamikaze drone attack, several drones are deployed in close proximity to defensive positions, including in the immediate rear. After the main massive attack is completed, the operators of the deployed drones wait for soldiers to emerge from their shelters after the main attack. The drones strike these soldiers at short ranges. Drones can be used to observe the appearance of soldiers either in flight or on the roofs of tall buildings.

3. The main method of attack used by our units is a combination of stealthy accumulation of a small assault group of 2-3-4 men at a starting position (e.g., 200 meters from the object of attack), a short artillery attack on the object of attack and a subsequent dash of the assault group, immediately after the artillery system ceases firing, to the object of attack.

It is noted, however, that it can be difficult to get people to attack. The "coaxing" phase can last up to ten minutes after the artillery attack has ceased.

Older soldiers and ex-prisoner soldiers who were hypodynamic while serving their sentence cannot run to attack. They walk at a normal pace to their targets.

To overcome the above problem, it is advisable to conduct marching retractions during the training phase, starting with marches of 5 kilometers and increasing the marching distance to 30 kilometers. If this is not done, soldiers will also discard ammunition, products, etc. during the exit phase to their areas of deployment.

4. When defending private sector houses, it is advisable not to place more than two men in a single position as the heat signature of more soldiers in one position becomes noticeable. Such positions are detected by the enemy during the night and subject to artillery strikes during daylight hours.

5. When defending in populated areas, the enemy seeks to create, by means of artillery fire, a swath of destruction between the positions of the opposing sides, where any shelters are destroyed (rubble).

6. In August 2022, during hot weather, the fields heated up during the daylight hours to the point where the soldiers' heat signatures were lost against the background of the field for the first couple hours after sunset. This allowed our units to cross the field at night, moving at full height, and take up positions close to the enemy trenches. The moon was close full, but the sky was covered with clouds. There was enough light

for a group crossing the field, but not enough for naked-eye detection by enemy observers.

7. The widespread use of thermal imaging cameras, including those mounted on UAVs, has made it impossible for reconnaissance teams to cross the front line. Reconnaissance is carried out almost exclusively by observation, including the use of technical devices.

8. In 2015, the following tactic of heavy sniper pairs was used to suppress the enemy for a long period of time during the positional war in Donbas. Two ASWC rifles were loaded with 6 rounds each (5 in the magazine, 1 in the barrel). The "heavy" snipers studied the front edge of enemy defenses and found 6 targets each in advance. For target reconnaissance, the enemy was provoked to fire by 5-7 minutes of firing at the enemy by the soldiers who made up the permanent garrison of our stronghold. After that, our firing soldiers moved to cover. While the enemy was returning fire on our positions, targets were being scouted. A security circle was formed around the positions of the heavy snipers by the soldiers of the guard group, including the "light" snipers. The heavy snipers would then fire six consecutive shots at six selected targets and immediately begin their withdrawal. This minimized the time given to the enemy to open counter-sniper fire. There was an experience when 17 targets were hit in a short period of time (they were also fired at).

"light snipers). After the losses, the enemy did not show any activity for more than two weeks.

Oychëy № 17 oy 30.12.2023

Recorded from the words of the technician responsible for the use of the UAV

1. According to unit statistics, there are about 5 hits per 100 free-fall munitions (FFL) dropped by the UAV, which means the probability of a hit is 1:20. The average survivability of a Mavic UAV with a moderately trained operator is 10 sorties. Statistically, two Mavic UAVs are lost per target hit. For a well-trained operator, the survivability of Mavic UAV can be up to 100 sorties, but there are only a few such operators.

2. The probability of being hit by a kamikaze drone is very high at 60-70%, and when two kamikazes act simultaneously in pairs, the target is almost guaranteed to be hit, but kamikaze drones are only effective against pre-scouted targets (including those detected by other UAVs) or when on patrol on known high-traffic "trails". The FPV drones themselves do not detect targets well. If drones are sent to patrol an enemy movement route and are running out of time, they are directed to an alternate target.

3. For FPV drone attacks, it is convenient to use operators working in twos. In such a team, one operator is the lead operator and the other is the slave. When three or more operators are working simultaneously, it is difficult to work together. The drone operator has an excitement associated with the desire for his drone to be the one to do the most damage to the planned target. When there are many operators, there is an informal competition for a convenient kill trajectory. It is more practical to use multiple teams of two operators operating independently than to try to organize a synchronized team of more than two operators.

4. Given the widespread use of kamikaze drones in pairs, after the first transport hit, it is necessary to

If the vehicle is struck by a second impact, run away from the struck vehicle as there is a high risk of a second impact.

5. The usual depth of operation of small UAVs is up to 2 km deep into our defenses. In some rare cases, we have seen strikes up to 7 km deep.

6. The typical flight time of a kamikaze drone to the target area is 5 minutes. It takes about 1 minute for an operator to be reassigned to a new drone. Therefore, as a general rule of thumb, a pair of drone operators can strike once every 6 minutes. It is not possible to use FPV drones as a substitute for a "firing rampart" even on a minimal front. The time gaps between arrivals are too large.

If you use jettison drones, you must add the return flight time to the time it takes to fly to the enemy position. In addition, jettison drones fly slower and take 2-3 minutes to recharge. In other words, these drones cannot replace the "firing rampart."

The interviewee suggested that the closest drone sequence to a firing rampart might be that 12 kamikaze FPV drones could be simultaneously launched into the air when one platoon is attacking the position of one enemy squad. They must fly relatively close to the attacked position in advance. The enemy position must be monitored by another reconnaissance drone. When enemy firing points are detected, they are struck by an FPV drone. In fact, the stock of such drones is close to 2 drones per 1 enemy soldier.

7. Two pairs of FPV drone operators were observed to be used by the enemy. Each pair drove up to the firing position in a pickup truck. The vehicles turned around about a kilometer apart. And until the bodies of the vehicles were completely unloaded, pairs of FPV drones struck our positions in succession.

8. The FPGA drone operator should not turn on the video during takeoff. The video stream is relatively easy to intercept. That is, an adversary can easily see what the operator sees

of the drone. As a result, an adversary can use the terrain image to understand where the FPG drone's takeoff point is located and organize to fire on it. As a rule, the interception of images is performed by the same drone operators, who usually have a good image of the terrain and can lock on to it relatively easily from the video.

9. To counteract drones, fishing, wolleyball and bird netting are used. The latter is the most effective because they are not visible from the drone. If nets do not stop the explosion, they move the point of the explosion away from the target.

10. Infantry movements in forested areas, in particular, are due to the fact that even battered trees create a lot of visual obstacles for the drone operator's aiming. At least from two directions (front and rear) along a forest belt, targets are not visible at all.

9. It has been noted that artillery ammunition may contain poor quality powder. For example, a D-30 gun firing at 5-7 km can have a dispersion ellipse of 300-400 meters. The range of safe distance from the bursts of its artillery shells is up to 600 meters, which does not allow the attack to be completed after a few seconds.

"pressing against the bursts of their shells." The use of other tactics is required.

10. Minimization in the forest belts is limited and does not make attack tactics inside along the forest belts impossible. A large gray zone exists between the positions of the sides. Minimizing forest belts within this zone is dangerous for EOD. The enemy can remove mines laid in the gray zone. For this reason, only limited mines are mined in forest belts located in this zone. It is a general rule that unobserved minefields not covered by fire are not a difficult obstacle. Crossing forest belts is effective only in relative proximity to defensive positions. That is, an attacker inside a forest belt can cover most of the distance to the attacked position inside the forest belt without significant obstruction by mines.

Oychëy № 18 oy 03.01.2024

Recorded from the words of enlisted and non-commissioned military personnel

1. In urban battles the following tactics were used to capture buildings:

- The approach to the starting position was not under the cover of heavy weapons fire, but stealthily. The movements were often carried out at night;

- the initial position of the assault squad was placed roughly parallel to the front wall of the building being assaulted. The entire squad opened fire on the building to suppress the enemy;

- under cover of suppressive fire, the exit to the end of the building was carried out by "poker", i.e. covering from the flank;

- exit was done one at a time. The fighter who was the outermost in the chain on the side opposite the direction of coverage (e.g., if the exit was to the left side of the building, the rightmost fighter would start) would move out of the squad chain. He would pass behind the backs of his unit's men and start approaching the building face from the flank;

- 5-15 seconds after the first soldier started moving, another serviceman started moving approximately in his footsteps. The following soldiers started at similar intervals. When choosing when to start moving, they focused on not allowing more than two people to congregate at one point;

- The first two fighters to arrive at the end of the building were positioned to secure the location at the end of the building. The first at the far corner and the second at the near corner of the end of the building. If there was a basement entrance at the end of the building, an additional soldier would be placed to control it;

- The next pair that ran away formed a twosome, whose task was to enter the nearest entrance. In practice, the windows were never entered. The first number of the twosome controlled the windows between the corner of the house and the entrance. The second

number entered the entrance;

– further movement on the stairs after entering the entrance was carried out according to the "stream" principle, i.e. the fighter in front takes a position to hold the dangerous sector, the next fighter "overtakes" him and continues moving forward;

– When passing a flight of stairs, the fighter on the lower landing kept control of the flight and the next landing, while the fighter who had "overtaken" him climbed the stairs in a half crouch with his back forward, after 2-3 steps making a sharp jump up and down to inspect the upper landing;

– They did not enter closed doors, they only entered open apartments. They started breaking into doors only after passing through the entire entrance;

– entering the rooms was done dynamically by one fighter, maximum two. When entering at the same time, the second soldier physically touched the first room. After entering the apartment, there is a moment of disorientation when the soldier has to choose which room to enter next. To speed up the decision making at such a moment, the soldiers assigned themselves a rule, for example, always go to the left. Throwing an object into the room, such as a piece of brick, is very effective. Angle cutting was not used in the assault. It would slow down the speed of the assault. When moving A "stream" stopping forward means that a traffic jam" of 5-6 people waiting behind you may form, which is undesirable;

– the losses in this version of the assault were insignificant;

– After clearing the entranceway, a TM mine was used to blow up the passage to the next entranceway on the top floor. The next entrance was then cleared from top to bottom. However, after capturing one entrance, the enemy often retreated;

– When defending the building, the windows were almost never fired from, but from embrasures punched in the walls. Positions were fortified with sandbags. The defenders hold their defenses mainly on the first floor, as it is relatively easy to knock them down from the upper floors.

The standard size of an assault squad is 18 men.

2. When assaulting trenches, the "stream" scheme is also used, but

in twos. The twosome that has reached the branch of the trench occupies the

position and wait for the next team to approach. After the second double approaches, the first double clears the trench branch to the side. The second double waits for the third double to approach and begins to advance further along the trench. Individual soldiers cover the movement of the twos along the trench by being on the ground, firing over the bunkers. To mark the point at which a trench is being cleared, in practice the automatic rifle is swung above the bunker.

3. In a field attack, the following scheme was used: 5-6 SPGs pre-fire on enemy positions. During this shelling, they target the most important positions. After the pre-firing stops, the attacking infantry makes a dash to about 50% of the distance to the enemy and lies down. The LNGs then fire 2-3 aimed salvos at the enemy positions.

4. Tactical scheme of short-term armored vehicles operation
"It has been noted that from 300 meters to the enemy positions, the infantry has time to walk about 50 meters during the firing of armored vehicles. It was noted that the infantry could cover about 50 meters from 300 meters to the enemy position during the time the armored vehicles were firing. The rest of the distance had to be covered without the support of mobile fire support. At best, artillery support is available.

5. When going out at night (rotations), the corners of the turn were marked with paint cans, with paint cans on top of the cans. "umbrellas to make it difficult for drones to detect. If turning points are not marked, soldiers often lose direction.

Rotations in groups of 40 men are not advisable; it is better to use groups of 5-7 men with 10 meter distances during movement. It is easier for a small group to disperse if fire starts.

A large group tends to splinter into several piles due to soldiers walking at different speeds.

On the way to the positions it is desirable to prepare trenches where one could take cover in case of shelling.

This method will work if the rotation is done by a relatively small group.

6. The scheme of a "cavalry" attack is as follows: artillery shells the attacked position, 2-3 minutes after the end of the artillery shelling the infantry rush to it in 1-2 BMPs/BTRs. The rush point is the point that is the most broken during the artillery preparation or for other reasons the most convenient for rushing. Then the is made and ammunition is thrown in. The mop-up is carried out in the standard manner.

7. In battles in wooded areas, the enemy used to mask their tanks to match ours. This was done in order to get to a minimum distance from our positions of about 30 meters. From this distance the enemy fired 5-6 shots at point-blank range at our positions. The enemy tanks would then drive off to the rear.

8. The peculiarity of some forests in Ukraine is that they are planted and the observation distances along the rows of planted trees are quite large.

9. In discussing the reasons for rejecting large-unit tactics, soldiers suggested that one reason was the lack of reserves on each side. Large-unit tactics can lead to a where large, one-time losses are sustained and there is simply no one to replace them quickly. Under current conditions, large-unit tactics should not allow for static equipment. Any "traffic jam" will very quickly result in enemy artillery massing on standing equipment. Presumably, since it is extremely difficult from an organizational point of view to avoid this, large unit tactics are not used.

10. The need to orient every soldier to his or her location was noted. It was noted that the need to orient each soldier to his or her position is very common due to a lack of awareness of where he or she is.

11. When clearing populated areas, the clearing groups would march in a roughly chain-like pattern, roughly perpendicular to the direction of clearance.

the street that was being cleaned. That is, some of the soldiers went along the street, some went through the yards, but at approximately the same level.

12. Interviewees gave varying accounts of the use of "rolling" (one covering and the other moving). It was noted that this scheme was used, but the opposite was also said. Instead of "rolls", a split into twos that run at the same time is used, meaning that two soldiers in a twosome move at the same time.

13. There is information that a thermal imaging sight was artificially mounted on the LNG. This made it possible to use sniper terror tactics with the LNG. A very high probability of first shot kill was achieved.

Oychëy № 19 oy 03.01.2024

Recorded from the words of UAV reconnaissance operators The

* indicates statements for which there are comments from another person a specialist in the field of UAVs. See after the main text of this report.

1. If a "carousel" of observation UAVs is organized, a second UAV is sent to the first UAV when the battery of the first is below the level required for its return to the starting point. If the person correcting the fire also the operator of the first UAV, the control panels between the operators of the first and second UAVs are exchanged when the second UAV approaches approximately within the area of the first UAV. In this way, the corrective fire operator continues to make adjustments.

The average time to reach the surveillance point of a short-range UAV is 5-10 minutes.

Corrections are made by transmitting observations of bursts oriented to the sides of the world. The artillery calculates the corrections independently.

Ideally, in addition to the UAV operators, there should be a loader (bomb technician) who attaches the payload and changes batteries on the UAV. In some cases, the functions of the UAV pilot and the spotter are separated. In such cases, the pilot only controls the vehicle, but does not correct the fire.

2. Pauses in short-range UAV capability occur when there is a mass attrition of many UAVs in a short period of time. Such a pause can last until a new delivery. In general, the short-range UAV problem has been solved.

3. It is noted that the enemy uses UAVs with an inertial guidance (positioning) system, i.e. they do not use navigation radio signals during flight.

4. Long training courses of 3 months or more degrade the quality of combat readiness trained operators

UAVS. Ideally, UAV operators should be trained soldiers from combat units (infantry, ATGM operators, tankers, etc.). Prolonged training instills a mental stereotype of safety when operating UAVs, while in reality UAV operators operate from infantry and other front line units. As a result, operators trained in long courses are less able to cope with combat stress.

It is a mistake to think of UAV operators as necessarily highly trained specialists and aerial reconnaissance as a very complex discipline. Short-range UAV training can and should be taught to all soldiers. This would require three to four weeks of training*.

5. Just as a squad has a machine gunner and an assistant machine gunner, a grenade launcher and an assistant grenade launcher, it can have a UAV operator and his assistant. It is highly desirable that the platoon commander (squads and their commanders are too organizationally unstable due to rapid personnel turnover) have his own organic UAVs so that he does not have to negotiate and request the use of UAVs for platoon tasks, for example, from the commander of a separate company or battalion UAV platoon. The UAV operator should be close to the assault unit commander.

6. Enemy defenses are composed of multiple positions spread across the front and in depth*. The size of the positions can vary from squad, platoon, company, and battalion positions. This depends on ease of equipment and use. The defensive positions that make up a defense system are not equal in number of soldiers and firepower.

7. The enemy often uses remotely operated wire-guided machine guns. A characteristic feature of such machine guns is that they fire tracer bullets at night. This is easier for the enemy to correct with night vision devices.

8. It is important to take into account that in Zaporizhzhya and Kherson directions the radio horizon is much larger than in Bakhmut direction

In the first OPF, for example, drones can be used at distances of up to 11 kilometers. For example, drones can be used at distances of up to 11 kilometers on the first OPF, and 2-3 kilometers on the Bakhmut one.

9. The effectiveness of drop drones is relatively low*. The exception is when a specific object needs to be dropped and can be affected continuously. Dropping drones can also have a psychological effect, undermining the morale of enemy troops.

10. The tactical significance of working with kamikaze drones is very similar to the work of sniper pairs and ATGM teams. It is analogous to sniper terror tactics.

11. The only way to have a meaningful tactical effect with drones (using mainly agrodrones for dropping heavy munitions and FPV drones) is to systematically work the supply routes in the close rear of our troops. For example, due to the work of enemy drones, movement from Soledar to the line of contact can only take place at night.

12. In general, the enemy has a superiority in medium-range drones that can fly up to 15 kilometers (such as the Aileron, Granat, Valkyrie and equivalents). This is due in part to the fact that on our side, company-battalion commanders can no longer obtain drones at the expense of the civilian sector, on the one hand, and on the other hand, they do not have the administrative weight to obtain drones as brigade or corps commanders can.

13. Initially, the widespread use of low-motivated mobilized soldiers by the enemy led to the widespread practice of forcing the AFU to dig trenches as an educational measure. On the whole, this proved to be advantageous. Compared to Russian troops, the AFU dig trenches in almost all cases and at once, including under an arrow. The habit of entrenching on our side is significantly less developed.

14. In general, the established system of accounting for , which counts them as weapons in magazines, with a report when lost and entry in the combat log, is considered unbalanced.

On the one hand, it creates a sense of responsibility for the machine (it is more careful in use and harder to sell on the market). On the one hand, it creates a sense of responsibility for the equipment (it is treated more carefully during use and is harder to sell on the market), on the other hand, it is not too burdensome. It is important that accounting is NOT based on manufacturer numbers, as individual drone parts are assembled into a single device from parts of different drones. If tracking by manufacturer's numbers is introduced, it will create major problems in the operation of the equipment. Currently, it only tracks the number of drones assigned to a particular soldier. This system is the most convenient and practical.

15. On one occasion there was an attempt to organize a simultaneous attack by three small groups (10-12 people) from different directions. As a result, only one of the three groups went on the offensive; the other two had some reason for not launching an attack at the agreed time.

* * *

COMMENTS dated 05/01/2023 to the above information, from the words of a technician from another unit responsible for the use of UAVs.

To 1: Considering that the extent and rate of battery discharge depends on many factors, including wind direction (crosswind, headwind), UAV pilot skill, battery life, and the non-linearity of battery discharge rates, only a UAV pilot who regularly operates the UAV can know when to call for a swap.

Commenter believes that, in general, the short-range UAV problem has NOT been solved: there are no system deliveries of even commercial vehicles, no repair facilities, and no spare parts.

To point 3 The inertial positioning system is very inaccurate, because on a quadcopter the propellers create a significant air movement and there are practically no places where you can measure the speed relative to the air in the airplane way, using a Pitot tube.

To 4, 5. A poorly trained pilot will lose aircraft much more often than a pilot. Therefore, the transition to mass

The saturation of units at the grassroots level with UAV operators is only possible if there is a significant number of type (!) spare vehicles and the freedom to use them. In addition, a well-trained pilot has a better chance of hitting the target.

It should be noted that the use of airplane-type UAVs requires more knowledge than quadcopters and is currently reserved for a narrow circle of highly qualified specialists.

Allocating UAV operators to platoons can lead to poor transfer of experience and a decline in the quality of task performance by operators.

To date, UAVs are not standardized means of warfare, as they are programmable, flexible in customization and no standardization tasks have been set yet. Controlling them is not a flow knowledge and requires a certain amount of engineering skills as well as an understanding of atmospheric processes.

According to the interviewee's practice, the UAV team performs tasks at the request of units of different levels, from platoon to brigade. Such transitions are typical and their organization is not very difficult.

As fixed endurance (external antennas with signal amplifiers) becomes more common, the need for UAV pilots and operators to be directly in the combat lines of forward units will technically decrease.

Point 6: Defenses are often built on the principle that where there are cellars, there is a defensive position. This approach is not always rational, since cellars turned into dugouts become convenient targets for enemy firepower.

To point 9: UAV drops have all the problems of free-falling munitions. Considering that during the day the drops have to be made from an altitude of about 150 meters, the accuracy is low. In cases where the drone can be lowered to an altitude of

20 meters, e.g. at night when flying by thermal imager, the accuracy becomes quite high.

In addition, the commentator noted that there should be a separation between the UAV pilot, who moves the vehicle in the air, and the UAV operator, who manages the UAV payload. For example, you need to systematically monitor the signal strength, a drop in which could indicate an enemy's use of EMP. If the pilot and operator are combined into one soldier, it is possible to miss the onset of an enemy EEW attack.

It is also convenient for the UAV pilot to use conventional remote controls with smartphones or tablets, and for the operator to output the signal to a TV. The pilot and the UAV operator may not be in close proximity. Commands to the pilot can be transmitted by radio.

FROM THE AUTHOR. An inter-viewed operator of reconnaissance UAVs had an excellent opinion on this issue, stating that the separation of pilot and operators is true for vehicles larger than the Mavic. Where separate payload control is often appropriate.

Oychëy № 20 oy 05.01.2024

Transcribed from the words of the platoon commander

1. It has been observed that soldiers in groups of up to 5 people maintain the necessary distances and intervals, but in larger groups they start to bunch up. The more people in a group, the greater the likelihood that pile-ups will occur.

2. The use of surveillance quadcopters by commanders in organizing and escorting attacks results in a lack of clear guidance on attack targets and directions of advance. The commander has a clear view of the battlefield, while the soldiers on the ground do not see what the commander sees from above. The commander assumes that the soldiers have the same level of situational awareness as the commander, which is often not the case.

There was a case in which the commander landed the quadcopter on the ground in line with the direction of the enemy and turned on the lights on the drone to provide directional guidance. Unfortunately, this was noticed by the enemy.

3. When making rotations, anti-drone guns are used using the sky-sweeping method. This means that the rifles sweep the sky with a beam of radiation, even if the enemy UAVs are not visible.

4. Nowadays dugouts are being abandoned and "fox holes" are used more. Fox holes are not dug straight. In the projection from above they look like two letters G, connected by vertical strips with each other (lightning-shaped). That is, the "fox hole" is dug forward, then sideways, then forward again. The floor of the remote part of the fox hole can lower than the floor of the trench, i.e. an underground cell is created. This is done to avoid being hit by shrapnel when a kamikaze drone comes .

5. In the summer of 2022, soldiers dug a 50-meter-long tunnel at one of the positions with a slope of approximately 30 degrees. The soldiers had experience working illegal digging mines. They were fixing the ceiling in the manner of fixing in mines. Through this

tunnel

you could walk at full height. The tunnels could accommodate up to 20 people. The tunnel took about two months to dig out.

6. When making "fox holes", the entrances to them are covered with sackcloth heavily covered with mud. Such an entrance is difficult to expose even when in a trench. In one brigade there was a case when two soldiers hid in a "fox hole", the entrance to which was disguised in this way. They waited for the clearing party to pass and shot some of them in the back, some of them captured.

7. The long mine clearance line ("Serpent Gorinych") is cut into 50 cm sections to make a passage in minefields. The weight of such a section is about 7 kilograms. The sections are successively thrown by hand onto the minefield. A detonation is carried out. The detonation removes mines within a radius of 10 meters. Then another detonation is carried out, and so on. The entire minefield is cleared in a number of detonations. For a detonation you have to move away 50 meters. The detonation is very deafening.

8. The MON-200 is used to clear forest plantations from stretching. 9. Assaults are carried out in groups of 4-7 men. Seven people is practically the limit. Sometimes 3 people are used for assaults. Larger groups guaranteed to attract the enemy's attention and cause fire with cluster munitions, kamikaze drones, "Ba-boy-Yaga" and other firearms. Approach to the assault line is carried out as stealthily as possible. The formation for rapprochement is a column of one ("snake"), with the "snake" divided into twos, between the numbers of twos approximately 3 meters, between twos 7 meters. The numbers in twos follow each other. If it is not possible to take cover in forest belts, they try to initially approach each other by crawling. When approaching by crawling, all distances and intervals are maintained as when moving at full height. A stealthy approach is ideally carried out right up to the enemy trenches. Fire is opened only after detection. It has been observed that poorly trained attack aircraft start firing at the enemy from 100 meters away. This is not advisable. The first number is a fighter who has good bomb-making skills.

In addition to these persons, an evacuation group is also defined. As a rule, 3 persons. A distraction team may also be assigned.

The interviewee had only seen one attempt to synchronize small group attacks, when the attack plan called for a simultaneous sweep of all parallel streets in a populated area. The plan was not realized.

10. The time of night to morning or evening to night (twilight) or when the sun is blinding the enemy. At this time, both night vision/thermal imaging devices and the naked eye can see poorly.

11. At least 2 liters of water are usually taken to the forward positions for a rotation (2-3 days). For an assault, machine gunners take 400 rounds each and machine gunners 1,000 rounds each (the latter are helped to carry them). Given the shortage of magazines, it is usually not possible to have more than 4 magazines per gunner. The rest of the ammunition is carried in packs.

12. For barrel artillery fire, 300 meters is considered the safe distance limit; for 82-120 mm mortar support, 100 meters is considered the safe distance limit. When using artillery support, it should be borne in mind that fragments take about 3 seconds to travel to maximum ranges. The head must not be lifted or stood up immediately after a burst.

13. There was an incident when our AGS, which was about 1 km away, fired at targets 7 meters away from our assault team. The group was pinned down by enemy fire 2 meters from an enemy trench and could not advance. The enemy was 7 meters further away from the entry point of the trench. Our soldiers received minor wounds from their own fire.

14. When establishing defensive positions, a second line about 200-300 meters from the first line is mandatory. The distance depends on the terrain.

15. There was a case when a turret from a BMP-2 mounted on a homemade frame was used to set up a defensive position. The turret was mounted on a homemade frame from a BMP-2.

fired by a command over the wires. The turret never fired alone. There was always accompanying fire from other weapons. The turret was set up about 5 meters behind the trenches to the rear. The enemy was about 800 meters away. The enemy could not detect it for a very long time. The turret was able to inflict considerable damage on the enemy during rotations.

16. To increase the range of RPGs, the self-destructor is removed from the grenades.

17. An alternative to the stealth attack is a "cavalry" attack by a pair of BMP-2s with troops inside and outside (8-10 troops per vehicle). The BMPs start moving during the artillery preparation, and the artillery stops firing when they reach a predetermined position. The landing is carried out in close proximity to the enemy trench as close to it as possible. This makes it possible to skip through the minefields on the vehicles. The problem is that anti-personnel mines can be placed just behind the trench berm.

Minefields are usually placed at distances of up to 100 m, not safety reasons, but because minefields have a signaling role. They can warn of an attempted stealth attack by the enemy. If the field is placed too close to the trench, the warning will be too late, and few people will have time to occupy the cells to fire on the attacking enemy.

18. A metal shield on wheels was used to dig the sap towards the enemy. The enemy tried to fire at it, to no avail. It was used to dig a sapa 150 meters long, with a total distance to the enemy of 600 meters. The head of the sapa was used to fire RPGs at the enemy.

19. Under fire, run for 2 seconds at a time and take 2-3 steps.

20. Crossing the front line during the SWO stopped. The only time it was possible to cross the front line was in the pouring rain. A reconnaissance team attacked an enemy rear position. The enemy began to pull soldiers from the front line to fight deep in the defense. Taking advantage of this moment, our assault units attacked from the front.

In 2017-2018, the practice of taking languages was still widespread in Donbas.

The main reason for the inability to cross the front line is the use of cameras, surveillance UAVs, and motion sensors.

There is a practice where surveillance UAVs are placed on trees. They do not fly, but operate in video camera mode.

21. The following pattern of UAV interaction was observed. Two surveillance UAVs hovered over the front line. If a target is detected, two UAVs with drops and one kamikaze FPV drone fly out.

22. Minimization within trenches is not normally carried out. The exceptions are: a) either separate outlying positions for disturbance firing which are not planned to be used by the main personnel in the defense and where only certain specialists enter; b) or sham entrances to trenches which are outwardly convenient for initiating their clearance, but which are not actually used by the garrison to enter the trench.

23. If a MON-type mine is detected, it is fired with grenade launchers. Even if the mine does not detonate, it will be thrown away and the main direction of fragmentation will be upwards or into the ground.

24. There was a case when a fully covered trench was equipped. The canopy was made of logs in a single roll. The garrison of the trench was about 15 men. There were about 25 outrigger cells for firing. The embrasures in the cells were about 20 cm high. They were covered with camouflage nets. The trench was circular and had many exits in case the slabs collapsed. The timbers were covered with greenhouse clay and earth was piled on top. After the snow fell, the trench was almost completely invisible.

In order to make it more difficult to detect the trench, no work on its construction was carried out during the day, and during the work anti-drone guns were proactively scouring the sky.

25. When fighting in a trench, it is better to use a RGD rather than an F1, as the grenade may bounce and fall close to the thrower. The usual mopping-up pattern is for the second number to throw the

grenade immediately after the

The first number fires at the trench knee being cleared in a Somali manner (hands at solar plexus level) and then the first number bends out from behind the corner of the trench to visually inspect the trench. Ideally, the fire interpreter should be on automatic, but it is better to fire single shots. In this way it is possible to switch to automatic fire at the required moment without changing the position of the fire selector.

The maximum effective throwing range of the grenade is about 15 meters, beyond which it is practically impossible to hit the target.

When clearing a trench, there is an arm's length between the first and second number so that the second number can pull the first number away. It is not necessary to hold behind the back, the main thing is that the second number can reach the first number at the right moment. The other two go along the trench at the same distance as in the field, i.e. 7 meters.

26. At the range, experiments were conducted with Somali-style firing with the rifle held above the head. In most cases, the gun was fired into the sky or close to the feet.

A Somali shooter reveals his location and cannot shoot for long. Could be bypassed.

27. When clearing rooms in a building, it is better to shoot blind corners in the Somali way with a machine gun at the level of the solar plexus.

28. There was a situation where we had to pass the opponent. Movement was carried out in twos. The distance between numbers in twos was 10 meters. The twos started moving at an interval of 10 minutes. There were 18 men in the squad. In this way the whole squad was able to pass through without losses.

29. When defending high-rise buildings in urban areas, 120 mm mines are modified into large hand grenades. They are dropped from high floors onto attackers approaching the walls of the houses.

30. In managing mobilized and volunteer soldiers, officers find that rank alone lacks authority.

The military personnel are often older than officers, but they may be older than officers. They may be older in age than officers. They may have more civilian life achievements than officers. In some cases, they may have a similar or higher level of military training than officers and even more combat experience, such as servicemen who have previously fought in Chechnya or Donbas. As a result, orders are discussed in practice. As a result, there may be refusals to carry out the orders. Experience shows that officers are not ready to act in a system where orders are discussed. The military justice system cannot cope with this problem, as officers themselves try to hide the facts of disobedience.

Oychëy № 21 oy 05.01.2024

This is taken from the words of the scouting commander

1. Planning operations requires what is known as a "heat map" of the area. That is, a map on which elevations are marked with different colors. Such a map visualizes the terrain relief well.

2. Foot reconnaissance to the rear of the enemy no longer goes to the rear, because the concentration of technical means of reconnaissance on the front line is very high. Reconnaissance is carried out mainly by observation with the use of technical means of reconnaissance.

3. The primary method of camouflaging deployment observation posts is to disguise them as other activities and other units of relatively low value to the enemy. The goal is to make the observation position look like a normal infantry or engineer subdivision. It has become extremely difficult to disguise the mere presence of a position.

4. The main way to detect observation posts and remotely operated surveillance equipment is to guess their location for the enemy on the principle of "if I were the enemy's scout". If specialized instruments are available, surveillance lenses can be detected by technical means.

The main demarcating factors of observation posts are: road tracks near the CP, paths used for supply and rotation to the CP, as well as household garbage and waste products. Preventing the detection of an NP is the ability of the senior NP to minimize any movement in the vicinity of the NP. Any daytime movement in the NP area should be minimized. Rotation of personnel and delivery of supplies should be carried out strictly at night.

5. One of the most common mistakes when marching on vehicles is to lose the distance between the vehicles at the moment of

stopping. As a rule, even if during movement the vehicles maintain the established distances, when they stop they come close together, forming a convenient group target for the enemy's artillery.

Before the start of the march it is necessary to brief all mechanics-drivers on all possible variants of events:

- 1) the actions of each individual driver mechanic in the event of enemy artillery fire and defeat of one or more vehicles in a column;

- 2) Evacuation vehicles are assigned in advance. Evacuation vehicles are equipped in advance with a metal cable and a rigid coupling;

- 3) evacuation points for faulty equipment are determined in advance.

6. Training in the use of programs such as off-line maps, alpine quest, i.e. electronic terrain maps, should be made part of the topographical training of military personnel. It is desirable to conduct familiarization briefings with privates, while officers should be trained in the full functionality of these programs.

7. Mice gnaw on the wiring in tanks and fiber optic cables of surveillance equipment, damaging them. Often, wires from dome surveillance cameras, wires from communication, DER and REB equipment are camouflaged underground. In one minute, rodents can destroy the work of an NP that relies on technical means of reconnaissance. The distance from the camera to the monitor can be a considerable distance. It is not always possible to quickly diagnose and eliminate malfunctions. While this is still possible in the presence of grass and leaf cover, it is almost impossible to carry out repairs covertly in winter.

8. Militia/territorial defense units and similar units made up of former civilians with poor training should have 2-3 high-level specialists assigned to them to make them sustainable. This can be sufficient for a qualitative improvement in their performance and moral and psychological stability. Also

seconded specialists identify the most capable and trainable servicemen, who will form the backbone of the unit's management.

9. A unit that comes under enemy artillery fire for the first time is usually unstable. In some cases, a massive artillery attack may result in a loss of combat effectiveness. One way to overcome this instability is to involve the commanders of these units in working out various options for dealing with different developments. Three or four options under consideration may be sufficient.

It is also effective to provide a unit soldiers who are accustomed to artillery fire. Such soldiers will orient and deploy morally distressed soldiers as quickly as possible after shelling, thus preserving the unit's combat effectiveness.

10. In the army, the transition from the management of orders to the management of tasks is underway. This is due to the fact that many people from the civilian environment have joined the army for whom the authority of rank does not mean much. Having received an order, such a serviceman does not proceed to its execution, but identifies the task to be achieved by implementing the order. Then he acts as he considers necessary for the realization of this task. His chosen course of action may or may not coincide with the order received. Commanders try to ensure that orders are carried out on the basis of the formal-legal side of the issue, but this is not always possible given the time constraints and the combat situation.

FROM THE COMPILER. It is possible that the use of the "open order" system (Auftragstaktik, mission command) may be a solution to the problem.

Recorded from the words of a serviceman who participated in combat operations as an artillery adjuster in a control platoon, and who participated in combat operations in the Donbas before the beginning of the NWO as an infantryman

Observations as an artilleryman

1. To avoid hitting ammunition depots, a dispersed ammunition storage scheme is used. Multiple dugouts are dug in forested areas where shells are stored. Mobile depots are also used, i.e. some shells are stored on vehicles that periodically change parking places.

2. At the beginning of the NWO, artillery guns were also used in a battalion style and fired by batteries. During the storming of Mariupol, firing by divisions was used. Nowadays all guns are arranged in a gunnery style with large gaps. One or two guns are firing at a time, and in case of offensive actions a maximum of three guns. No more. Firing with the use of an artillery fan is practically never used. The refusal of battery arrangement is due to the enemy's having

"The guns are removed from the firing position. Even if the guns are in an UAS and the cluster munitions cannot destroy the installation, the guns are removed from the firing position.

The enemy has a standard gun spacing of 2.5 kilometers.

Nowadays, when firing at area targets and setting up stationary barrage fire, our artillerymen try to use MLRS instead of battery fire with barrel artillery.

When setting up a stationary barrage, the Grada-mi involves several rigs. One unit fires first, then another. After firing its ammunition, the launcher leaves the position. The launcher fires a series (salvos) of 3-4 rockets with time intervals between the series (salvos). Due to the dispersion of Grads, the firing has to be done as follows

I would drive closer to the front line and work at an angle to the front line.

3. When firing 122 mm guns, the infantry during the attack approaches the bursts of their shells at a distance of 50-70 meters when fighting in populated areas, i.e. practically on the border of the zone of continuous defeat.

There are fewer casualties from dagger fire from machine guns, especially when the attackers are outnumbered compared to those defending the enemy fortifications. The risk of being hit by their own artillery fire is accepted.

4. Usually the position of the gun is changed after two series of 5-10 shots each. It is true that recently a tendency to change positions less has been noticed among our artillerymen. The interviewee does not know the reason for this.

5. A commercially available smartphone program is used to determine the location of the enemy. Smartphones are placed at a distance of 1.5 km. Minimum of three. The program determines the location of enemy guns with an accuracy of 250-300 meters at an approximate distance of enemy guns 12 km. Then an artillery reconnaissance drone is sent to the calculated location of the enemy gun, which already establishes the exact location of the gun.

If the area is visible from an observation post, the coordinates should be determined as quickly as possible by the observers using flashes of gunfire and smoke. The observers use conjugate observation. The accuracy of such a determination is 30-50 m at a distance of about 15 km.

6. Incoming recruits have poor map orientation skills. Even if they are trained in map symbols, many cannot relate the map to the terrain. It is advisable to conduct "blind fielding" exercises, where trainees are taken to an unfamiliar area and have to show a point on a map. Or a marching exercise with a constant change of leader, where the leader is periodically asked to identify the anchor point as well as the azimuth to the nearest settlements.

8. The enemy arranges his artillery in two lines: a) at a distance of about 10 kilometres from the line of contact - for precision firing, using approximately equal proportions of foot-launched and cluster munitions b) at a distance of about 20 kilometres - for area firing, using mainly active-jet shells with cluster munitions at extreme ranges. The second line fires with greater dispersion, but outside the effective ranges of our guns, i.e., without fear of counter-battery fire from our artillery. The second line can operate much more freely than the first. In particular, the second line fires on roads and roads.

9. The frequency of tanks hit by ballistic trajectory artillery fire by the interviewee's unit is 1 tank per 1-1.5 months.

10. In practice, AlpineQuest maps are used, as it has altitudes (the problem with data transmission to the network server is known and combated by this program). Off-line maps are not used because they do not have altitudes.

11. The system of transmitting information through the control hierarchy results in unacceptably long delays in the transmission of information. In practice, the aim is to establish a direct link between the adjuster and the gunnery commander.

There was a situation where our FPV kamikaze drone hit an enemy vehicle, damaging but not destroying it. There no second drone. It took seven minutes for the artillery to push through the artillery order to open fire, and another four minutes to redirect the guns to finish the vehicle. As a result, the enemy managed to hook the vehicle and drag it away.

12. Counter-battery fire is used to counteract counter-battery fire a "flickering" firing pattern. For example, a dozen guns are firing, first one fires a couple of shots, then the second, then the third, and so on. This makes firing at a fired gun of limited use. The gun itself is already silent.

13. The observation posts of artillery adjusters are usually located on buildings, because from them they can view the

roads. If they are placed on the front line, nothing but the enemy's front line will be visible.

14. Baba Yaga-type drones attack suddenly. As a rule, they fly to the drop site below tree level, very often along roads. It has been observed that the enemy tail our vehicles, hovering about 5 meters behind and above the moving vehicle. Following the vehicle, it penetrates deep into our defenses. "Baba Yaga flies at night or at dusk. In fact, it can be shot down relatively easily. It can be seen with night vision. But the problem is that it appears unexpectedly.

Deceptive maneuvers by UAV pilots also include crossing the line of contact in one place, then moving away abruptly and attacking positions deep in our defenses far away from the LBS crossing point. Drones can come from the rear so that our troops think they are flying our vehicles and do not take countermeasures.

Kamikaze FPV drones also often follow roads deep into our . To counter their volleys, nets are stretched along the roads. In particular, this was practiced during the storming of Artemovsk (Bakhmut).

The enemy also takes advantage of pauses in the operation of our REB systems when we shut them down ourselves in order to launch our UAVs towards the enemy.

Both we and the enemy are trying to change frequencies UAVs so that they are not affected by wearable "shotgun" or "suitcase" type radars.

It was repeatedly noted that enemy surveillance drones often land on rooftops to observe from there or wait out the EOD.

15. The tanks arranged "tank merry-go-rounds", moving 300 to 500 meters to the front line. Continuous fire from the tanks in the "tank carousel" was maintained from slightly different positions. For example, the first tank would drive up to a certain point. After the ammunition was discharged, it would leave. The second tank would drive out and fire from the road to a specified point before reaching it. After the cease-fire

A third tank joined the fire, but it was firing from a camouflaged position, i.e. without moving out.

After the enemy suffered losses, enemy "tank merry-go-rounds" became rare. Now 1 or 2 tanks fire from prepared and camouflaged positions. After 2 or 3 rounds, the tank changes position.

19. It is noted that failure to inform the adjusters why their transmitted information on enemy targets is not realized leads to a loss of interest and activity in combat work.

Observations as an infantryman

1. The interviewee had to be in a situation where the enemy completely suppressed his position (drove him under the bumper of the trench). The enemy fire group consisted of a machine gun, a sniper shooting at the AGS crew, a BMP-2 and an 82 mm mortar. The enemy maneuvering group approached at a distance of about 70 meters. It was impossible to get out of the foxhole for aimed fire. The course of action was to aim the AGS at the enemy by sound. For this purpose the enemy from the maneuver group was called for firing by firing in Somali overhead over the bunker. The approximate location of the enemy was determined by ear and the AGS team was told by radio where to fire. The AGS fire was corrected to the sides of the world. The enemy attack was repulsed.

2. The enemy has been known to cover the embrasures with metal nets and cut a small hole in them for a machine gun barrel. This is done to prevent a kamikaze drone from entering the embrasure.

3. The training of infantry soldiers should include the skills of self-organization without commands from commanders, such as taking up a combat or pre-combat formation and distributing controlled sectors when moving through various types of terrain. The lack of such skills leads to crowding and the transformation of an infantry unit into a crowd and, consequently, a convenient target.

1. The use of aerial bombs, artillery, and heavy against the entrenched enemy does NOT ensure their complete destruction in underground shelters. Without the use of infantry units trained to destroy the enemy underground, it is not possible to clear the area, even though the structures are completely destroyed and there are no shelters on the surface. The soldier assumed that the enemy was using a tunnel defense system, but had no confirmation of this. The enemy's system of tunnels and communication routes includes the basements of destroyed private sector houses. They are connected to each other. The passages are masked. This creates a communication network.

The soldier mentioned that in Vietnam, the Vietnamese used the tactic of plugging the tunnel with backpacks and covering the gaps with clay to prevent the Americans (so-called "tunnel rats") from gassing the tunnels. In this way, several isolation walls were made. The soldier assumed that the enemy was doing something similar to counter the spread of aerosol spray from the volumetric explosion of heavy flamethrower ammunition.

2. The enemy is able to compensate for the reduced firepower of artillery with massive use of UAVs. In fact, the enemy's UAVs have taken over most of the artillery's tasks. The enemy can engage up to six kamikaze drones simultaneously in an attack on a single target, making evasion virtually impossible. You can dodge one, up to a maximum of 2 drones. 3 drones attacking a target is a guaranteed hit.

3. When the enemy crosses a river by boat, approximately every second boat is equipped with an EPR system, which makes it difficult for our UAVs to destroy it. It is possible to destroy a boat equipped with REB, but it requires a higher skill level of the pilot

UAVS. These boats are fired on by AGS, mortars, and artillery.

The enemy makes extensive use of UAVs to supply the forward garrison.

4. It is noted that the enemy makes extensive use of mobile REB systems.

5. Enemy tanks for fire support fire 3-5, maximum 7 shots from one position. 8 shots or more are very rarely fired. Such tanks are difficult to detect. They fire from closed positions. It is not possible to organize constant surveillance of the right bank of the Dnieper. This requires UAVs of the airplane type with long flight times and a long observation range. Therefore, the tank destruction cycle includes: a) the infantry unit giving an azimuth to the tank position from some point; b) the UAV flying out to detect the tank; and c) the UAV hitting the tank. Given the very short firing period, enemy tanks often avoid being hit.

6. The enemy's use of commercially manufactured fuzes for kamikaze drones accelerates pre-positioning and, consequently, the speed of UAV crews' response to requests from the units they support.

1. The following method is used to achieve an effect similar to suppression by artillery fire (almost continuous gaps in the defending enemy's position, making it impossible to get out of cover to fire on the attackers). Assault infantry, coming to the initial position launch an attack, deploys attack drones on the ground (roofs of buildings, roads) taken from their locations (concentrations) and activates them. The drones are deployed in the locations that are most appropriate from the point of view of subsequent attack support. This allows the drone takeoff sites to be closer to the attacked enemy position, which reduces their flying time. Drones are prepared by the UAV service in such a way that they can be made operational as easily as possible in a single action. Not all attack pilots are familiar with the drone launch procedures specified by the manufacturers. The drone deployment site should not be in a radio shadow so that external UAV pilots can connect to (activate) the drones from a distance, from their positions in depth. External UAV pilots use directional antennas. In the Kherson direction, the right high bank of the Dnieper River helps the enemy in this. The drones then start hitting the attacked positions. Due to the fact that the sub-light distance is very short, it is possible to achieve a suppressive effect on the positions. The bursts from the drone strikes are followed by minimal time intervals between them. This allows the attacking infantry to get as close to the attacked positions as possible. An assault team can carry more than two dozen drones for subsequent terrain deployment, the number of drones is limited only by the resources and organizational capabilities of the enemy.

One of the not very common but used UAV application schemes is the following. A strike UAV can

land on the roof of the dugout or building where the enemy is hiding and await further command. The surveillance UAV determines the moment the enemy leaves cover and strikes. The flight time of the strike UAV is only a few seconds.

2. The following tactics were used by the AFU to deliver reinforcements to the bridgehead on the left bank of the Dnieper. Initially, reinforcements land on islands between the main channel of the Dnieper and the Konka River. The reinforcements cross this stretch of land on foot and take up a position on the western bank of the Konka River at a designated location. An empty motorboat then travels at maximum speed along the Konka River and approaches the same point. It was noted more than once that the boatmen wore the highest grade of armor protection available.

With no one in the boat except the boatman, you can maintain a higher boat speed and make sharper maneuvers. It is very difficult to hit a boat traveling at high speed. Often our soldiers do not have time to react to a passing boat and fire at it, and the size of the target on a boat that can be stopped by hitting it is small. Boats are filled with foam from the inside, and hitting the boat itself without hitting the boatman or the engine does not stop the mission. After approaching the secondary landing point, the boat picks up reinforcements and crosses the Konka River in a matter of seconds. The boat takes the reinforcements and literally crosses the Konka River in a few seconds, landing the reinforcements on the other side. Secondary landing and disembarkation are completed very quickly.

3. The problem of suppressing their own drones' REBs is solved by establishing REB-free "corridors" through which their drones can fly to enemy positions. Unfortunately, such corridors are often formed chaotically rather than as a result of planning. Forward units use EOD assets in an uncoordinated manner, not only at their own discretion, but also without notifying UAV units. It takes time for a newly arrived UAV team to understand where their own troops are using EW and where they are using EW.

They don't use them in the field. Inexperienced calculators/pilots lose drones due to control errors, but assume that the loss was due to EOD. This also makes it difficult to get a complete picture of the EOD fields.

A common chat room in one of the messengers is used to create corridors in their REB fields. The Internet for the chat room is obtained as best they can (Tricolor, Starlink, various amplifiers). The main task is to find a chat administrator who is sufficiently authoritative in army circles to verify people when they connect to the chat. In particular, the chat administrator was a responsible member of the special services. It is not easy to use a general chat room, as it is necessary to allocate military personnel who monitor the messages in the chat room. The chat itself is not self-sufficient. The main problems in using the chat room are: the lack of a unified grid of coordinates, which makes it very difficult to be geo-referenced; and the non-compulsory nature of chat messages. Information may not be posted or may be posted late and deemed unimportant. The Internet goes down periodically for various reasons, which makes it very difficult to keep track of messages in the chat room.

4. Fire correction from drones, if the drone is not stabilized and the pilot is not very experienced, has its own peculiarities, namely the frequent need to spend a certain amount of time after observing the burst of the projectile for the operator (external pilot) to restore the UAV's orientation. The rate of fire should be tied not only to the technical capabilities of the firing system, but also to the capabilities of the operator (external pilot) of the surveillance UAV to restore its orientation.

Firing at a fast pace often cannot be effectively corrected from the UAV. While visually searching for a burst location far from where the drone is hovering, the operator's attention is distracted from keeping the UAV in place. This can lead to the loss of the drone, as the operator (external pilot) may not always be able to orient where the drone is on the ground after it has been significantly drifted by the wind.

For a number of reasons, observation UAVs operate practically without automatic stabilization (satellite stabilization).

is disabled, it is possible only by the sensors of the drones themselves). This means that in the presence of wind at altitude, which is almost always the case, the surveillance UAVs are strongly drifted. The drift can be up to 10 meters or more per second, meaning it can become significant in a relatively short time. The drift must be compensated for in manual mode. It can be difficult to notice the drift immediately, especially when observing at dusk or when observing at close range. It can take 30 seconds or more for the operator to realize that a drift is occurring. During this time, the drone can move several hundred meters. If, for example, the wind is blowing toward the enemy, the drone can be carried by the wind toward the enemy.

There are situations when the HQ officer realizes that the drone is in ace mode (i.e., without stabilization, when the drone does not keep itself in one place by sensors compensating for wind effects) and the pilot checks his position too often, moves the camera away from the observed position, then a command to descend (i.e., go to an area with less strong wind) and stabilize may follow, and the firing will be paused.

To reduce the problem, the first UAV flight is a test flight. The first UAV flight is a test flight to determine what wind is available at what altitude and to select an echelon (altitude) with minimum wind.

The wind can change during the day, other peculiarities may appear, pilots need to learn day and night routes, memorize a new map of the area, so it takes 2-3 days for the UAV crew to get into effective operation at a new location.

5. When accompanying assaults with UAVs through individual soldier coordination, it should be realized that the UAVs accompanying the assault will have to be replaced due to battery drain. If the number of UAVs is insufficient, drones from neighboring (adjacent) units may be required to maintain a "carousel" of continuous observation of the assault. In this case, information will be transmitted by the UAV operator, most often through the staff officer, rather than directly to the assaulting

soldiers. In particular,

it has to do with the communications equipment being used. The staff officer's communications are more powerful, and the assault commander may simply not be able to hear his colleagues, so the staff officer retells what is happening to him. This leads to delays and certain distortions in the transmission of information. The fact that the assault commander and the staff officer, tuned to the frequency, hear the same information from the drone operator simplifies the situation somewhat, but does not completely eliminate the problem.

6. RER systems are usually able to locate the UAV's control panel, but given the high saturation of electronic devices on the front, it is impossible to fire at every device emitting a radio signal. That is why the enemy's attention and fire are attracted by the devices that stand out from the main mass in terms of emitted signal. In particular, when new pieces of equipment arrive that differ in their parameters from those previously used in a given area, the enemy can organize fire them. The enemy pays particular attention to the systematic nature of signals and their localization. Additional reconnaissance is always carried out if possible. If UAV sorties are made continuously from the same location and without camouflage measures, the area where the UAV operator group is located is very likely to be fired upon. If the UAV operator group is a danger, Excalibur and other expensive means of defense will be spared. If additional reconnaissance is not possible, they may prophylactically fire on the UAV operator group's quadrant.

7. The use of heavy Agrodrones to supply forward positions is complicated by the fact that the departure point and loading location are tracked by the enemy. After several flights from a single point, the initial depot from which the agro-rodron is launched is likely to be hit. The use of unmanned electric trucks seems more promising.

8. The interviewee voiced a suggestion. In forest belts and wooded areas, artificial walls can be built of transparent, low-visibility for a drone, but visible for a person on the

on the ground of the netting. When attacking a strike drone, the soldier lures the drone with him, and the drone crashes into such a wall.

9. Recently, there has been a tendency to prioritize drone range over maneuverability. In order to increase range, drones have to be redesigned in a certain way (increase battery capacity), which leads to a deterioration of the drone's controllability in the air. The maneuver requires a high current output. This is sacrificed in favor of battery capacity, which allows the drone to fly farther and carry more cargo. This applies to assemblies with 18650 batteries.

Now there is an alternative - paired high current batteries, it's more expensive but allows you to maintain maneuverability without sacrificing distance.

10. Multiple drone ambush is possible when it is possible to bring and deploy drones on the ground behind enemy lines, e.g. with the help of DRGs or sympathetic locals. The application scheme is as described in paragraph 1 of this overview. It is important to choose a location so that UAV operators can connect to the UAV remotely.

11. A company of UAVs is usually 8 teams per 2-3 km of frontage. These teams are distributed either in residential buildings or in dugouts with remote antennas. They need to agree on the frequencies to be used so that they do not interfere with each other. There may be a waiting list for the use of certain frequencies. In some cases, video frequencies used for drone control have to be held back to prevent other teams from taking over.

12. There is always at least one other person working with the UAV pilot, a technician, who monitors the operation of the transmitters, in particular the technician can change the direction of the transponder radiation if the UAV's flight path requires it. In some cases, the team may include a bomb engineer who works with ammunition, activates and monitors drone launches, sets them up on takeoff sites, and fixes mechanical problems on the ground. However, more often than not, the functions of a technician and a drone engineer are performed by the same person.

13. The maximum number of drones the interviewee saw being used simultaneously was six attack drones, with one seventh observation drone operating with them, which was used to monitor and control the six attack drones.

14. The distribution of targets between attack drones and artillery systems is as follows: attack drones tend to be used on moving targets, artillery systems and tanks on stationary targets. However, this is not a strict rule and often depends on the number of artillery shells available.

15. The use of quadcopters (short-range UAVs) by artillery units is complicated by the fact that they are far from the front line. It is not always convenient for them to send their UAV operators to the front line. Therefore, artillery units have to rely on information from "outsider" units in the front line.

16. There have been cases where the drone has recognized a cloud as a solid surface and refused to descend through the cloud. The drone may also refuse to recognize snow as ground, making it difficult for the UAV to land. This is abnormal drone behavior, but it is important to know it happens. Failures accumulate.

17. Given that the drone may contain a mine that reacts to metal objects, it is dangerous to use a metal cat to pull down a downed drone. Long wooden poles about 5 meters long are used to push a downed drone out of the way.

If possible, it is best to let a downed enemy drone rest for three days, waiting for the batteries to run out and for any type of electronic fuse to become deactivated. However, battery life is gradually increasing with the introduction of new technical solutions.

It is not uncommon for drones to be deliberately planted near an enemy position, either as a mine or with an autonomous, covert GPS receiver, so that the enemy picks up the drone and takes it to its temporary location.

dislocations. This makes it possible to detect such a temporary deployment point and subsequently fire artillery systems at it. In such cases, any systems that can be disabled in the drone should be checked and disabled.

18. If the UAV crews use the "covert mortar tactic" (alternating positions to fire munitions at the enemy), 4-8 drones can be fired relatively safely from a single point. It should be taken into account that the drone has a significant flight time, which gives the enemy the opportunity to realize that it is being fired upon and to actively search for the crew. Then the enemy is very likely to detect the formation and start firing at it.

19. In order to save the drone in the event of loss of drone control due to enemy REB, the control panel should be programmed to switch to stabilized mode to safely raise the drone to altitude, but not to go down to the ground. This is because close to the ground there is a risk of losing contact with the drone due to terrain (radio shadow).

20. In order to prevent the enemy from tracking the UAV's landing site after returning from a flight, the return route is laid out through a forested area, over some kind of paved footpath. Knowing the trails, flying along them is easy, and the enemy loses the UAV in the foliage. Experienced pilots fly without trails, just through the forest.

21. The location for the sortie should be such that it is inconvenient for the enemy to find such a location. For example, UAV sorties from high-rise buildings are conducted through a window located on the opposite side of the building from the enemy. This is a specific example. It is important to calculate and outsmart the enemy looking for a launch position.

22. When an FPV drone flies into a building corridor or a room, it loses signal at some point. Therefore, it can only be hit at shallow depths indoors.

There is unconfirmed information that SIM card drones may be used. Such drones can fly inside buildings. Therefore, areas with nets or curtains are set up in buildings.

If a drone like this enters the room, you can try to escape by using the paddles.

23. In the near future, drones are expected to appear on the frontline that cannot be effectively affected by REB. This applies to drones controlled by an unwinding fiber optic cable and drones with machine vision, which do not need to be controlled in the attack area. The latter find the target on their own. Frequency shifting, including pseudo-randomization of the operating frequency, is also widespread. In the near future, the only way to combat UAVs may be to physically destroy them with firearms. For this purpose, specialized drone strike teams must be trained. Detecting and physically destroying drones requires skill. You should try to train at least two groups of four men per platoon-company level unit. More than two groups is possible, less is dangerous. To incentivize the destruction of drones, there is experience in introducing rewards for each drone shot down. Then drones in assault units are hunted down.

Recorded from the words of a UAV service member who previously participated in combat operations as an infantry unit fire support squad leader in the late spring/early summer of 2022, and then in the fall of the same year as a grenade launcher.

In the service of UAVs

1. One way to counter enemy quadrocopters is to intercept them with a UAV equipped with an approximately 1 m by 1.5 m grid attached to a rail. The net is suspended vertically. When an enemy quadrocopter is captured, the UAV interceptor operator must release the rail so that it falls and the enemy vehicle does not pull the UAV interceptor.

The main problem with this and a number of other methods of countering enemy quadcopters is the lack of a unified warning system, especially a system of landmarks (squares), against which soldiers in units within range of enemy UAVs can notify other units as to where the enemy UAV has been detected and where it is headed. The biggest challenge of Low Sky Air Defense is warning and targeting, not destroying enemy UAVs per se.

2. One of the problems in the organization of interoperability, including the organization of the fight against enemy UAVs, is the intermingling of units. In a relatively small area, there can be up to 15 units with different lines of command. In particular, this is due to the need to deploy in populated areas and small forested areas, where small groups of soldiers from different units form a "pie pie" and are intermingled. As a rule, in such cases, no commander takes on the responsibility of organizing interoperability. Units exist independently of each other, even though they are close to each other. The situation is more complicated if units use different types of radios.

FROM THE ORIGINATOR. In such situations, the standard rules for assigning responsibility for establishing communication and organizing inter-action in the absence of a separate order do not work (default: for communication along the front, responsibility is assigned to the right neighbor; for communication from the troops in the rear to the troops in front, responsibility is assigned to the headquarters of the unit in the rear). They are designed for a linear front, but in reality the troops are intermingled. A different algorithm is needed to assign responsibility for coordination to the commander of one of the units.

3. When using communications through the management pyramid, it should be taken into account that information moves up the management pyramid, it becomes distorted. Horizontal links between departments not only reduce the time required to transfer information, but also ensure that the information is more realistic.

4. The AFU uses the following approach to utilize poorly trained troops composed of billeted individuals. A more or less trained commander is assigned to a unit, and all maneuvers on the battlefield are set by a UAV flying ahead of the unit that indicates where to go. Such a team is usually accompanied by strike UAVs. The UAV used for navigation is not used for strike purposes. If several groups are operating simultaneously, each group is accompanied by a navigation UAV.

5. The tactical pattern of the enemy's use of artillery has changed. At the beginning of the war, the emphasis was on linking surveillance UAVs with artillery fire, which was the primary casualty infliction. Now, instead of inflicting basic casualties, the main task of artillery is to restrain the maneuver, pin the enemy to the ground, and prevent him from moving. The main task of inflicting casualties on such a constrained enemy is performed by attack UAVs.

5. A unit's own air defense can interfere more with its own UAVs than with the enemy's. Often it is simply not possible to take off.

6. Typically, the time interval from detection of an enemy position to UAV strike is 5-7 minutes.

7. The enemy makes extensive use of UAV remote mining, planting PTM-3 mines and improvised explosive devices, often using the Jonik universal detonator.

8. On a front of about 10 km, the enemy has a chain of 15 surveillance UAVs in the air at the same time.

9. The standard sequence of UAV attacks on tanks is a sequence of immobilization strikes (on the tracks, in the power compartment) followed by UAV strikes (both FPV and drops). After immobilization, the crews leave the tanks. From the interviewee's point of view, equipping tanks with full perimeter curtains is more important than maintaining full turret rotation. A 360-degree rotation is needed for tank combat, which is extremely rare. Mostly tanks operate from closed positions. The interviewee believes that the tracks should also be covered with curtains. This would limit mobility, but it is not particularly needed.

FROM THE COMPILER. It is interesting to note that this opinion was expressed before the beginning of active use of tsar-mangals for tank protection.

10. Heavy agrodrones of the "Baba-Yaga" type are used as aerial mats for FPV drones. "The Baba-Yaga also acts as repeaters. This allows to fly up to 30 km deep into the defense.

11. use of Starlink terminals allows the Baba Yaga UAV to fly low along the surface of the earth, as the flight commands and information are transmitted via satellite, i.e. from above. When using radio signals from ground-based devices

The ground surface controls create a large number of terrain areas where the signal is lost. This forces UAVs to be , which increases their visibility to the enemy and makes them easier to destroy. It becomes difficult to establish an advance route, and in some sections of the route, the route has to be raised to avoid losing the signal.

12. Given that both sides of the conflict use the same UAVs, it is extremely difficult for soldiers to determine whether a UAV is passing by their own or another's. In darkness, they try to use different combinations of the UAV's onboard lights to prevent the UAV from firing at their own vehicles.

13. The enemy has recently shifted the responsibility for supplying the garrison in Krynki from boats to heavy agrodrones of the type of "Baba Yaga". In order to prevent the detection of UAV departure points from the right bank of the Dnieper River, they try to use bad weather.

14. One day our troops managed to shoot down 30 enemy UAVs. It took the enemy two days to restore the UAV stockpile to its previous level.

15. When crossing by boat to the left bank, the enemy boarded boats in the Tyaginka River, then crossed the Dnieper and then entered the channels on the left bank. The area near the left bank was heavily overgrown with reeds and reeds. The boats could not be seen from ground level. Due to the lack of UAV observation UAVs, it was not possible to organize a continuous and uninterrupted observation of the channels and the right bank of the Dnieper.

16. A team of 4 soldiers armed with anti-drone rifles, automatics and 12-gauge shotguns loaded with two-zero shot (buckshot) is used to destroy enemy UAVs. Typically, two soldiers hold enemy UAVs with anti-drone guns (one is a "saw" and the other is a different model), while the other two soldiers fire either a) automatic rifles with accuracy devices, such as collimator sights, at Mavic UAVs that fly relatively high, or b) FPV shotguns that fly relatively low. Actual engagement ranges are 50-150 meters. At

ranges of 150 meters, buckshot is used.

There are no spectrum analyzers, they work by ear and eye and use thermal imaging cameras.

In the service of the infantry

1. The reason for not deploying small infantry groups (detachments) in a chain is, in part, that a single column ("snake") is less visible than a chain. This reduces the risk of artillery fire and UAV strikes.

FROM THE AUTHOR. The use of single column ("serpentine") instead of chain formation during an attack during World War I and the interwar years was explained by the fact that it was more difficult to hit a column with flank (oblique) fire from the defender's machine guns. The risk of an attacking unit coming under longitudinal (enfilade) fire from the front when moving in column one at a time was considered less significant than the risk of a chain coming under longitudinal (enfilade) fire from the flank.

2. The interviewee's vision of the optimal composition of a small infantry unit: a light assault trio, a fire support trio (machine gun, grenade launcher), an enemy UAV suppression twosome with a commander and a liaison officer. The last sub-unit serves as a reserve and casualty transport.

3. The stability of the AFU positions in Krynki is explained by the fact that the defense is based on the use of preserved cellars (cellars), each containing a garrison of 3-5 men. The cellars are too small a target to be effectively destroyed by artillery or aviation. A successful hit results in relatively few enemy casualties.

To reinforce the position, the enemy digs community passages between the cellars. The digging is done in a tunnel-like manner. Corrugated sheeting, slate is laid on the ground surface,

gates and other sheet materials. The trench is then dug from inside the cellar. The excavated earth is not thrown away to form a barrier, but is taken back into the cellar and then thrown away from the cellar. The entire volume of earth is taken out until a regular trench is obtained, but covered with sheet material. In the event of an attack by our troops, the sheet material is either tilted aside or raised on struts to form a 15-20 cm high slit (canopy). From this slit, fire is directed at our advancing units. Taking into account the fact that nearby ruptures cover the sheet material with debris and earth, it is very difficult to locate the route of the trench during the assault.

4. The difficulty of storming Krynok lies, in particular, in the large open spaces around the settlement. And the issue is not even just the implementation of the attack, but rather the organization of supplies. The groups entering the ruins of the settlement must be supplied in completely open terrain, where a mass of enemy UAVs are operating.

5. The interviewee considers it justified to abandon large unit tactics and switch to small group tactics. In 2022, he had seen attempts to attack

"As the enemy's artillery could not be suppressed, such attacks were invariably defeated by the enemy's artillery, corrected from surveillance UAVs. Since the enemy's artillery could not be suppressed, such attacks were invariably broken up by the enemy's artillery, corrected by surveillance UAVs. At that time, attack UAVs were used sporadically and did not play a significant role in combat operations.

6. In the fall of 2022, the following procedure was used for attacking forest belts. 1 km before the start of the forest belt under attack, an AGS was placed in line with it. This arrangement allowed to support the attacking group for 700 meters, taking into account the total range of effective AGS fire of 1700 meters. The forest belt was pre-divided into 50-meter sections. On electronic maps in smartphones, points were placed every 50 meters and assigned uniform numbers. The movement along the forest belt started in a single column ("snake").

At the moment of encountering the enemy, the first three men of the column turned into a conventional chain. At the same time, the AGS team was instructed to locate the nearest marked point to the detected enemy. The AGS team made three firing shots at one marked point farther away than it had been given. This was done in order to have a range margin so as not to hit their own soldiers. The AGS fire was then corrected by approaching. Shooting was carried out by firing three grenades each. The AGS grenades hit the enemy area. After that, the AGS was commanded to fire 10 rounds. If necessary, a second command was given to fire 10 rounds, followed by the command to "finish the snail. (The AGS commands used were: "give three", "give 10", finish shooting the snail"). The assault commander signaled that after the next burst the attackers should go to assault the enemy trench. With the last burst of the 10th grenade, two of the three servicemen in the "chain" made a very quick dash forward to the enemy positions, bent over, on bent legs. They went to the berm of the enemy's trench and pelted it with grenades. The third number remained on the cover. In some cases, the commander could determine on the spot that one soldier would advance and two would remain on the cover.

7. The general pattern of the offensive from a large tactical point of view at the present moment is that the enemy is squeezed out of the gaps between resistance nodes by small group tactics, squeezed into these resistance nodes, and then begins to subject these nodes to systematic concentrated fire. The enemy then retreats.

8. Making trenches in the open is not recommended. They are simply hit by attack drones.

9. When clearing trenches, the main emphasis is not on the gradual opening of corners at turning points of trenches by the "pie-cutting" method, but on blind Somalian-style trench penetrations with the following visual control of the trench knee being stormed.

10. When setting up on the ground, it is practiced to build dugouts per soldier rather than per unit.

11. Even when small groups attack small enemy trenches, the sequence of operations after capturing an enemy position should be planned in advance, and should normally include advancing beyond the captured position. Otherwise, a unit that has successfully completed an attack will be targeted by enemy artillery and UAVs.

Oychëy № 26 oy 31.03.2024

Recorded from the words of several platoon leaders

1. To establish reinforced defensive positions in populated areas, concrete basements are used for digging i.e. the floor of the basement serves as the roof of the shelter. The basement itself is intended as an additional layer (buffer) to absorb the shock wave of a shell explosion.

2. When constructing trenches, up to 90% of their length is overlapped by overlaps from above, and in some places long, fully overlapped galleries are formed.

3. When firing at small UAVs, single-target fire is the most advantageous mode of fire. Automatic fire produces poor results. In general, the effectiveness of small arms fire against UAVs is assessed as high, with 70-80% of the UAVs fired at being hit. They try to use precision sights, but often have to use standard mechanical sights.

There are cases of homemade racks for firing PCs at UAVs. Troops use installation of a DShK machine gun on the UAZ chassis for firing at high-altitude UAVs.

4. Detection of increased UAV concentrations above the normal level (5-6 in the line of sight) is a reconnaissance sign of either an enemy offensive preparation or an enemy unit rotation.

5. When conducting defensive operations, the enemy often lets attacking assault groups within 10-15 meters of defended points and opens fire at point-blank range. The mere fact of coming to an extremely close range does not mean that the enemy is not ready to offer resistance. Fire is opened from small arms and grenades are not used at the moment of the first strike.

An example was cited where this pattern of opening fire caused instantaneous losses of 3 soldiers killed and 9 wounded, forcing the attack to be abandoned.

FROM THE COMPILER. The practice contradicts recommendations to fire at the maximum effective range of small arms fire.

6. The berm of a trench is often mined. The density of mined berms can vary: there were variants of 1 mine per 3 linear meters of berm, 1 mine per 5 meters, 1 mine per 10 meters. MON-50 mines are often placed on the berm, as well as motion sensors.

FROM THE . The practice contradicts the requirements of the manual to maintain a safe distance when laying mines in front of a defended position. The possibility of detonation/throwback of mines during enemy artillery preparation is ignored.

7. Option of obstacles in front of the enemy position: at a distance of about 150 meters - anti-personnel mines, at a distance of 70 meters - the first line of barbed wire "tangle" (the width of the fence is 6 meters, the length is 30 meters), at a distance of 20 meters - another similar line of "tangle", on the barrier mines MON-50. The position was supported in depth from the second line by 7.62 mm and 12.7 mm machine guns and 82, 120 mm mortars.

8. The standard size of an assault team used now is 5-6 people, less often up to 10 people.

It was noted that the enemy simultaneously used two assault groups, whose actions appeared to be united by a common plan (one to distract, the other to capture), but they operated out of fire contact. There was no mutual support by fire. The enemy tries to initially approach the attacked positions unnoticed, ideally without being detected until he enters the trench under attack. A soldier who fought in October 2022 said the enemy's tactics are different now than they were then. In 2022, attacks were preceded by a long 2-3 hour artillery preparation. Today, they try to hold their fire until the last possible opportunity.

Conventionally, the standard firepower supporting a given assault group is 1 artillery piece, 2 mines, a tank (less often), 1-2 AGS.

The enemy has almost completely phased out the use of Polish 60-mm mortars, the sound of which was practically inaudible except in the last moments before the strike (a shot was heard). The enemy has now switched to the use of 120-mm Polish mortars, and it is noted that the sound of their mines is audible, although they are less noisy than our mortars.

9. Tanks are used for firing from closed positions at ranges of up to 3-5 km, sometimes up to 7 km, in the short-urgent roll-out mode. The main task of the tank when selecting a position is not to be within the range of the ATGM.

10. Helicopter firings of helicopters with NURS against defensive positions from a calibration are quite frequent and quite accurate, but they have little effect. You can hear the helicopter approach by sound, and the air defenses have time to warn of approaching enemy helicopters. It is almost always possible to take cover beforehand.

It is more dangerous to mount the NURS firing units on the pips. It is more dangerous to install boosters on the peepers.

11. The nearest notionally safe place where temporary stores for supplying the front line are located is approximately 2 km from the forward positions. Supplies are brought to this point in groups of 3-4 men on foot, using if possible. From this point to the front line, supplies are carried by pairs of soldiers.

12. The lack of skill in using maps (especially electronic maps) and lack of familiarity with topography among soldiers, especially drivers, is a major problem for logistics. Due to the fact that movements in the rear are forced to be made in small groups and single vehicles, soldiers are often misdirected. It is impossible to assign an officer or sergeant to every small group.

13. Antidrone guns without automatic frequency selection are of little use.

14. During the Ukrainian counteroffensive in the summer of 2023, there was a case when, in order to make a passage in an anti-tank ditch, the Ukrainian side sent soldiers with shovels to backfill the ditch.

15. One of the reasons for trenching in forest belts is the different density of the soil. In fields, the soils are loose, while in forests they are consolidated by tree roots and have more hard rock inclusions.

16. Positions do not allow for additional training of personnel, as they are visible from UAVs and are targeted by enemy artillery and attack UAVs. In addition, they are often widely dispersed, and relatively safe movement between positions is only possible during evening or morning twilight. A system designed for on-site refresher training by the platoon commander is ineffective. Refresher training should be carried out when withdrawing to the relatively deep rear. It was suggested that at least one-third of the platoon's personnel, and in particular all technical specialists (ATGMs, mortars, etc.), should be retrained in the rear.

17. The creation of regular UAV platoons and the centralized distribution of UAVs has resulted in infantry platoons not receiving UAVs, making it very difficult to perform missions.

18. The mortar support of an assault group by mortars is based on a constant change of firing mortars. Two, rarely three, mortars are used. One mortar fires, the other and the third (if available) move. At a given point in time, one mortar fires. An average of 3-4 rounds are fired from one mortar position, after which it is required to move to another position. This means that fire support is carried out in "flicker" mode, with inevitable interruptions in the sequence of shots.

19. Detection of AGS positions is difficult. For example, an example was given of an AGS position being fired upon for the first time only a month after it was equipped.

20. When clearing a trench, leave a serviceman on the surface to control the movements in the trenches from above, from the level

on the ground can be dangerous. He may mistakenly shoot at his own partner who has come down into the trench to clear it.

21. When clearing a trench, it is advisable to have a headset, which is used by the security services. The information coming over the radio from the UAV operator accompanying the sweep can be heard not only by our attack aircraft, but also by enemy soldiers.

22. A trench cleaning team normally consists of 3-5 men. If there is a UAV escorting the assault team, 3 men are sufficient to clear the trench. No. 5 in the assault team is a medic.

23. Troops often convert 82mm mines to fire RPGs.

It's written down

(a) According to the officers

1. Enemy boatmen operating near Krynki used wetsuits to reduce their heat signature in thermal imaging cameras while bringing reinforcements to Krynki.

2. During the enemy counteroffensive in the summer of 2023, there was a consistent change in the enemy's approach to organizing the offensive: a) first, the enemy used armored vehicles and vehicles outside of armored vehicles to attack through the open spaces between the forest belts; b) then the infantry began to move exclusively in armored vehicles, which still moved through the open spaces; c) the infantry was then allowed to move through the forest belts, but the armored vehicles still moved through the open spaces; d) finally the enemy gave up sending armored vehicles into the attack (they were used as fire support firing from the rear) and switched to action.

3. We are faced with a situation where forward units, which are about 4 kilometers away in an open space with no forest belts, are isolated. Any movement away from or toward forward positions triggers intense attacks by enemy drones. As a result, rotations and the carrying of supplies, even by single soldiers, are impossible. The only method of supply is water bottles and candy bars dropped to forward units by our drones.

4. The main problem with stopping our offensive at the beginning of the NWO was the inability to suppress the enemy's artillery. The enemy was able to win artillery duels by more accurate fire.

5. During the offensive in Krynki, the enemy used small infantry groups that found the positions of our soldiers in cellars and basements, engaging with them in a series of attacks.

fire contact. The houses and buildings with these underground structures were then targeted with artillery until they were completely demolished and the underground structures were destroyed. At that stage, the use of drones by the enemy was relatively limited.

6. It was noted that heavy agrodrones of Baba Yaga type were used by the enemy to deploy attack drones on the ground. UAV operators would then connect to them from afar and use them to strike our troops.

b) from the words of a former serviceman of the intelligence service of the People's Militia of the DNR who took part in the hostilities in Donbas before the start of the CoHE and in the first few months (up to and including the summer of 2022) during the course of the CoHE

1. The general pattern of infantry usually that the front three scouts detect the enemy, move back, and call for support fire from heavy weapons (artillery, tanks). After their fire attack, the front three scouts try to advance again. And so on until the enemy withdraws or is interrupted. When the infantry has succeeded in advancing, the supporting tanks also pull forward, but maintain sufficient distance behind the front three to remain in cover from enemy ATGMs.

The bulk of the infantry follows the forward three scouts in a highly sparse column can extend 200 meters or more. In general, the rest of the infantry, except for the advance scouts, is used only for consolidation and support functions. In particular, this allows the use of poorly trained soldiers in the main group.

In cases where heavy weapons (tanks, artillery) cannot be fired, heavy infantry weapons (machine guns, grenade launchers) are drawn up to the front line group during the battle, which also try to break the enemy with their fire.

The buildup of firing forces is very slow, so

How infantrymen reach the battle site of the advance trio one at a time and at intervals determined by the distances in a heavily sparse column.

The attackers generally move to infantry-to-infantry small arms combat only when they determine that there significantly fewer enemy soldiers in the defended position than the attackers and that they are not supported by heavy infantry weapons (machine guns, grenade launchers, etc.). The number of soldiers is determined mainly by the enemy's return fire activity.

The last small battles involving relatively large infantry units supported by heavy infantry fire on both sides that the interviewee remembers are from the Debaltsevo operation in 2015.

2. Automatic rifles proved to be not a very accurate weapon for shooting at drones, RPKs were used for this purpose.

3. At the beginning of the NWO, tanks used the tactic of continuously moving a pair of tanks in a circle in open space (fields between forest belts). Each tank of the pair traveled on its own circular trajectory, firing periodically in the direction of the enemy.

4. The line of safe distance from mine bursts of mortars was assumed to be approximately 500 meters in combat operations, and that of 82-mm mortars was assumed to be 100 meters. The advance of infantrymen to the line of safe distance under cover of mortar fire was used in combat operations. In this case, a single sprint from the safe distance line to the enemy positions after the transfer of mortar artillery fire from the attacked enemy positions was used only when the number of enemy soldiers in the attacked position was assessed as insignificant and the position itself was assessed as weak. In other cases the attack from the safe distance to which the attacking infantry had withdrawn during the mortar shelling of enemy positions was continued by crawling on the enemy. If during the crawl attack the enemy detected the attackers and opened fire on them, the attackers first lay down in cover. Then they withdrew to their original position and began preparing the attack by firing mortars first.

(a) According to enlisted and non-commissioned personnel

1. Camouflaged frame tents are set up in advance in forest belts to camouflage equipment locations. The tents are camouflaged with vegetation elements (shrubs). Both homemade frames and frames from domestic greenhouses are used. They are set up in good time before the vehicles arrive at the position. A concealing tent can stand empty for a relatively long time. When the equipment arrives, the tent is manually placed on top of the equipment. In this way the time required to camouflage the equipment is drastically reduced and, more importantly, it is very difficult to determine whether the equipment is in position or not. The time interval for detecting the equipment becomes very short. Detection is possible almost exclusively during the movement and a few seconds after its completion.

2. Trained dogs were used to make passes in minefields. They are trained to sit next to an exposed mine and then, after some time, to continue on to the next mine. The dog sat down sequentially at each mine it detected. The dog's sitting locations were recorded and the information on the location of the mines was used to speed up the clearance of the minefields. The dog was sent to the minefield at night.

3. The system of vacations for 2-3 days a month from the front line positions does not allow for full recovery. It is better to carry out rotations according to the scheme of 2 weeks at the front lines, 2 weeks for recovery/training in the rear.

4. To withdraw a unit from a forward position, one-by-one movement is used, with 20-25 minute intervals between soldiers. The entire unit can be withdrawn overnight in this manner.

5. Light small arms fire against UAV strikes is quite effective. Problems are encountered in engaging observation-

UAVs that hover high in the air. They can be heard but not seen. When firing at drones, automatic fire is used, including tracer rounds. Collimator sights are effective during the day and thermal imaging sights at night. The installation of stationary airborne observation posts with heavy machine guns and small caliber anti-aircraft guns has not proved its worth. Such posts are detected by the enemy and deliberately knocked out. The maneuverability of UAV firepower is important.

6. Attempts were made to hit the Baba Yaga UAV with a Mavik-type UAV. This did not work. The target kept getting away. One of the interviewees voiced a suggestion to hang a cable with a weight on the UAV so that it would get tangled in the propeller of the enemy UAV.

7. To ensure the passage of a group of 5-6 drones to the rear over the forward defensive positions in the forest belt, 12, 7 mm or 7.62 mm large-caliber machine guns are used to fire on these positions. Such fire prevents drones flying overhead from opening fire.

8. When you use a drone like Baba Yaga, it flies next to her. "Granddaughter, a lighter drone with a drop. After defeating a position with the Baba Yagathe Granddaughter hovers over the defeated position, preventing casualties being carried out.

9. There was a case of an enemy tank hitting a Kord machine gun position from about 4 km away, the second shot hitting the machine gun position accurately.

10. The simultaneous airborne flight of multiple UAVs is an indication of an imminent offensive action by the enemy.

11. Helicopter-borne IRBMs are widely used.

12. Due to the constant surveillance by UAVs, the effectiveness of nomadic firepower tactics has been greatly reduced. Detecting a firearm in a new position does not present any particular difficulties.

13. One of the interviewed servicemembers who fought in the spring of 2022 reported that one of the ways to stop

The armored columns were fired upon by the demining units that checked the roads for the columns' movement. The columns did not move forward without a demining check. Advancing forward, the forward units retreated when their ammunition was exhausted and they did not receive support from armored vehicles.

14. UAVs track soldiers moving through forested areas in the most sparse areas of such forested areas. The UAV hovers at a high altitude at a location that allows observation of an open (sparse) section of the forest belt. If the UAV detects moving soldiers entering the open area, the UAV descends to strike.

15. The enemy has switched to the use of low frequencies for controlling kamikaze FPV drones. In particular, the use of frequencies in the range of 425-435 MHz for controlling kamikaze FPV drones was noted.

16. According to the interviewees, without "lower sky" control (suppression of enemy UAV activity) an infantry offensive is impossible. The advancing infantry units are let in close to the defender and then cut off by the UAVs on duty. The defender then methodically dislodges the advancing troops with drone strikes and artillery.

b) According to officers charge of training at one of the training ranges in the NWO zone

1. It is noted that a long period of service (1-1.5 years) in itself does not guarantee a high level of a serviceman's preparedness.

2. The 8-man column formation of a motorized rifle squad (without gunner and driver mechanic), as given in the Combat Regulations (squad leader at the beginning of the column, maneuver group behind the firing group), is not applicable in the current circumstances, as it is designed to deploy the entire squad in a single chain. It is for this reason that soldiers armed with light small arms are placed in the statutory version backwards, in a standard deployment.

They have the longest time to move before reaching the chain line, as their place is on the flanks of the chain. Heavily laden soldiers from the fire team move a shorter distance]. The best option is to have the maneuver group in front and the fire team behind. The commander is placed at the junction of the fire and maneuver groups. This makes it possible not to lose the most powerful firepower of the division and control in the commander's person at the beginning of the contact with the enemy, and the advance group can be easily applied to the terrain in the first seconds of the firefight. Lightly armed infantrymen are also better able to conduct route reconnaissance and ensure the unit is brought into the fight.

In this variant of the column formation, the standard tactics when encountering the enemy are as follows: first, everyone falls to the ground (takes cover), then the forward maneuvering group (senior rifleman and two riflemen) deploys in one line and the following fire team (machine gunner, assistant machine gunner, grenade launcher, assistant grenade launcher) deploys in a second line. The firing group then moves in intercuts to the same level as the advance group to suppress the enemy with heavy weapons. Then, after suppressing the enemy with the heavy firepower of the infantry squad, the maneuver group attacks.

A squad can only really attack a position with 2-3 defenders. A more typical solution is to withdraw and aim mortars, AGS, and tanks at a detected enemy position.

In this case, the experience of the war in Chechnya, when withdrawal was carried out at a relatively short distance to the nearest convenient position for defensive fire, is inapplicable. Given that under current conditions a squad that finds itself in combat will be hit by artillery fire (including mortars) and drone strikes, the more appropriate course of action is to withdraw to a greater distance (complete withdrawal from the battle). It is better to roll up again afterwards, trying to take advantage of the suddenness of the action. The retreat is based on the principle that the one who has advanced farthest (first in, first out) retreats first.

All soldiers are responsible for fighting enemy attack drones, and fire must be transferred to them when drones appear.

A single column formation is used when moving in a forested area. In open terrain, a staggered column (serpentine column) with the same mutual arrangement of the elements of the fighting order is used. In open terrain, the distance between soldiers is up to 20 meters. The distances between elements of a squad formation - head sentry, core and rear sentry - are up to 50 meters. In closed terrain these distances are reduced to the range of stable visual communication.

3. The interviewee suggested that the grenade launcher assistant and the machine gunner assistant could be eliminated due to the convenient system of carrying grenade launcher rounds (5 rounds) and the replacement of the machine gun belt boxes with a pouch with an 800-round machine gun belt feed system. This allows two soldiers from a motorized rifle squad to be assigned to the third element of the squad column, the rear patrol. This third element will provide control of the rear hemisphere during movement, will be able to go to the right and left edges of the forest belt at the beginning of a fight in the forest belt and control the field so that there will be no bypasses and envelopments by the enemy, and when retreating - quickly using pre-prepared ammunition (the fishing line is attached to the grenade check, grenade fuses have been replaced by instantaneous fuses, and there are construction ties for quick attachment of grenades to trees) to set up stretching rods that will prevent the enemy from pursuing on the shoulders of the retreating group. In this case, most of the stretching line is covered even before the withdrawal of their own advance troops, leaving unmined "gates" for passage. The "gates" are closed with stretch bombs at the last moment, after the last retreating soldier has passed through them.

The interviewee also expressed the opinion that the current version's 8-man squad column is too small, as it does not allow for a third element of formation, which is necessary.

A squad column when deployed should form three echelons (lines) rather than one chain.

4. The positioning of combat vehicles in squad/platoon positions envisioned in the Combat Regulations is not applicable in the current circumstances. They will be burned by drones and precision-guided artillery fire before the attack even begins. Therefore, armored vehicles hide in cover behind the defended position and move in when the enemy himself has begun to move his armored vehicles forward to attack our positions. Defending armored vehicles must reach their defended position a little earlier than the enemy can reach it. On the way to the forward position there must be pre-arranged shelters for the armored vehicles. In current practice, when defensive positions are located near populated areas in forest belts, such shelters can be garages and other domestic buildings, which should be reinforced with concrete if possible.

5. When fighting in a forested area, RPGs are difficult to fire because the grenade's plumage can hit tree branches and bushes. The grenade launcher often acts as a rifleman. However, having a grenade launcher with shaped charge grenades is important because it gives the squad at least some means of reacting to the appearance of enemy armored vehicles.

6. To suppress the enemy in the trenches before the final assault, in addition to thermobaric and fragmentation rounds for RPGs, 82-mm mines fired with a grenade launcher are widely used.

7. The statutory method of a single grenade salvo by the assaulting unit, as given in the Combat Manual, is somewhat misleading in training. It is perceived that one grenade must be thrown before entering trench. Under current conditions, many grenades are thrown before entering a trench. The grenades are not thrown by the whole squad, but by one or two soldiers.

8. The statutory method of fixing the duration of the run by distance (8-10 meters (10-12 steps)) is not optimal. It is necessary

set the duration of the run in seconds. This is due to the fact that in dense vegetation (particularly when operating in forested areas) the speed of the run slows down considerably. As a result, the duration of a soldier's exposure to enemy fire can be dangerously long if the running distance is used as a guide.

9. practical safe distance from the burst of an 82 mm mortar mine when lying down is 20 meters. For operations in forest belts, the safe distances for single gun (mortar) firing, which is individually adjusted, must be taken into account rather than those calculated for firing by batteries or divisions. Multiple gun fire is rarely used in such engagements.

10. The interviewee suggested that each soldier needs his own individual drone to replace the RPG-22 and similar systems.

NRICOME 1.

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Tactics and UAVs

New tactical methods and peculiarities of ground forces combat operations, which have emerged due to widespread use of short-range UAVs (range of flight is usually 2 km, up to a maximum of 5-7 km deep into enemy defenses).

1. Preliminary Explanations

1.1. This generalization does not address the impact of medium-range (up to 15 km) and long-range (25 km and beyond) UAVs.

1.2. The question of the reasons for abandoning maneuver forms of combat (deep combat/operations) and moving to small and super-small group tactics (4-15 men), similar to interwar group tactics, is not addressed in this synthesis. The prior use of UAVs is one reason, but not the only reason.

2. New tactical elements and observations.

2.1. UAVs and the actions of other units.

2. 1.1. Deployment by accumulation

Advance to the initial attack position is NOT accomplished by successive deployment from columns of units of decreasing level according to assigned lines, but by gradual, stealthy accumulation in small batches. Ammunition and personnel resupply and casualty removal are carried out in a similar manner. For logistics purposes, vehicles are usually used one at a time. In some cases, ammunition is carried to artillery systems and to nearby depots by single soldiers manually or using handcarts/motorblocks that do not leave marks on the ground.

Movement in the accumulation zone toward or away from the leading edge involves a risk of enemy defeat equal to or greater than that at the leading edge. If the "old" statutory tactics focused on suppressing the enemy while moving to the attack, the "new" tactics require that the issue of suppressing the enemy while moving to the initial line (leading edge) from deep inside the defense be addressed.

It should be taken into account that the range of UAVs in defense-in-depth is gradually expanding due to technical changes.

2.1.2. Using a "carousel" UAV to support an infantry attack.

Organizing support by UAV strikes (kamikaze and/or drop UAVs) in such a way as to achieve the effect of the artillery tactic of "pressed against the bursts of their shells/firewall" has certain difficulties. Keeping the enemy suppressed in defensive positions with constant UAV strikes is difficult due to technical, economic, and production constraints:

- the operator must accompany the UAV flight all the way to the point of impact, which takes 5 minutes or more per sortie (taking into account flight preparation time, the maximum strike rate for one UAV operator is 1 strike per 6 minutes for kamikaze UAVs and 1 strike per 12 minutes for jettisoned reentry UAVs).

NOTE 1. There is a pattern of use where drones are handed to forward units which bring them close to the attacked position. The assault infantry, having reached the initial position, which is 100-150, in some cases up to 50 meters from the enemy trenches being stormed, deploys the attack drones they brought with them on the ground and activates them. The drones are prepared by the UAV service in such a way that they can be made operational as easily as possible in a single action. Not all attack drones are familiar with the launch procedures provided by manufacturers. Location

The drone deployment sites should not be in the radio shadow, so that external UAV pilots can connect to (activate) them from a distance, from their positions in the depths. It is desirable to agree on the locations of the drone deployment in advance, so that the pilots do not waste time on orientation and understand where they are before take-off. External UAV pilots use directional antennas. They remotely activate them from a safe location, sometimes several kilometers away from where the drones are deployed. The drones then start hitting the attacked positions. Because the sub-light distance is very short, this has the effect of suppressing the positions. The bursts from the drone strikes follow with minimal time intervals between them. This allows the attacking infantry to get as close to the attacked positions as possible. The assault team can carry up to 25 drones for deployment on the ground.

When using this scheme, it should be taken into account that video signals from FPGA drones that are close to each other may interfere with each other.

A strike UAV can land on the roof of a dugout or building where the enemy is sheltering and wait for further command. The observation UAV determines when the enemy leaves cover and strikes. The flight time of the strike UAV is only a few seconds.

NOTE 2. The use of industrially manufactured fuzes for FPV drones, kamikazes, accelerates pre-positioning and, consequently, the speed of UAV crews' response to requests from the units they support.

—a set of kamikaze UAVs with analog video transmission system when clustered in relative proximity to each other

The number of such UAVs in one location is not expected to exceed 6-8. The notional maximum number of such UAVs in one place is 6-8 units.

When organizing an array on the same terrain, the calculators need to agree on the polarity frequencies so that they do not interfere with each other. There may be a queue for the use of the frequencies. In some cases, the frequencies have to be held back so that other calculations do not occupy them;

- A separate pilot is required for each UAV and, in the case of UAVs with drops, often also a payload operator. The pilot must be accompanied by a technician who monitors the operation of the transmission equipment. There may also be a helper who hangs the drones, activates and monitors the launch of the drones, sets them up on takeoff pads, and fixes mechanical problems on the ground. The number of trained pilots, operators, and technicians is limited;

- Returning ditching UAVs have a number of individual characteristics (battery consumption, firmware, pilot/operator training) that make it difficult to calculate consecutive strikes at approximately equal intervals;

- In some cases, competitive excitement among UAV pilots/operators prevents them from organizing a queue of strikes when there are several drones in the air at the same time over the same area. The pilot/operator tends to strike before the others in order to hit the target and ensure that his or her sortie is not futile, guaranteeing effectiveness. From this point of view, it is more convenient to use UAV pilots in pairs.

Technical and organizational development can change the situation, but for now it is.

The following methods are used to escort an attack by UAV strikes.

A. Inculcating drone warfare. Through systematic and sustained UAV strikes over a long period of time, warfighters begin to hide from the sound of UAVs and do not leave cover for long periods of time. Drones can usually be heard but not seen. Without specialized equipment, they are difficult to detect. If the enemy

If the UAVs are accustomed to fearing drones, then a UAV "carousel," i.e., the sequential replacement of one strike UAV by another, can have the effect of suppressing positions despite significant time gaps between strikes.

B. Infantry jerk attack. During UAV strikes against an attack objective, the attacking infantry moves closer to the objective. After the strikes are completed, the infantry takes cover and waits for the next wave of UAVs to approach or continues to move, but out of sight of the defenders. This is repeated several times until the infantry is in close proximity to the attacked position.

B. A mixed "carousel" of surveillance UAVs and strike UAVs. One or more surveillance UAVs observe the target (surveillance UAVs may be used alternately - one takes off and one lands to ensure continuity of observation).

Strike UAVs (drop UAVs and kakaze UAVs can be combined) fly to an area close to the target in advance, land on the ground or more often on buildings (gas stations, bus stops, etc.) and stay in standby mode. Note that when landing on the ground, there is a risk that the drone may fall into the radio shadow zone. Hovering in the air is an option, but hovering consumes battery power faster than standby on the ground. When the UAV detects a target on the object under attack, it takes off and strikes. After several ultra-fast strikes on the defenders (the time interval between the appearance of the defending soldier in the trench and the strike is very short), they are afraid to come out of hiding. This allows the next wave of UAVs to reach waiting positions for follow-on strikes and helps the attacking infantry get closer to the target.

Г. Under the cover of the initial massive kamikaze UAV attack, several strike UAVs are deployed in close proximity to the attacked position, including in the immediate rear. After the main raid is completed, the operators of the deployed UAVs wait for the troops to emerge from cover after the initial raid. Deployed drones conduct

The short-range strike against such soldiers. This achieves the effect indicated in letter c).

Д. UAV raids (both kamikaze and drop attacks) are used to divert the attention of the defender from approaching attack groups. When a UAV raid occurs, the defender is either too busy firing at the UAV or hiding in cover, causing the approach to the defended position to be obscured. The enemy may use a combination of artillery preparation on some positions and simultaneous UAV strikes on others as part of a single offensive plan.

NOTE. The prevalence of foot traffic in forested areas during attacks, in particular, is due to the fact that even artillery-affected trees create a lot of visual obstruction to the UAV operator's aim. Such remnants of forested areas provide a chaotic backdrop of branches covering the ground, which makes it easier to hide against. From at least two directions (front and rear) along the forest belt, targets are not visible at all. In forest belts, it is also possible to use the clinging to trees (without putting your arms out to the sides) to counter UAV thermal imaging. In forested areas, you can choose a position under a tree to give the UAV a better chance of dropping the munition on branches and bouncing off to the side.

2.1.3. Accompanying the actions of individual soldiers for cleaning trenches, buildings

A. The transition to small and super-small group tactics allows for adjustments to individual Soldiers. A trench sweep team normally consists of 3-5 men. If a UAV is available to guide the assault, three men are sufficient to clear the trench. No. 5 in the assault team is, if available, a corpsman. The observation UAV is used to correct grenade throwing,

The choice of a trench branch for movement is indicated, the presence of the enemy in certain rooms in buildings is reported, the use of the simplest tactical combinations is indicated, etc.

This use requires certain control skills on the part of the observer, as troops on the ground do not see what the UAV observer sees. The moment the escorting UAV leaves to recharge, the assault is halted until the UAV returns/replaces the UAV at the observation position, unless a "carousel" of observation can be organized, i.e., the observer UAV is replaced by another vehicle.

When accompanying assaults with UAVs through individual soldier coordination, recognize that the UAVs accompanying the assault will have to be replaced due to battery drain. If the number of UAVs is insufficient, it may be necessary to use drones from neighboring (adjacent) units to maintain a "carousel" of continuous observation of the assault. In this case, information will be relayed by the UAV operator, most often through the staff officer, rather than directly to the assaulting soldiers. This leads to delays and certain distortions in the transmission of information. The fact that the assault unit commander and the staff officer, tuned to the same frequency, hear the same information from the drone operator simplifies the situation somewhat, but does not completely eliminate the problem.

B. Infantry maneuvers on the battlefield can be guided by a UAV flying in front of the unit to indicate where to go. Such a team is usually accompanied by strike UAVs. A UAV used for navigation is not used for strike purposes. If several groups operate simultaneously, each group is accompanied by a navigation UAV. This is especially useful when using poorly trained personnel in combat .

B. Given that both sides of the conflict use the same UAV models, it is extremely difficult for military personnel to determine whether a UAV is passing by their own or another's. In the dark, they try to use different combinations of UAV lights to avoid firing at their own vehicles.

Г. When mopping up a trench, it is desirable to have a headset, which is used by the security services. The information coming over the radio from the UAV operator who accompanies the sweep is audible not only to our attack aircraft, but also to enemy soldiers.

Д. UAVs track soldiers moving in forested areas in the most sparse areas of the forested area. The UAV hovers at a high altitude in a location that allows observation of an open (sparse) section of the forest belt. If the UAV detects moving soldiers entering the open area, it descends to strike.

2.1.4. Minefield reconnaissance and mine clearance.

Given that the mass of mines are laid on the surface of the ground (deminers are often unable to work for long periods of time and bury mines due to the use of thermal imaging devices by the enemy), UAVs from the air record their exact location. In particular, the effect of the difference in the cooling rate of metal and ground in the evening is used in the presence of thermal imaging cameras on UAVs. This makes it possible to detect the leading edge of the minefield and determine its depth. Complete predictability of the minefield location for the enemy to within a meter (and the possibility of communicating this information to the lower units with the help of electronic devices) can really affect the tactics. Minefields are stopped not only by physical impact, but also to a large extent by fear of the unknown. Soldiers are afraid to move where they might be hit by a mine. The use of UAVs can alleviate the fear of the unknown.

In some cases, it is possible to detonate some mines with overhead charges launched from UAVs.

If our engineers are detected laying a minefield, the enemy may not engage them with fire, but rather observe and record the locations of the mines with UAVs. Thus, the position of the minefield is fully determined. Then a concentrated artillery strike was made on the minefield to make the passages. Given that the depth of the minefield is usually not very deep, the enemy does not need to fire a very large amount of artillery at the minefield.

a section of terrain. Mines do not normally detonate, but are dispersed because they are placed on the surface.

2.1.5. Field fortification against the risk of UAV strikes. A. In view of the possibility of UAV drops and free-fall ammunition falling directly in front of the entrance, underbelly recesses should be L-shaped or lightning-shaped rather than a simple rectangular shape. A short roof over the top of the section of the trench into which the underbelly recess extends is desirable but not sufficient to provide cover for personnel. Free-falling munitions dropped from UAVs can hit very accurately under the very cut of the cover, hitting personnel in the simple rectangular . Kamikaze UAVs can fly underneath the slab.

B. To counter the threat posed by UAV drops, fully covered forward firing cells are used, not only covering the soldier's position but also the trench to which the cell is adjacent. A UAV drop that hits near the entrance to the covered area does not hit the enemy in the cell, as it is around corner in the cell itself.

It is desirable to overlap the length of the trenches on the squad and above by about half from above. In practice, there are cases where the trenches are completely covered, leaving only ammunition for firing (in attached or outrigger cells connected to the emplacement trenches). It should be understood that a complete overlap of a trench creates very great difficulties in defensive combat against attacking infantry. Given the almost complete refusal of frontal attacks by infantry on both sides*, the pre-prepared embrasures often look in the wrong direction. Artillery preparation collapses some of the slabs, which prevents movement inside the trench. Maintaining maneuverable antipersonnel capabilities by relying on trenches is as important as protection from UAVs. A compromise solution must be used. Covering the trenches solidly creates the conditions for maintaining a higher temperature in the trench, which can lead to better thermal isolation (see below). Infantry Combat Tactics in an Overlapped Trench

differs from combat in an open trench (blocking of the defenders in a "tunnel" is possible, including running across the terrain to the far entrance reduces the convenience of using grenades and the number of convenient shooting positions).

In the absence of materials for rigid covering of trenches, materials such as fence mesh or conventional camouflage nets are used. They make it more difficult for the enemy to detect targets and somewhat lessen the impact of a munition burst, which occurs overhead rather than on the ground. In some cases, dropped munitions bounce or kamikaze UAVs get caught in the nets. Fishing, volleyball and bird netting are sometimes used as improvised materials. Nets do not protect against heavy munitions dropped from agrodrones (mines, RPG rounds). In the absence of artificial materials to counter grenade and VOG drops from UAVs, trenches are piled on top of trenches with a pile of branches. As a result, the grenade or HEAT is likely to bounce outside the trench, making it more difficult for UAV operators to locate the trench.

* NOTE. Attacks are conducted practically exclusively by two methods: a) stealthy accumulation at the initial line of the small group, a short fire attack on the attacked position and a slow sneaking approach of the maneuvering sub-team to the flank of the enemy trench (the so-called "crawl" attack); b) a fire attack on the attacked position during which 1-2 BMPs move in close to the enemy trench (the so-called "crawl" attack); b) a fire attack on the attacked position during which 1-2 BMPs move out directly.b) a fire attack on the attacked position, during which 1-2 BMPs move in close proximity to the position 10-20 meters) and land an infantry troop in a narrow area of penetration, while the troop clears the trench from inside to outside.

B. Due to the potency of munitions (mortars, anti-tank mines, RPG rounds) that can be carried by heavy UAVs and used against

fortifications, the heat signature created by heated dugouts should be taken into account when constructing dugouts for personnel accommodation.

the ground above the dugout on the thermal imaging screen. It is required to use heat-insulating materials when constructing dugout ceilings. In this case, it is undesirable to use bourgeois stoves, but it is desirable to use domestic gas heaters for dugouts.

Г. The embrasures are covered with metal nets with small holes for the machine gun barrel. This is to prevent kamikaze UAVs from entering the embrasures. The entrances are covered with mosquito nets with weights.

Д. During offensive halts, positions are established not on the basis of tactical expediency, but where basements and similar shelters are available, taking into account the possibility of concealment from UAV strikes. The size of the positions can vary from squad, platoon, company and battalion positions. Бс depends on the ease of retrofitting and utilization. As a result, a defense consists of multiple positions spread across the front and in depth, varying in size and firepower.

Е. Machine guns and grenade launchers should be stowed in underbelly recesses, except when firing from them. They are very conspicuous when viewed from UAVs.

Ж. In forest belts and wooded areas, areas can be set up tightly covered with anti-drone nets. It is not possible to cover most positions with nets. Too many nets would be required. However, individual zones (parts of positions) can be closed. They can serve as shelters where personnel can flee to when attack drones begin to attack.

3. When an FPV drone flies into a building corridor or a room or a field tunnel, it loses signal at some point. Therefore, it can only hit at a shallow depth within a volume.

2.1.6. A fire attack on positions abandoned by one's own troops. A fairly widespread and long-standing technique is the artillery strike on pre-shot positions immediately after the enemy has occupied them. Such strikes are often effective; it is extremely difficult to train troops not to occupy ready-made trenches dug by the enemy.

In some cases an immediate raid on one's abandoned positions makes it possible to counterattack successfully.

to be destroyed. Nowadays, defenses are prepared for immediate UAV strikes after the infantry has abandoned their positions. Unlike artillery strikes, the mere unoccupation of an enemy trench by the attacking infantry does not significantly reduce the effectiveness of such a strike.

2.1.7. Facilitating "counter-pressure against projectile fragments". One of the problems with an attacker's use of counter-

One solution to this problem is the use of UAVs to observe from the side and above outside the firing zone. One solution to this problem is the use of UAVs that conduct side-to-side surveillance outside the firing zone. Ideally, at the command of an external observer, fire should be initiated from outlying bullets (e.g., from neighboring forest belts), sweeping the terrain directly in front of the trench under attack, as well as the exit from cover.

2.1.8. Supply UAV

A. Isolated forward positions can be supplied with large UAVs (agrodrones), reducing the need for rotations, which very often result in the loss of personnel and equipment.

A challenge for this supply is the vulnerability of the departure point. Sooner or later, if you fly out from one point on a regular basis, and due to the limited payload capacity of the drones you have to fly out a lot, it will be detected and fired upon by the enemy. The loaded agrodrones should preferably be transported from the storage area by vehicle and lifted off to the side.

B. Experience has shown that forward units that are about 4 kilometers away in an open area with no forest belts are isolated. Any movement away from or towards forward positions triggers intense drone attacks. As a result, rotations and the carrying of supplies, even by lone soldiers, are impossible. Water bottles and candy bars are the only way supplies are dropped to forward units by drones.

2.1.9. The use of UAVs to follow the fire of artillery and tanks firing from closed positions.

A. Reconnaissance of targets for counter-battery warfare

Once the approximate location of an enemy gun (single tank) has been determined by sound detection, a UAV is sent there to pinpoint the exact location of the gun. Since counter-battery warfare nowadays is conducted not against area targets but against point targets (guns are always located one at a time), precise coordinates are required and artillery corrections are desirable. Another option for using UAVs for the same purpose is to have UAVs on airborne duty to visually detect enemy artillery emplacements. After this detection, the drones fly to the approximate location of an enemy gun to determine its exact location.

B. Artillery UAVs and infantry applications.

It is not uncommon for artillery units to take their UAVs into the air after receiving a report that infantry units have detected a target in order to make their own fire adjustments. Infantry units can often provide only an approximate location of the target and are not able to correct artillery fire properly. Unfortunately, during the time the UAVs of artillery units reach the zone designated by the infantry, maneuvering targets (e.g., roaming enemy tanks) have time to complete their fire mission and leave. Given the remote location of artillery units from the line of contact, it can be organizationally inconvenient for them to keep their UAV teams in forward positions. This makes it difficult for artillery UAVs to pick up corrections from infantry vehicles. Artillery supervisors have noted instances of clearly untargeted requests from infantry units, causing artillery units to distrust infantry requests and, as a result, seek to double-check them in-house.

B. Alternation of surveillance zones during artillery corrections.

When using UAVs in the area of effect of a relatively low-
The following scheme of interaction with tanks firing from closed firing positions was used when the possibility of transmitting a signal to their UAV is preserved, but the UAV is uncontrollably shifted away from the wind. After

The UAV camera was directed downward for the duration of the tank shell flight (14 seconds) to keep the UAV at the desired point on the terrain pattern. A few seconds before the expected arrival of the projectile, the UAV camera was raised to observe the area of the expected arrival of the tank projectile. After the correction was transmitted, the camera was lowered again to hold the UAV in place by monitoring the terrain pattern.

The need to control the UAV's location is not always understood. For a number of reasons, surveillance UAVs operate with virtually no automatic stabilization (stabilization by satellites is disabled, it is possible only by sensors of the drones themselves). This means that in the presence of wind at altitude, which is almost always present, surveillance UAVs are strongly drifted. The drift can reach 10 or more meters per second (600 meters in one minute), which means that it can become significant in a relatively short time. The drift must be compensated for manually. It can be difficult to see the drift immediately, especially when observing at dusk or when observing at close range. It can take an operator 30 seconds or more to realize that a drift is occurring. Under unfavorable conditions, this can lead to the loss of the vehicle. Therefore, when correcting artillery (tank) fire, the UAV operator should alternate between observing the approximate area of incoming shells and observing the terrain below the vehicle, which allows him to determine his location. At the high rate of artillery fire, if there is a requirement to report on each arrival, the operator simply does not have time to correct the position of the downwind vehicle, which again may result in its loss. It should be understood that when correcting UAV firing, it cannot be non-stop; pauses are required to re-establish the drone's position in space.

There are situations when the HQ officer realizes that the drone is in ace mode (i.e., without stabilization, when the drone does not hold itself in one place by using sensors to compensate for the effects of wind) and the pilot is checking his position too often, moving the camera away from the observed position, then the command may be followed.

The UAV should be operated by two people: one pilot who controls and a second pilot (operator) who observes and corrects. Ideally, there should be two people working with the UAV: one pilot who controls the drone and a second pilot (operator) who monitors and adjusts. To mitigate the problem of uncontrolled UAV drift, the first flight of the day is a setup flight to understand weather conditions, especially wind, and to find an echelon (altitude) where the wind is relatively moderate.

The wind can change during the day, other peculiarities may come up, pilots need to learn day and night routes, memorize a new map of the area, so it takes 2-3 days for the UAV crew to get into effective operation at a new location. The practice of outbound flights helps, when a new pilot flies with the old pilot as a co-pilot and listens to his comments.

Г. Distribution of the means of defeat.

When both drones and artillery systems are operating simultaneously against the enemy, kamikaze drones are used primarily to engage maneuvering targets, while artillery systems are used to fire on static targets.

Д. The compensatory role of the UAV system.

A. In the event of a shortage of ammunition or a successful enemy counter-battery fight, the reduction in artillery firepower can be compensated for by the massive use of UAVs. In this case, the UAVs take over most of the tasks normally performed by the artillery. With up to six kamikaze drones simultaneously attacking a single target, evasion is virtually impossible. You can evade one, up to a maximum of 2 drones. 3 drones attacking a target will result in a guaranteed hit.

B. The tactical pattern of artillery use has changed. At the beginning of the war, the main emphasis was on linking surveillance UAVs with artillery fire, which was the main casualty infliction. Now, instead of inflicting major casualties, the main task of artillery is to restrain the maneuver, pin the enemy to the ground, and prevent him from moving. The main tasks of inflicting casualties on such a constrained enemy are performed by attack

UAVs.

2.1.10. UAVs and air defense.

A. The long request shoulder for air defense operations via the control pi-mid leads to ineffective air defense operations against heavy enemy aircraft-type UAVs. Air defense assets are normally kept off to avoid enemy detection. They are turned on only after observers report an enemy UAV overflight. If there are multiple control stakes, considerable time is lost in transmitting the request, during which time the UAVs fly out of the air defense range. Infantry soldiers believe that the right to report UAV overflights directly to the air defense squad would be desirable, at least at the level of the motorized rifle company commander.

B. In early January 2023 (kamikaze UAVs were not used en masse, but drop drones were used), the counter-drone defense of a rural settlement was organized as follows. The village had a roughly rectangular shape. Observation posts were set up at the corners and in the middle of each side of the rectangular border of the settlement. Two men were on duty there at all times. The total composition of the post was 8 men. The twos were rotated periodically. UAVs were usually detected by sound. Then a signal was transmitted by radio about the approach of the UAV and the direction of its approach relative to the observation posts. Anyone who heard the radio message would join in the small arms fire on the drones. In practice, the UAV was fired at from at least four sides. Fully loaded tracer magazines, ideally with 45 rounds of RPK ammunition, were used to increase the probability of hits. The UAVs were shot down at an altitude of about 20-30 meters at the same horizontal range. Initially, the enemy tried to discourage this practice with increased mortar fire, but was unsuccessful. After about 1.5-2 weeks, the UAVs began to fly around the side of the settlement along the edge of the wooded strips that flanked the fields surrounding the settlement.

B. A team of 4 soldiers armed with anti-drone rifles, assault rifles and 12-gauge shotguns loaded with two-zero shot is used to destroy enemy UAVs

(buckshot). Typically, two soldiers hold the enemy UAV with anti-drone guns (one device is a "saw", the other is a different modal), while the other two soldiers fire either a) automatic rifles with precision devices, such as collimator sights, at Mavic UAVs that fly relatively high, or b) shotguns at FPV UAVs that fly relatively low. The actual engagement ranges are 50-150 meters.

Г. When firing at small UAVs, there is a difference of opinion as to which mode of fire is most effective. Some say that single-target fire is the most advantageous mode of fire. Automatic fire has poor results. Others say automatic, including tracers. Some say that assault rifles are not very accurate against drones and that RPKs have been used for this purpose.

In general, the effectiveness of small arms fire against UAVs is assessed as high, with 70-80% of the UAVs fired at being hit. They try to use precision sights, but often have to use standard mechanical sights. Collimator sights are effective during the day and thermal sights at night. Problems are encountered in engaging surveillance UAVs that hover high in the air. They can be heard but not seen.

There have been cases of homemade racks for firing at UAVs. The installation of fixed air observation posts (AOP) with heavy machine guns and small caliber anti-aircraft guns has not proved its worth. Such posts are detected by the enemy and purposefully knocked out. The maneuverability of UAV firepower is important. In particular, troops are using the installation of a DShK machine gun on the UAZ chassis to fire at high-altitude UAVs.

Д. One of the problems in the organization of interoperability, including the organization of the fight against enemy UAVs, is the intermingling of units. In a relatively small area there may be up to 15 units with different lines of command. In particular, this is due to the need to be stationed in a

in populated areas and small forested areas, when small groups of soldiers from different units form a "puff-pig" of intermingled soldiers. As a rule, in such cases, no commander takes responsibility for organizing interoperability. Units exist independently of each other, even though they are close to each other. The situation is more complicated if units use different types of radios.

FROM THE ORIGINATOR. In such situations, the standard rules for assigning responsibility for establishing communication and organizing interaction in the absence of a separate order do not work (by default: for communication along the front, responsibility is assigned to the right neighbor; for communication from troops in the rear to troops in front, responsibility is assigned the headquarters of the unit in the rear). They are designed for a linear arrangement of the front, but in reality the troops are mixed up. A different algorithm is needed to assign responsibility for coordination to the commander of one of the units.

2.1.11. Replacing foot reconnaissance

Foot reconnaissance behind enemy lines has been phased out. A combination of new technical means (UAVs, surveillance cameras, motion sensors) has made crossing the front line impossible. It is being replaced by UAV reconnaissance flights.

2.1.12. UAVs and management.

A. The use of UAVs to observe the battlefield from depth leads in some cases to micromanagement by senior commanders. Commanders at the Army level and above are involved in the battle management of individual platoons (targeting individual low value targets). This leads in some cases to erroneous prioritization of targets and artillery resources allocated to engage those targets.

B. The use of surveillance quadcopters by commanders in organizing and escorting attacks results in insufficient

The battlefield commander has a clear view of the battlefield, but the soldiers on the ground do not see what the commander sees from above. The commander has a clear view of the battlefield, while the soldiers on the ground do not see what the commander sees from above. The commander often assumes that the soldiers have the same level of situational awareness as the commander, which is often not the case.

B. In certain circumstances, it is advisable to post live streams of their UAV flights on Google Maps. That is, not only the operator and commander, but also any soldier with access to the Internet can monitor the flight. This is done for better situational awareness of soldiers.

Г. The creation of full-time UAV platoons and centralized distribution of UAVs results in infantry platoons not receiving UAVs, which makes it very difficult for them to perform their missions. On the other hand, the distribution of UAVs to lower-level units can lead to ineffective use due to poorly trained in the use and maintenance of the vehicles. In the face of a quantitative shortage of vehicles, finding a balanced solution to the problem is difficult.

2.1.13. UAVs and REB/RER.

A. If the adversary turns on the radar, it may be a sign that they themselves are not using UAVs. Conversely, during the period of attack, EWRs are not used to allow their UAVs to fly. However, one cannot rely entirely on this sign. The UAVs may be operating on some frequencies, but they may be operating on others.

It should be taken into account that the problem of suppressing the REB of one's own drones is solved by a REB-free device. The "corridors" through which their drones can fly to enemy positions. The corridors are often spontaneous. After some time at the front, a newly arrived UAV team begins to realize where its own troops are using REB and where they are not. As a rule, less valuable drones are used to probe corridors in order to minimize the negative consequences of losing a drone.

To create corridors in their fields, the REB uses

general chat in one of the messengers. The Internet for the chat room is obtained as best they can (Tricolor, Starlink, various amplifiers). The main task is to find a chat administrator who is sufficiently authoritative in army circles and who verifies people when they connect to the chat. In particular, the chat administrator was a responsible member of the special services. It is not easy to use a general chat room, as it is necessary to allocate military personnel who monitor the messages in the chat room. The chat itself is not self-sufficient. The main problems in using the chat room are: the lack of a unified grid of coordinates, which makes it very difficult to be geo-referenced; and the optional nature of chat messages. Information may not be posted or may be posted late and deemed unimportant.

B. RER systems are usually able to locate the UAV's control panel, but given the high saturation of electronic devices on the front, it is impossible to fire at every device emitting a radio signal. That is why the enemy's attention and fire are attracted by devices that stand out in some way from the main mass in terms of emitted signal. In particular, when new equipment arrives that differs in its parameters from those previously used in a given area, the enemy can organize fire against it.

2.1.14. The effect on the tactics of "roaming" .

The constant surveillance by UAVs has reduced the effectiveness of nomadic firepower tactics. Detecting a firearm in a new position is less difficult than before.

2.1.15. UAV system in defense.

Without "lower sky" control (suppression of enemy UAV activity), infantry advances are often impossible. The defender brings the advancing infantry units close to him, then cuts them off with UAVs on duty, and then methodically knocks out the advancing troops with drone and artillery strikes.

2.2. UAV autonomous actions.

2.2.1. The use of UAVs in "free hunting" mode, not linked to the actions of other troops.

In typical situation, a mobile team travels to a position convenient for launching UAVs in a pickup truck. Many UAVs of different types (kamikaze, jettison, surveillance, transponder) are loaded in the back of the vehicle. A team of two to three soldiers moves in the vehicle. UAV sorties are usually conducted in pairs (observation UAV+ kamikaze/release ; two kamikaze UAVs). The use of two UAVs can significantly increase the probability of hitting the target. When the kamikaze UAVs or charges are exhausted, the mobile team leaves the position.

Of course, the "free hunt" mode can also be used chaotically, in a "tactics without tactics" mode. In this case, sorties are carried out when ready.

In general, effect of UAV "free hunting" is similar to the effect of "sniper terror" tactics.

It should be understood that it is relatively safe to fire 4-8 drones from a single point. The drone has a significant flight time, which gives the enemy the opportunity to realize that it is being fired upon and begin actively searching for the formation. Then the enemy is very likely to detect the formation and start firing at it.

In order to prevent the enemy from tracking the UAV's landing site upon return from a flight, the return route is routed through a forested area, over some established footpath, or, for experienced pilots, simply through the forest. Knowing the trails, flying along them is easy, and the enemy loses the pursuing vehicle in the foliage.

UAV sorties from high-rise buildings are conducted through a window located on the opposite side of the house from the enemy.

2.2.2. The use of UAV ambushes in the rear area.

Strike UAVs arrive in advance in an area close to the possible routes of supply vehicles or tanks firing in short roll-out mode, land on the surface of the ground or buildings and standby. When the UAV detects a target on the object under attack, it takes off and strikes.

A similar landing pattern in the rear is used for observation and waiting out the time of operation of REB systems.

A similar application scheme is to organize an ambush of multiple drones, when it is possible to bring and deploy drones on the ground behind enemy lines, e.g. with the help of a DRG or sympathetic locals. It is important to choose a location so that the UAV operators can technically connect to the UAV remotely (the drone deployment site is not in the radio shadow).

Hovering or patrolling typical airborne supply routes (particularly with kamikaze UAVs) is an option, but hovering or barraging uses up battery power faster than waiting on the ground or on buildings. When a kamikaze UAV's batteries are running low, they are diverted to alternate targets. This method is used when the UAV is sufficiently stocked, i.e., when the probability of an unsuccessful flight is considered acceptable given the importance of cutting off an enemy supply route.

Given the weak ability of kamikaze UAVs to identify targets, their activities are often preceded by surveillance UAVs.

For the reasons mentioned above, it is typical to use kamikaze UAVs in pairs. After the first strike, a second strike on the same target is to be expected.

Note 1: It is possible to use UAV remote mine-laying by placing PTM-3 mines in the rear.

Note 2: Heavy Agrodrones are used to deliver and deploy strike drones on the ground in rear areas. UAV operators then engage and strike from afar.

2.2.3. Infiltration of heavy UAVs (Baba Yaga-type agrodrones) deep into defenses for bombing raids.

Given the relatively large size and high noise of large UAVs (Baba Yaga-type agrodrones), and the relative ease with which they can be detected and destroyed by small arms fire, the infiltration route to the target is built low along the ground (below the level of the treetops) along unobserved defensive routes.

Often they fly along roads, sometimes tailing our vehicles as they move along the road (nets can be stretched along the road to prevent them from flying). UAVs may follow vehicles leaving front for a , with the expectation that they will lead the operator to a place of shelter, ammunition, fuel storage, etc. In addition to hitting the detected equipment, this is a way of identifying targets for subsequent strikes.

The UAVs may fly across the line of contact away from the target, or they may approach the target from behind our troops. Often the flight of such UAVs is covered by one or two strike UAVs to counter ambush parties waiting for heavy UAVs to appear at real or specially created imaginary targets. The arrival of heavy UAVs is preceded by a flight of surveillance UAVs to reconnoiter the route and target of the attack. Under current conditions, surveillance devices on agrodrones are far inferior to those of small UAVs. Large UAVs are used primarily at night.

NOTE 1. When using a drone of the type
The "Baba Yaga" is flanked by the "Granddaughter", a lighter drone with a drop. After the Baba Yaga defeats a position, the Granddaughter hovers over the defeated position, not allowing the wounded to be carried out.

NOTE 2. To ensure the passage of a group of 5-6 drones to the rear over the forward defensive positions in the forest belt, 12, 7 mm or 7, 62 mm large-caliber machine guns are used to fire on these positions. This fire prevents drones flying overhead from opening fire.

2.2.4. Using UAVs as a frontline surveillance camera. In some cases, UAVs are manually placed in the rear on trees, as well as planted on structures or even the ground for use as a temporary surveillance camera. At the moment, there is no surveillance camera coverage.

a significant portion of the length of the line of contact. In the event of a fixed camera failure or the need to cover an area not equipped with cameras, UAVs are used.

2.2.5. Use of UAVs as an air defense tool

A. The following approach is used as a countermeasures technique against heavy drop UAVs (Baba Yaga-type agrodrones): surveillance UAVs with thermal imaging cameras (agrodrones are used primarily at night) are flown at relatively high altitudes and control the surveillance sectors assigned to them. When the Baba Yaga passes overhead, the air defense UAV lands on top of the Baba Yaga. In a UAV collision, both UAVs hit the ground, but usually suffer minor damage and remain repairable. As a rule, only the blades and the beams carrying them are broken. Of course, when picking up downed enemy UAVs, it should be remembered that they may be booby-trapped and laced with poison. When using a similar technique ("dive" from above) against a flying-wing UAV, there is a problem in that quadcopters cannot make fast maneuvers. They change direction and altitude relatively smoothly. A flying wing UAV begins to maneuver actively when its operator is informed that an enemy drone is approaching it.

Attempts were made to hit the Baba Yaga UAV with a Mavik-type UAV. This did not work. The target kept moving away.

B. One method of countering an adversary's quadcopter is to intercept it with a UAV equipped with an approximately 1 m by 1.5 m grid attached to a rail. The net is suspended vertically. At the moment of capturing an enemy quadcopter, the UAV interceptor operator must release the rail so that it falls and the enemy vehicle does not pull the UAV interceptor. There are proposals to suspend a rope with a weight on the UAV so that it becomes entangled in the propeller of the enemy UAV.

The main problem with this and a number of other ways to combat enemy quadcopters is the lack of a unified system

It is also important to have a system of warning, especially a system of landmarks (squares) against which soldiers in units in of enemy UAVs can alert other units as to where the enemy UAVs have been detected and where they are headed. Low-Sky Air Defense's biggest challenge is warning and targeting, not destroying enemy UAVs per se.

2.2.6. UAV photo reconnaissance.

UAV reconnaissance is conducted not only through direct observation, but also by photographing views of the terrain and then comparing them to identify changes over time. Activities should minimize changes to the appearance of the terrain, especially the camouflage of debris.

2.2.7. Countering REB in other ways.

A. As a rule, the beginning of the enemy's REB operation against a controlled UAV can be understood by the UAV's behavior (deterioration of image quality, yawing of the received image up and down, etc.). If you catch this moment, you can make an anti-RAB maneuver in time. An example of such a maneuver is a departure from an operational altitude of 200-300 meters to an altitude of 80 meters. If this does not work, the UAV can be lowered to 2 meters and brought to the desired area at this height. As a rule, when the UAV is lowered to a height of 2 meters, the suppression of the enemy's REB signal ends.

Alternatively, in case the drone loses control due to enemy REB, the control programs program the drone to ascend to altitude instead of descending to the ground. At altitude, the effectiveness of the REB means decreases, allowing the drone to regain control and not lose the drone.

Close to the ground, there is a risk of losing contact with the drone due to the terrain (drone entering the radio shadow zone).

B. It is standard practice to take the UAV into the sky a few hundred meters from the launch point after the vehicle has entered the ascent point at a low altitude of a few meters to avoid enemy detection of the operator's location.

B. If the UAV byanti-drone gun and hovered in one location, enemy artillery will fire at the UAV's forced hover location. The enemy rightly assumes that the anti-drone gun crew and the soldiers trying to shoot down the immobilized drone with assault rifles are relatively close to the hover site and are standing at full height in the open. There is a chance of hitting them. This tactic has the effect of creating soldiers who do not come out of hiding to fire at the immobilized UAV.

Г. It is necessary to systematically monitor the signal strength, a drop in which may indicate the enemy's use of REB. If the functions of UAV pilot and UAV operator are combined in one soldier, it is possible to miss the onset of enemy EOD.

2.2.8. Drone Minimization.

Since the drone may contain a mine that reacts to metallic objects, it is dangerous to use a metal cat to dislodge a downed drone. Long wooden poles of about 5 meters in length are used to push the downed drone out of the way.

2.2.9. Armored vehicle attack.

The standard sequence of UAV attacks on tanks is a sequence of immobilization strikes (on the tracks, in the power compartment) followed by UAV strikes (both FPV and drops). After immobilization, the crews leave the tanks.

2.2.10. Extending the radius of action of drones with transponders. Heavy agrodrones can be used as aerial vehicles. current for FPV drones. Such an agrodrome simultaneously acts as a repeater. This makes it possible to use FPG drones deep in the defense at a distance of up to 30 km behind the front line.

2.2.11. UAVs as an intelligence asset.

Detection of increased UAV concentrations above the normal level (5-6 in the line of sight) is a reconnaissance sign of either an enemy offensive preparation or an enemy unit rotation.

NRICOME 2.

Результаты тактического эксперимента по применению полевой фортификации в обороне, проводившегося в период с 14-15.10.2023

Key findings

1. Static firing from small arms cells is practically not used by the defenders. The defense is conducted dynamically, i.e. with constant changes of position. After a few shots (bursts) the position in the trench changes. Soldiers try not to stay long in outlying cells, as this position is too predictable for the enemy to concentrate his fire.

2. When an enemy attacker flanks the trench, the trench is shot over a long distance because the attackers are firing from the top down. The broken line of the trench does not completely eliminate this problem, also due to the use of "Somalian-style" firing by the attackers with their arms extended upwards. Attackers to the right and left of the trench entrance at some distance from the trench zigzag (to the right of the entrance shoot trench sections deflected to the left; those to the left of the entrance shoot trench sections deflected to the right). A flanking shot results in many of the escaping troops being blocked in their firing cells and unable to leave.

3. Somalian-style firing (with arms outstretched or raised without aiming) is often used by both attackers and defenders, particularly when firing from trench to trench.

4. A frontal, even assault of the trench by the attackers was not successful, except for a 5:1 fire superiority of the attackers over the defenders. In other cases, the attackers' scheme of action consisted

of leading a sub-group

The attackers (2-3 men) enter the attacked trench (usually from the flank) and clear the trench from the inside with fire support from the outside.

5. It is tactically advantageous to use crossfire from neighboring rifle positions behind the barrier to stop a frontal offensive. A reduction in defensive casualties has been noted. However, the disadvantages of the static position as in the standard trench pattern using frontally facing loopholes for firing remain (in particular, the enemy sooner or later determines where the fire is coming from and can throw a grenade into that place). The oblique fire pattern is tactically superior to frontal loopholes, but less advantageous than dynamic defense.

6. In terms of small arms close combat, a bunkerless trench is less advantageous than a bunker with loopholes for firing. Although the attackers are hit in much the same way as in a bunker pattern, the defenders are knocked out more quickly in a bunkerless pattern.

7. The use of firing steps (crate stands) for firing over the barrier without loopholes is disadvantageous. The gunner is exposed to fire from all sides as he rises above the barrier.

8. In defense, it is tactically advantageous to divide the defenders into two subgroups: a) a "locking" subgroup, which prevents the attackers from advancing along the trench. This subgroup fights in direct contact with the enemy.

A "remote engagement" team, which fires at a distance of three or four trench cores from the point of contact with the enemy, primarily by going behind the trench berm and aiming to fire from above downwards.

Recommendations (tentative)

When arranging defensive positions, it is necessary to take into account not only the possibility of fighting at a distance comparable to the effective range of fire of the defender's weapons, but also at a distance comparable to the effective range of the defender's weapons.

ultra-short ranges (0 to 40 meters), including when the enemy enters the flank of the position. For this purpose:

1. To conduct dynamic defense, at least 3 main rifle cells with firing slits for each defender must be provided in the trench berm for a squad and above. This is not to be confused with the provision of alternate and false firing cells. These are the main positions. This is especially important in trenches created by excavators and earthmoving machines. The bunkers of such positions are extremely high and the number of points of fire against the enemy is very limited.

2. In the steepness of the trench (both front and rear), recesses (cells, shooting steps) should be created which can be used for short bursts inside the trench when the enemy attempts to block the defenders with fire along the trench. Such recesses may be staggered, alternating between the front and rear of the trench. The additional cells referred to in paragraph 1 and the recesses referred to in this paragraph may be combined. From above, the trench will appear as having a large number of adjoining cells. Reducing the length of trench runs between bends may also be desirable in order to maintain the ability to move within the trench in jerks.

3. At least three exits should be provided per squad in the trench, notionally perpendicular to the main line of the trench, to maintain the possibility of free exit from the trench to surface level and to fire on the attackers. It should be taken into account that there may be a combination of suppressive enemy fire from the front and other directions. The rear berm must be of sufficient height to allow such exit and fire. The height of the berm does not have to be the same for the entire trench. They may be higher in some places and lower in others.

4. In a squad trench at least two pairs of loopholes in the baffle should be made for oblique fire when the shooter is completely covered by the baffle from the front. The direction of fire in each pair is crossed. Cells with such loopholes must be adjacent to each other. A loophole for oblique fire is the same as the one in the front.

It should be possible to fire roughly parallel to the trench in close proximity to it.

It is also necessary to conduct "Somalian-style" firing drills to improve the effectiveness of such firing, in particular to prevent the gun from being cocked upwards. The soldier should be able to feel at which hand position the bullets are flying roughly in the direction of the target.

It's important

Strikeball equipment was used to simulate shooting combat in the experiment, so the conclusions and recommendations made:

(a) Do not take into account the peculiarities of small arms combat at ranges exceeding 20 meters;

b) do not take into account the peculiarities of firing at trenches with heavy weapons (for example, the roofless scheme of trenches was justified, first of all, by their lower visibility for artillery and aviation targeting than trenches with barriers, which justified the deterioration of the protective properties of such a trench for small arms combat);

c) do not take into account the lower level of fear in the experimental participants.

The conclusions and recommendations are to be verified by interviewing combatants who took part in close combat during the assault or defense of trenches.

Other thoughts, observations, remarks on tactical experimentation

1. When attacking a trench in the flank, the formation is not maintained in a chain by the attackers. As the formation approaches the entrance to the trench, it begins to take the form of a funnel, with the narrow part the entrance to the trench. As a result, by the time they enter the trench, the flanking soldiers are unable to maintain fire on the subgroup penetrating the trench. It is likely that

the soldiers moving on the flanks of the chain do not understand the need to move forward to approach the trench.

The chain formation, in particular, is necessary so that the soldiers on the flank of the chain can fire into the zigzags of the trench. In particular, it is necessary for the soldiers on the flank of the chain to be able to shoot the zigzags of the trench.

2. Rolling movement (one shoots and the other moves) is not actually used. Even in cases where the use of rolling movements was mentioned prior to the start of a training attack, once the chain movement was initiated, it was almost immediately converted to the movement of disparate units. It is not clear whether this is due to insufficient training or to the ineffectiveness of rolling movements.

3. When trying out the oblique fire pattern from neighboring cells, some soldiers noted that they were not very comfortable knowing that their cells were not personally firing in self-defense. You don't defend your cell, only your partner does. Other soldiers commented that there were no problems with this fact. Perhaps in order to alleviate this problem, it would be useful to have only part of the soldiers participate in close-in fire and the other part participate in dynamic defense.

4. If one of a pair of soldiers leading oblique fire from neighboring cells was eliminated, the mutual support scheme collapsed and it was necessary to switch to frontal fire.

5. Soldiers have noted that the outrigger cells are used more as a distraction for the attackers. They draw their fire, which in reality is directed at an empty space. There are usually no defenders in them.

6. Even when the possibility of flank maneuvers was artificially limited and it was not possible to stop all attackers in front of the front edge of the defense, one of the attackers would still enter the trench and the fight in the trench would begin. The losses of the attackers could be very high, but some of them would get into the trench.

7. For firing over the bunker from the trench, in the absence of shooting steps, a foot rest was used in different steepnesses of the trench - frontal and rear.

8. The low grass (20-30 centimeters) in front of the trench loopholes made it very difficult to see both attackers and defenders.

9. The defenders recommended allocating sentries to monitor the possible convergence of the attackers from the flanks.

10. The soldiers who participated in the experiment had a positive attitude toward the training with strikeball equipment and said that the understanding of fire density became clear to them only during this training.

Description of the tactical experiment

The original task as it was understood before the experiment.

The ongoing work to generalize combat experience has revealed a tactical problem for which there is currently no established solution. This is the conduct of defensive combat from a trench at ultra-short ranges (in close proximity to the defended trenches) when the attacking enemy enters a zone 0-40 meters from the defended trench.

Such a fight is relatively common in the context of SWO. It occurs:

(a) When landing paratroopers from a TBM 3-10 meters from the trench under attack;

b) when using a creeping attack under cover of small caliber mortars and AGS (support fire is transferred when the attackers approach to a distance of about 20 meters from the attacked trenches);

c) when using a creeping attack to distract the enemy from another direction (the creeping group reveals itself by throwing grenades 5-10 meters from the attacked trench);

d) when the enemy is detected in dense forest belts and comes in close proximity to the defended trench (visibility may not exceed 30 meters);

e) when the enemy comes within about 20 meters of the attacked trench, change from firing 60-mm mortars and AGS (at about 50 meters to the trench) to throwing hand grenades (which is carried out up to about 20 meters to the attacked trench);

(e) when a flank attack is used to confine the enemy from the

front at ultra-short ranges in forest plantations

(e.g., a dash bypassing the enemy group across the field along the edge of a wooded area at a distance of about 50 meters to reach the edge of a defended trench under cover of frontal fire from a fire support group);

(e) When an enemy attacker in the course of normal firearms combat comes to super close range.

The presently used trench equipment scheme involves the creation of a relatively high bunker (the defending soldier's head is below the level of the bunker) with firing slots organized in a system designed stop the enemy within 400-100 meters of the defended trench. In close combat, slits in the loopholes prevent fire maneuver and the bunker hinders observation. The soldiers in the trench are in a less advantageous position than the attackers. The position of defenders in the trench is more predictable than attackers outside the trench, and maneuver is limited. Consequently, they are easier to suppress with small arms fire and grenades. The situation is complicated by the use of canopies or other types of improvised barriers, which are becoming increasingly common as a countermeasure to UAV grenade and VOG drops.

Given the lack of a ready-made solution to the problem, it was proposed to conduct tactical experiments on defensive combat at ultra-short distances using strikeball equipment on the basis of... a polygon located in the NWO zone.

In particular, the following possible modifications of the field fortification system can be explored: a) roofless trenches or roofless sections of trenches, either unilateral or bilateral; b) cells for oblique (flank) fire, including longitudinal fire along the bunker; c) equipping the trench with shooting steps for firing over the top of the bunker from any point other than the loopholes; d) using the enlarged rear bunker as the second tier of a defensive position. In the course of tactical experiments, some other solutions may be found, which are not currently being considered.

Conducting the experiment

The experiment involved two groups of 12 people each from among the soldiers being trained at the test site. The soldiers were of different ages. Their physical condition was good. A small number of them had already taken part in combat operations, including trench cleaning.

Each group was divided into 4 soldiers on defense and 8 soldiers on offense (1:2 ratio). In an initial attempt to divide the experimental group into 3 soldiers on defense and 9 soldiers on the offensive (1:3 ratio), the defenders were knocked out of the attackers' original positions by fire, which resulted in the attackers not moving much, but rather seeking to engage. In order to force the attackers to maneuver and close in on the defensive positions, and to motivate the defenders to actively resist, a deviation was made from the "classical" ratio of defense to offense. At a 1:2 ratio, each side had a chance to "win" the training battle. Note that with a ratio of 2 soldiers on defense to 10 soldiers on the offensive (1:5), the attackers, marching frontally at full height, knocked out the defenders, losing only one man.

Two different sections of a standardized training trench with firing cells were used. One was more crumbled than the other (the former is more often used for training purposes). The first trench, due to the crumbling of the walls and the corresponding reduction in depth, had two "roofless" sections about 5-7 meters long. On the sides of the "roofless" sections were high enough areas of bunker, which made it possible to work out a scheme based on oblique fire by a pair of soldiers completely covered by the bunker from frontal fire. The fire was cross-fire (conventionally X-shaped pattern). This differs from the conventionally "American" scheme of defense organization (see, for example, **Infantryman's Handbook**, Appendix 7, pp. 349, 355. 349, 355. <http://kuos-vympel.ru/book-markin-infantryman-handbook-2022/>), where fire is conducted by a pair of soldiers standing almost . Randomly selected

the oblique fire scheme seems more successful than the "American. The soldiers are facing each other almost face to face and can coordinate more easily. Soldiers face each other almost face to face and it is easier for them to coordinate their actions. In order to practice the scheme with the use of firing stages, ammunition boxes were used to fire over the top of the bunker.

On the first day the training battles were fought for about 3 hours, on the second day for about 2 hours. Different introductions were given: assault from the front only; assault from the front, but with the possibility of flank maneuvers; assault from one flank, assault from the other flank. In all cases, the starting position of the attackers was about 20 meters from the positions of the defenders.

NRICOME 3.

Challenges of Nechoya's Vacuuuccal Learning¹ taking into account the CBO's onyoua

I. Introduction to the problem

As the experience of the NWO has shown, teaching what is necessary in combat has proven to be a very difficult task. Most, if not all, of the accumulated array of infantry training methods, both domestic and foreign, turned out to be inconsistent with the actual tactical forms of combat.

To begin with, perhaps the most glaring example. The basis for infantry training has traditionally been to teach "rolling" movements according to the "one covers, the other runs" scheme: one soldier fires to suppress the enemy, while the other makes a relatively short run, at the end of which he goes to the lower level and opens fire himself. Then the roles of the soldiers are reversed: the one who was running is covering fire, the one who was covering is moving. Thus in the process of approaching the enemy position there is a constant change of roles, and the enemy is all the time trapped under the bristly top of the trench, unable to raise his head and shoot effectively at the attacker. "Rolls" can be used to bring together both soldiers within a single smallest tactical unit of twos or threes, as well as the components of an attacking unit deployed in a line, be it a squad, platoon, or company. This would seem to be logical and basic.

¹ The author deliberately does not use the term "motorized riflemen" because he believes that it does not correspond to the tactical peculiarities of combat in NWO conditions. Combined combat between BMPs/APCs and armored vehicles is uncharacteristic. If BMPs/ APCs are used, are mainly used only as a kind of cab to deliver infantry to a planned point. BMPs/ APCs provide fire support to the

infantry only occasionally. It is an atypical way of acting as a fire support group, namely suppressing the enemy with fire to allow a dismounted troop, acting as a maneuvering group, to close in on the enemy.

but a century and a half of combat experience², but in practice do so. Convergence is usually done at full height, barely ducked, and if running from cover to cover is used, it is at the decision of individual soldiers, which has nothing to do with interaction in twos/triples. The body armor and the total weight of the equipment make running over clumsy and not fast. Displacements after a fall are not used. Fire is also opened by the decision of individual soldiers, mostly when they decide that they need to sweep a point with fire. There is no question of maintaining continuous fire on the enemy. Rolling movements are of limited use as a tactical technique. At the same time, training in rolling movements is methodologically very convenient, it explains clearly and clearly the combination of fire and movement, which is one of the basic principles of combat. A difficult question arises: **should or even can a little-used tactical technique be taught on the basis of methodological convenience alone?**

There is another component to the problem of changing approaches to infantry training - if only those things that are directly applicable in combat are left in the training program, it may seem as if there is little left of group tactical training. A good example of topics that are "left out" of the training is the many infantry maneuvering techniques (formations, deployments, maneuvers, many forms of ambushes) that are not applicable when fighting in a forested area where the line of action is only 20-30 meters wide. In the course of combat operations, due to the development of the use of electronic means, the use of sending troops on foot into the enemy's rear has completely ceased; it has become impracticable and, most importantly, generally unnecessary. A huge layer of tactical techniques related to the actions of reconnaissance groups became unclaimed. The "directly applicable" in the context of the NWO is a rather limited set of tactical knowledge and skills,

² The "rolls" movement was used by the Russian army as early as the Russian-Turkish War of 1877-1878.

which is insufficient for the formation of tactical thinking of a soldier.

A paradox has emerged in infantry training. In order to train soldiers tactically, it is necessary to teach them techniques that have no practical application in combat or are only applicable in a narrow range of combat situations.

II. Gap between pre-war perceptions and SWO experience

Let us consider the most important discrepancies between pre-war tactical concepts and the combat practice of infantry operations in the NWO.

2.1. "Failure" of the Combat Statute.

Many people do not realize the extent of the discrepancy between what is written in the current Combat Regulations on the Preparation and Conduct of Combined Arms Combat (hereinafter referred to as the Combat Regulations) and the way combat operations are actually conducted.

The gap was much larger than in 1941-1942. At the beginning of the Great Patriotic War, the echeloned formation of sub-units in attacks on shallow German defensive positions led to the fact that only a small proportion of firepower was involved in the battle. This forced the formation of attacking units in a single echelon. A number of less significant clarifications were also made to the governing documents, such as the commander's place in the rifle chain. But on the whole, the attack format did not change dramatically. Later, as the Germans changed their defensive tactics, there was a certain backsliding in the issue of echeloning to pre-war ideas.

This was not the case with the NWO. The scheme of "end-to-end attack" by mechanized units, on the use of which the current Combat Regulations are based, turned out to be unrealizable in all respects. No amount of clarification or modification would change the

picture.

Let us remind readers in general terms of what this scheme is all about. The main problem that the "end-to-end attack" must solve is the sealing of breaches by the defending troops by bringing reserves to the breach. The position crisis of World War I was largely due to the fact that the reserves of the defending forces were arriving at the breakthrough faster than the advancing force had time to develop success. The second part of the problem was the difficulty of keeping any large mass of troops within the effective fire zone of the defender's unsuppressed artillery for long periods of time. The longer the attacker was under fire from the defending artillery, the more casualties he would suffer, which could lead to the failure of the attack. The answer to these challenges is speed of breakthrough. The rejection of complex infantry tactics (maneuvering takes time) in favor of offensive speed was perhaps the main characteristic of the Russian tactical school.

A "cross-cutting attack" involves the following sequence of actions. We warn you that the description will have to be simplified. First the artillery opens fire on the enemy positions, making it impossible for his firepower to fire on the attacking troops. Then, at high speed, tanks and infantry in BMPs/APCs, built in several lines (in fact, in an armored "phalanx"), come to a safe distance from the bursts of their artillery shells. The tanks approach at a distance of 200 meters from the enemy trenches, the BMPs/ APCs following them at a distance of 300 meters from the enemy trenches. At this point the artillery fire is moved deep into the enemy defenses (more rarely, it is stopped). Then the BMP/ APCs catch up with the tank, the tank reduces its speed to that of a running infantryman, the infantry rush out of the BMP/ APC and line up behind the tank. The BMPs/ APCs move to the flank to fire on the enemy position. Then, following the tracks of the tank tracks, the infantry crosses the minefield and on the side of the minefield closest to the enemy deploys into a firing line. At the moment of deployment it must be about 100-150 meters from the enemy trenches. The tank and the BMP/APC are at all times firing to suppress the attacked unit.

position. The infantry chain then moves at a rapid pace towards the enemy position. When approaching it at 25-40 meters, a volley of grenades is thrown, the bursting of which causes the enemy soldiers in the trenches to take cover. This allows the infantrymen in a chain to dash across the remaining distance to the enemy and shoot the enemy soldiers with downward fire. Running or walking at full height in a chain of infantry should last for a very limited time, a little more than a minute. During this time the enemy simply must not have time to come to his senses and open effective fire.

In the post-Soviet years, a minor change was made to the attack scheme of the Combat Regulations, namely, the squad was divided into a maneuvering and a firing group and allowed to overcome the minefield sequentially along the passage: first the maneuvering group, then the firing group, whose soldiers are armed with heavier weapons. On the whole, the change was unprincipled.

The experience of the initial period of the NWO showed that such a scheme could not be realized in practice. It is not possible to achieve suppression of enemy firepower through artillery and tank fire. The enemy retains the possibility of effective fire at the moving armored phalanx. Taking into account temporary means of surveillance (including UAVs), communications (including via the Internet), automated artillery fire control systems, and precision-guided weapons (ATGMs), armored vehicles attacking in deployed formations through open spaces were simply knocked out by the fire of the defenders without inflicting any significant damage. **The main "brick" that fell out of the "through attack" scheme was effective suppression of the enemy's firepower, which alone makes it possible to mass armored vehicles in open spaces.** The problem arose at the beginning of the SWO, when the use of kamikaze UAVs was sporadic. If we try to reproduce the "end-to-end attack" scheme now, then strikes with this type of UAV will create additional difficulties.

The author has heard different, sometimes mutually contradictory, explanations of the reasons for the impossibility of suppressing firearms.

The low level of organizational culture in the Russian Armed Forces, which does not allow to achieve the necessary speed of information passage from target reconnaissance to defeat; b) the Russian artillery losing to the Russian artillery in the initial period of combat operations: a) the low level of organizational culture in the Russian Armed Forces, which did not allow achieving the necessary speed of information passage from reconnaissance of targets to their defeat; b) the Russian artillery's loss in the effectiveness of defeating enemy artillery, with accuracy and range proving more important than massing; c) the objective impossibility to free the "lower sky" from the enemy's reconnaissance UAVs and, as a consequence, the transparency of the battlefield, which does not allow, in principle, to achieve blinding of the enemy's firepower; d) the effectiveness and mass availability of light high-precision anti-tank weapons. More exotic versions have also been put forward. The author has no information that would allow him to objectively assess these explanations and give his own view of the reasons for what happened. Actually, this is not so important for the purposes of this article. The main thing is that one of the fundamental conditions for the realizability of the statutory scheme of attack turned out to be impossible to implement.

separate issue is the possibility of returning to the conditions that allowed for "end-to-end attacks" and thus restoring maneuverability in the course of an ISR, moving away from the positional nature of the confrontation. Since 2022, the use of strike UAVs (both drop and kamikaze) has increased dramatically. An analogy can be made with World War I. Machine guns were not the reason for the transition to positional confrontation, but rapid-fire artillery, but during positional warfare itself they played a crucial role in making infantry attacks impossible by conventional means. Similarly, during the NWO, it was not attack UAVs that caused the transition to position warfare, but they play a crucial role in making it impossible to resume maneuver warfare until the problem of clearing the "lower sky" is solved. Clearing the "lower skies," at least in the direction of main force concentration (the breakout

direction), has become a prerequisite for resuming maneuver warfare. How and when the warring parties will be able to accomplish this task is an open question.

In order to understand how far the actually used attack schemes are from the prescriptions of the Combat Regulations, it is necessary to briefly review them. In essence, the **whole variety of attacks boils down to two forms**: a) an attack by a super-small group against a small enemy defensive position with a hidden approach (hereafter referred to as a "hidden approach attack"); b) a sudden "cavalry dash" to the enemy position by a single BMP or a pair of them (hereafter referred to as a "cavalry dash attack").

The general pattern of the armed struggle is based on the fact that concentration of large numbers of defenders in positions is impossible. Positions would be swept to the ground by artillery. Therefore, the defenders disperse their positions and occupy them with relatively small forces. This creates an opportunity for the attackers **to "shower" the enemy with a mass of small attacks**, most of which are unsuccessful. The author has been quoted as estimating that there are up to eight unsuccessful attacks per successful attack. After a failure, the attacks are repeated. Sooner or later, however, the enemy misses a blow, loses a position, which leads to a reconfiguration of the line of contact, threatens approaches to other fighting positions, and forces the enemy to retreat. A mass of unsuccessful attacks, if properly prepared and supported, is also useful in a sense. It reveals the location of enemy fire and observation assets, which are destroyed, and depletes some of the enemy's and ammunition. This creates conditions for the enemy to miss some next strike. Unfortunately, there are attempts to attack at random, solely in the hope that the enemy will not have time to react with his firepower to the attack. This is supposed to allow the attackers to rush to the attacked objective. Of course, the approach of "showering" the enemy with a mass of small attacks does not mean that it is not necessary to organize before and during the attacks to identify and pressurize the defender's firepower and electronics, and especially the positions of the operators of strike and reconnaissance UAVs. In any , an offensive approach based on

on multiple small attacks, is now virtually the only one.

A **stealth attack** consists of a group of 4 to 15 men (with a tendency to reduce the number of soldiers) approaching the enemy position as stealthily as possible through wooded strips or buildings. If the enemy does not detect it or has no means of defeating it on approach, the group moves at close range to the defender's position. There are very few soldiers in position in a super-sparse battlefield. What follows is a fire fight on the principle of "unorganized crowd on unorganized crowd". The result of the decides who retreats and who takes the position.

A **cavalry dash attack** involves selecting a point in the enemy area where an infantry troop can be dropped. If necessary, the area of the enemy defense where the infantry landing will subsequently take place is shelled with artillery fire. In some cases, an unoccupied place between enemy positions is simply chosen as the landing site. Then 1-2 BMPs with the troop (accompanied by one tank or not) drive at high speed to the planned landing point, where the troop is rushed. Often the rush is carried out literally 10-20 meters from the enemy trench. The paratroopers then engage in a firefight, which is also conducted according to the following principle "unorganized mob on unorganized mob."

In both cases, the calculation is based not only on suppressing the enemy with fire, which will ensure the possibility of approaching him, but also on the enemy missing a strike because of the impossibility of perfectly organizing observation of a vast, dispersed battlefield.

It should be noted that the experience of the NWO has once again demonstrated the possibility of "systematic surprise" in combat operations. It would seem that the repetition of the same schemes would sooner or later, or sooner rather, lead to the organization of such a surveillance system that would make it impossible to launch attacks based on late detection of the attackers by the defending enemy. However, combat experience shows that it is impossible to organize

A perfect surveillance system that warns of every attack, especially when the surveillance system is exposed to the attackers' fire and electronics, is not possible. Some attacks are missed anyway. Here one can recall the American experience of the Korean War, when night infantry attacks by Chinese troops were expected and the order of their realization was predictable, but the defending U.S. troops still missed some of the strikes, no matter how much they tried to improve the advance warning system. It should also be noted that suppressive fire, understood as almost continuous fire on enemy positions, preventing them from coming out of hiding to return effective fire, is now being supplemented and in some respects even replaced by strike surveillance. It implies readiness for immediate opening of fire by on-duty fire units upon signal of detection of enemy firepower or positions, which comes mainly from electronic equipment, including UAVs. Suppressive fire and strike surveillance can be used in parallel. The first is for pre-detected positions, the second for targets detected during an attack.

One should not underestimate the implications of the changes in combat tactics for military training. Given the **high degree of "statute-centricity" of the Russian combat training school, the loss of moral authority behind the Combat Manual, which has not at all kept up with the forms of combat operations, is a rather significant factor for the entire combat training system.** Soldiers simply stop believing that official training methods contain valuable and practically useful information.

It should be emphasized that it was not only the domestic Combat Regulations that proved inapplicable in the current conditions. In fact, the **standard NATO schemes also turned out to be unsuitable for the conditions of the NWO.** Very simplistically, they can be reduced to two basic varieties: a) the combined forces breakthrough (combined arms breach) and b) the flank attack with suppression at right angles (hasty attack battle drill/battle drill #1).

A combined force breakthrough implies that the means of senior commanders (aviation, artillery) destroy all supporting firepower outside the defender's attacked position. Next, the suppression team, in which the tanks are arranged in a wedge or, more precisely, in a "pig" formation, with engineering vehicles (an armored launcher with an extended mine-clearing shell, tanks with a minesweeper, an armored bulldozer, and a bridge-laying machine) following close behind, drives up to the front edge of the minefield. A group of BMPs with assault infantry inside, also lined up in a wedge, moves some distance behind the suppression team. Having stopped in front of the minefield, the tanks fire to suppress the enemy positions. In the breakout area the density of tanks and BMPs is very high and can be as high as 1 vehicle per 25 meters of frontage. Under the cover of such concentrated suppressive fire, the engineer vehicles make paired passages in minefields and set up crossings over the anti-tank ditch. Then tanks rush deep into the defense along the passages, and infantry on BMPs land in close proximity to the enemy trenches, jump into them and clean the trenches from the inside. Ideally, such a breakthrough is accomplished in less than 20 minutes. This tactical scheme is based on the full pressure of the attacked position and its supporting firepower while the defender's engineering barriers are being breached. This is unattainable in the context of the NWO. No concentration of forces in the area where the main effort is concentrated will destroy all UAV teams, including kamikaze UAVs, and even a single surviving artillery piece in a transparent battlefield and high-precision targeting systems will unify the few engineer vehicles making passes in minefields. A crowd of tanks and BMPs standing behind the minefield creates a lot of good targets for the defenders. An attempt to implement the NATO breakthrough scheme will lead to the same results as attempts to use the statutory scheme of attack by the Russian Federation Armed Forces.

The flank attack with a right angle suppression is the basic underlying tactical technique that underpins the

The idea is that a part of the sub-unit (firing sub-unit) fires at the enemy, driving him under the trench berm. The essence of the scheme is that a part of the sub-unit (firing sub-unit) fires at the enemy, driving him under the breach of the trench, preventing the defenders from raising their heads and firing effectively at the attackers, while the other part (maneuver sub-unit) goes under cover of the firing sub-unit to the flank of the enemy position and storms it, gradually moving along the position. The suppressive fire of the sub-unit gradually shifts along the direction of movement of the maneuver sub-unit, each time taking suppressive fire off a small section of the attacked position. This allows the maneuver sub-team to seize the position piecemeal, having fire superiority over the portion of the enemy unit that is unsuppressed as a result of the displacement of suppressive fire from the firing sub-team. Given the standard size of fields framed by wooded areas in the steppe zone of Ukraine, suppression by infantry means is simply not possible. The field size averages 800 meters by 1,200 meters. A fire sub-team armed with squad or platoon standard weapons simply cannot be placed so close to the attacked position that any effective fire can be delivered to suppress the enemy position. It is extremely dangerous to try to permanently position a firing sub-team outside a forest belt. In a clear battlefield, the position will be quickly overwhelmed. It is not possible to use BMPs/APCs from a stationary position as a firing sub-group because of their visibility. It is possible to use 12.7-mm machine guns and AGS as a firing sub-unit, but this requires going beyond the standard organization and staff structure of lower infantry units. In any case, when the maneuver is restricted by forest belts, a maneuvering subgroup cannot flank. It will encounter the enemy in a neighboring forest belt.

In essence, there is nothing more "NATO standards" can offer tactically. This, by the way, does not negate some positive aspects of the algorithmic approach to training used in NATO countries, where tactical techniques are presented through algorithms/protocols. However, on the whole, the NATO "statutory"

approach proved to be as ineffective for the conditions of SWO as the domestic one.

To conclude this subsection, it should be suggested that the **problem may be not only and not so much with the current version of the 2017 Combat Regulations for the Preparation and Conduct of Combined Armed Combat, but rather with the concept of the combat regulations as such.** It is modeled for the most probable combat scenarios of the most probable war. The difficulty is that the development of scientific and technological progress is so unpredictable and the correlation of technological resources with the enemy is so dynamic that it is simply impossible to guess future war scenarios. If one tries to transfer the experience of the NWO into the Combat Regulations, it is very likely to be unsuitable or even harmful in the next war.

From regulations on probable combat scenarios, it is necessary to move on to tactical charts describing the various tactical options and the conditions of their application. The albums should provide the soldier and officer with sufficient background knowledge to be able to adapt tactics to specific battlefield conditions. However, this topic deserves a separate discussion. Let us further consider other discrepancies between pre-war tactical concepts and combat practice of the NWO.

2.2. Instead of fire suppression, it's aftershock.

An equally fundamental inconsistency is the limited use of suppressive fire to realize infantry attacks. It is suppression understood as continuous fire on the enemy, preventing him from firing effectively at those on the move during an engagement. Suppression that forces the enemy to hide in cover, preventing him from sticking his head out to take aim from the trench. This suppression allows the infantry to close to the shortest possible distance to engage in close combat at grenade range. The change from the concept of destroying the enemy to suppressing his position was an important milestone that allowed World War I to overcome the positional crisis and return to relatively maneuverable

The military men of both opposing sides noticed that regardless of the intensity and duration of the artillery preparation, after the artillery preparation was over, the defenders almost always had enough firepower left to slow down and, after the introduction of reserves, to stop the advance of the attacking infantry. The solution to this problem was the fire-shaft tactic, where the attacking infantry enemy positions during, rather than after, the artillery barrage. Once the infantry had reached a safe distance from the bursts of their shells (100-150 meters in those days), the artillery fire was moved a hundred or two meters deep into the enemy's defense. While the defenders realized that their positions were no longer under fire, while they were running out of their dugouts to take up shooting positions, the attacking infantry managed to cover the specified distance in a jerk and get above the enemy trenches before the defenders could effectively counter them. The difficulty in using this tactic was the need to synchronize the transfer (cessation) of suppressive fire and the infantry's forward movement. Not immediately, but these issues were resolved by all opposing sides.

This is not to say that this scheme is not utilized at all during SWOT. The use of automatic grenade launchers and small-caliber mortars to achieve the same effect is particularly effective. The safe distance ranges for their ammunition are relatively short, making it possible to cover the distance to enemy trenches in a single burst. With large caliber guns the situation is slightly more complicated. Thus, the statutory safe distance limit of 400 meters does not allow them to cover the distance to the enemy trench with a single jerk. It is necessary to use small caliber guns at the final stage of artillery preparation. In some cases, the suppressive effect of small-caliber guns and large-caliber machine guns of BMPs/BTRs can be used.

However, in a significant part of cases suppression with displacement (cease-fire) in front of the attacking infantry is not used. Another thing is used - the aftereffect of a knock

In the case **of** small-unit attacks, **not only artillery fire** is used, but also **RPG fire**, including the use of 82mm mines instead of **conventional shelling**. In small-group attacks, not only artillery fire is used, but also RPG fire, including the use of 82-mm mines instead of standard rounds. At the moment of shelling, fear paralyzes the body, prevents it from doing anything, and suppresses the will to resist. This effect lasts for some time after the cease-fire. That's what they use. That is, the general scheme is that the enemy positions are shelled, then the fire is stopped, and only then do they begin to approach each other. If the enemy resists, they roll back to repeat the advance at a later date. At first glance, this approach seems to be less reliable and risky. The shock effect is highly dependent on the individual qualities of the enemy soldiers. Some, especially experienced soldiers, may not go into shock all. Some may quickly withdraw from it. Permanent suppression looks like a preferable option against this background. However, it is not used.

This question certainly deserves more detailed study, given the proportion of infantry tactics that rely on suppressive fire. However, it can be assumed that the shift in the role of suppression from large-unit tactics to small-unit tactics is misguided. Combat in the course of the NWO took on the character of clashes between small and super-small groups. Organizing suppression is not easy, as noted above. But another factor may be more significant: it is practically impossible to synchronize the transfer (cessation) of fire and the infantrymen's dash at the level of small group tactics. The level of education and training of most infantry, with the exception of conditionally elite units, does not allow this. And we are dealing with a rather typical "error in dimensionality" when a tactical technique for one level of organization is transferred to another level, even though it is ineffective at that other level.

The author does not dare to make a final judgment whether the non-use, or rather the limited use, of fire suppression is a consequence of insufficient training of soldiers or whether the ideas about its realizability at the level of small group tactics are not confirmed by combat practice.

2.3. No group sweep of the premises (and to some , the trenches).

Another tactical surprise was the lack of use of group clearing techniques. The mere enumeration of group sweeps demonstrates how much emphasis is placed on the group approach in training methods. We have: a) dynamic assault by a foursome (all four enter the room), b) dynamic assault by a fivesome (four enter the room, the fifth remains to cover the corridor), c) dynamic assault by a threesome (two enter the volume, one controls the center of the volume without entering it); d) sequential sweeping of the volume from the outside by "slicing the pie" with a pair of soldiers, followed by a "hook" or "cross" entry into blind corners; e) three-step entry, when on the third step a pair of soldiers standing back-to-back do not physically enter the volume, but only move inside, pointing their weapons in opposite directions. And this is only one element - entering the room. There are also different ways of moving along a corridor (with a sequential change of leading number at each dangerous sector, a "stream") or with fixed positions in a group. And **all this tactical splendor is not in demand.**

Given the shift to small group tactics in rural assaults, it is simply not possible to gather the right number of people for a group sweep. When operating in cities, too many apartments have to be cleared in too short a time. In reality, sweeps are carried out one at a time, sometimes, if you are very lucky, two soldiers at a time. And the real tactic is to pull back immediately when the enemy is detected, followed by reinforcements and fire to knock the enemy out of the room. In other words, they shoot, shoot, shoot, shoot, shoot, and throw grenades into the room where they have detected the enemy until the enemy psychologically breaks down and moves away or is hit by shrapnel or ricochets of bullets. Often the fire is from outside the building.

The similar phenomenon is slightly less pronounced in the clearing of trenches. Here, however, the trench is cleared, mostly by a group.

In reality, however, a trench is cleared one at a time. Each soldier in the clearing group is fighting his own war. It simply takes place at the same time and in the same place as the "war" of the other members of the group. This is especially characteristic if the trench clearance is accompanied by a UAV. In this case, the UAV operator controls almost exclusively the forward soldier of the cleanup team.

2.4. Indifference to forms of fortification.

It does not matter at all what style of field fortification is used. It may be a trench with attached cells or with outriggers, it may have bunkers for oblique fire or exclusively for frontal fire, it may have the amber-zures of a DOT or ZOT or open loopholes. Individual cells or a line of trenches may be equipped. There will be no attack from the front. And an attack by a group of 4-6 men will still follow the most convenient trajectory for the attackers. Such a group will find a way to slip into the defensive line. Soldiers express a rare indifference to shape of the trenches. The only things that matter are the dugouts and the overlapping of the trenches from above. Anything open will still be read by attack UAVs.

2.5. Tactics without tactics.

It has already been shown in the examples above that the scope of unorganized small crowd combat against an equally unorganized small crowd, in which neither formation, deployment, nor interaction with other weapons and even within a unit is important, is gradually expanding. Small crowd vs. small crowd combat consists of firing chaotically at the enemy roughly in his direction. Sooner or later, one of the small crowds will start to fall back: either it runs out of ammunition, thinks the enemy has more, or the most important soldiers are knocked out.

The "cavalry dash" attack described above is a classic example from the point of view of its infantry component "no tactics without tactics." Just get on the vehicles and just go. Of course, such an attack should be conducted together with a complex of measures to suppress known and strike surveillance of newly appearing fire and electronic means of defense.

In the case of the enemy, however, it is the delivery of infantry to the landing point that may not involve any infantry tactics.

The proliferation of "tactics without tactics" reduces the level of motivation of soldiers to engage in tactical training. Why learn anything, spend mental and physical energy, and get tired if it all comes down to chaotic small group firefights?!

2.6. Interim Summary.

To summarize the above points, it can be stated that a tactical situation has developed at the front that is very different from what was envisaged in all military methodological literature, both domestic and foreign. This has a strong demotivating effect both on teachers, mentors, and on recruits arriving at the front, as well as on soldiers undergoing pre-training. What to do under these conditions is discussed below.

III. The king is dead - long live the king!

Even if we leave aside the possibility of a return to breakthrough tactics through neutralization of "lower sky" assets or the development of attack methods that can achieve results in the context of mass UAV use, and accept as a given that there will be no return to previous tactical forms, the current situation is not unique. Transition to new tactical forms has happened many times in military history. Military science should be used to it by now.

The combat practice of the NWO demonstrated two pronounced trends: 1) concentration of combat experience mainly in small group tactics; 2) unsuccessful results of attacks by any large mechanized units and their withdrawal by both sides of the conflict. In essence, there was a reversal from maneuver forms of combat operations to group infantry tactics, which had been developed between the two world wars (the 1920s and 1930s). The reason for the necessity of deep dismemberment of infantry combat orders and the transition to tactics

In the case of small groups, the over-concentration of artillery was considered. The experience of the end of World War I on the Western Front was extrapolated. As subsequent wars have shown, this extrapolation proved to be wrong, but infantry group tactics over two decades have generated a wealth of methodological materials for training troops, including in Russian. Perhaps some of them may be useful for today, although, of course, technology has advanced greatly.

If you look closely, much that is new in the practice of using troops is not new at all. There is a flow **of various elements of large-unit tactics into small-unit tactics**, which is only a continuation of a trend that began as far back as World War I. For comparison purposes, a comparative table showing the process of such spillover is given below. The table is, of course, preliminary, incomplete, and in some places controversial, but it gives a general idea of the processes taking place.

Comparison table

№	"BIG" TACTICS (RETURN AND UP)	SMALL GROUP TACTICS (4-7 PEOPLE)
1	Flank attack with frontal suppression of the enemy	Covering the 2nd echelon of the attacked trench parallel to the edge of the forest belt (1st echelon, "opening" the location of the trench). enemy position)
2	Pressing against the bursting shells of their artillery (firing rampart)	– Pressing against WOG AGS ruptures – Move to a distance of 20 meters from the attacked trenches under 82-mm mortar fire in coo- of a crawl-around

3	Sneak attack in the chain	Crawling on the navigator under an insulating poncho to the rear of a trench blocking a le-coplaning
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4	<ul style="list-style-type: none"> – Rolling movements in a chain – The British scheme of rolling waves of infantry across each other from the First World-war 	<ul style="list-style-type: none"> – Movement of doubles in column "caterpillar." – Rolling doubles in column over each other
5	Shooting artillery at tree branches to get a-- of air gaps	Shooting with under-barrel grenade launchers at tree trunks
6	The "accumulation" attack of the Russo-Japanese War.	<ul style="list-style-type: none"> – Pulling heavy infantry weapons into a forward chain in a wooded area, followed by a fire attack to an aftershock effect – Crawl back to the original position
7	False transfer of artillery fire (in terms of holding-of the enemy in the shelters)	False transfer of AGS fire with simulated bursts of HEAT by means of hand grenade throwing
8	Raid - withdrawal	Frontal attack in a forested area with a quick withdrawal if it is not possible to push through the enemy.
9	Attacking through a non-shooting corridor	A "cavalry dash" on the BMP together with concentrated artillery fire on houses or positions framing the path of the BMP and the landing site paratroopers

10	Tunnel Defense	Covering sections of trenches adjacent to firing cells to counteract the UAV dumps
11	Lining up in the tail of traffic- in a convoy of automob-	Tailgating the car drone

	of tires by reconnaissance units	
12	Mine anti-tank of the field behind their positions	The encirclement of infantry mines for trap trenches.
13	The "Chinese" way of supplying- The following table shows the number of people who have been on foot by porters	Hand carrying shells on position from the small warehouse closest to the front.
14	Deployment of reconnaissance teams	Zabasizing kamikaze drones and drones with drops behind enemy lines.
15	Transmitting information about the movement of your troops to yourself. bytes	Adjustment of individual combat in the trenches with the help of the UAV
16	Shuttle rapprochement forward and backward by tanks	Plastic infantry contact, where infantrymen do not take temporary cover when the attack is stopped, but start to move away to re-emerge. move forward
17	Detection of tanks at Kumeit in 1991 at nightfall from airplanes with thermal imaging cameras, taking advantage of the difference in cooling rate. of armor and soil	Detection of positions in buildings by drones with thermal imagers
18	Echeloned defense	Unequal defense in stored cellars and shelters after the offensive has been halted. beliefs

19	Longitudinal shelling of enemy positions by artillery in World War II	Longitudinal firing of single MLRSs for firing on the boundary
20	Officers have the cards	Everyone has maps on their smartphone
21	Triangulation of a special technique	Triangulation programs for smartphones

22	Shooting "lice-clearing" artillery at their DOTs, which were saddled with pro-opponent	Firing AGSs close to their positions at the call of suppressed infantry
23	Statutory "end-to-end attack", suppressing every last one of them of the moment with the tanks	Attack by armored vehicles along the forest belt, suppression to po po of the last moment with the tanks

As shown above, the tactics are not being simplified, nor are they being created entirely new, but just another type of modification. There is a feeling that every soldier, even non-commissioned officers, will have to be pumped with conventionally "officer" knowledge, compressing and simplifying the training material. At the same time, there is a methodological base, if one does not try to hold on to pre-SEE programs and methods with a dead grip.

The difficulties that arise in training are more of a psychological nature: 1) there is no certainty that the turn in tactics is irreversible and that there will be no return to the tactical forms on which pre-SWO training methods were based; 2) some of the material appears redundant, more complex than the tactics actually used; and 3) new tactical techniques and schemes may seem non-universal. The latter is especially important in light of the fact that much of the combat experience is gained from fighting in forest belts, and in the forest belts of southeastern Ukraine. These are very specific conditions. The experience of fighting in them may not be suitable for operations in other regions. It is characteristic that it is impossible to derive any useful recommendations for operations in the forest belts of south-eastern Ukraine from the actions in the Normandy battlefield in 1944, although purely outwardly the organization of land management looks similar. The arrangement of hedges in Normandy and the size of the fields surrounded by them are quite different. The tactical experience is also different³.

³ Capt. Michael Doubler. Busting the Bocage: American combined arms

operations in France, June 6-July 31, 1944; Fort Leavenworth, Kansas, 1989. Busting the Bocage: American combined arms operations in France, June 6 - July 31, 1944; Fort Leavenworth, Kansas, 1989].

The practical solution to this issue is really not difficult: 1) continue to familiarize trainees with tactics and schemes developed before the NWO, warning them that they are not in use now, but that there is a possibility that they will return them; 2) teach "new" tactics, even though they are potentially non-universal; and 3) give trainees "complex" tactical options - they will always be able to simplify them. What we should definitely not do is wait for military science to develop some average tactical methods for some average conditions of an average "modern" war and write it down in guiding documents. At best, this will take too much time; at worst, it will be impossible. It must be recognized that it is now impossible to guarantee that a tactical technique or scheme that is taught can be applied in practice. The task of training is different: to provide soldiers and officers with sufficient background knowledge of tactics to enable them to adapt various tactical techniques and schemes to the environment in which they will have to operate. Even if a technique is not directly practical for a particular soldier, it demonstrates the type of problems and the type of possible solutions that can be used in similar circumstances.

IV. What to do in practice?

Here we will consider a version of a training program for military personnel who are taking a short-term pre-training course prior to deployment to a combat zone. Unless otherwise follows from the text, the methodology of teaching tactical techniques based on micro-play and speech control formulas is described in the book: ***Kivil'ev A.H., Markin A.V. Accelerated Tactical Training. Methods of training.*** Moscow: Center for Strategic Conjuncture, 2022 (kuos-vympel.ru/book-kivilev-markin-tactical-training-fighter-2022/). References are further given to this edition. The following sequence is given in the material presented herein

It should be presented in such a way that it does not alienate students and teachers alike, as it is filled with questions that have no practical application, on the one hand, but provides sufficient background knowledge, on the other.

1. *"Cross-cutting attack"* (paragagraph 4.4, page 126). The description and explanation of the "statutory" attack pattern is left in the program as one of the visual ways of explaining the concepts of suppression in relation to artillery fire and the boundary of safe distance from the bursting shells of one's artillery, as well as the conditions under which full-length movement in a chain may be used. It is explained to the trainees that this does not apply in practice, but since it is written in the Combat Regulations, it must be understood.

2. *The block is entitled "Combat in a forest clearing"*. Here are three tactics relevant to the SWOT experience.

2.1. Frontal attack in the forest belt without external firepower support.

2.1.1. Initial formation of the attacking group in a column of one, divided into 3 subgroups:

1) detection and assault team of 3 people, the soldiers are lightly armed and not heavily loaded. Their task is to establish a route, and at the moment of the outbreak of hostilities to quickly escape to the lower level.

After 30 meters behind (or, more precisely, at a distance of stable visual communication) there follows

2) a group of heavy weapons, including a grenade launcher, his supporter, a machine gunner, and his assistant. Some of the soldiers have under-barrel grenade launchers. The commander and the radio operator are with the same group.

After 30 meters behind (or, more precisely, at a distance of stable visual communication) there follows

3) support team. The number of soldiers may vary, but the first four soldiers are two twos to fight enemy drones, armed with small arms adapted for shooting at drones (automatic rifles with collimator sights, SVDs, RPKs with telescopic sights, smoothbore

rifles for firing bound buckshot, etc.). There may also be soldiers

with portable electronic warfare equipment. This is followed by medics, ammunition and water carriers, and a casualty evacuation team. The support group performs the functions of a rear and side watch.

The distances between the soldiers are 7-10 meters.

2.1.2. At the moment of encounter with the enemy: a) the forward group is scattered in a conditional line by any method (e.g., "slog"), engages in small arms combat; b) parallel to it at a distance of 30 m, the heavy weapons group is scattered in a line in twos (grenade launcher, assistant grenade launcher; machine-gunner, assistant machine-gunner; commander and radio operator); c) in the support group, the UAV-fighting twosome move to the left and right edge of the forest belt, respectively, in readiness to fire at the UAV (the soldiers of this group do not sit side by side, there is an interval of 7-10 meters between them). The rest of the soldiers occupy the nearest shelters. The observation sectors are distributed alternately, i.e. the next soldier looks in the opposite direction from the previous soldier. The closing and penultimate numbers turn to the rear.

It should be assumed that the fight will start at a distance of about 30-40 meters, depending on the degree of transparency of the forest belt.

2.1.3. After completion of the initial formation, the heavy weapons group will run over without firing in twos to approximately the same line as the front group. At this point, the "rolls" movement is explained as an introductory exercise. At this time the UAV counter-UAV twos (left and right), moving sideways toward the enemy in a "snail" pattern, gradually move to the position where the heavy weapons group was originally. The rest of the support team may not move.

2.1.4. This is followed by a short, intense fire attack on the enemy by the advance team and the heavy weapons team. The grenade launcher fires the available rounds (remembering that the grenade plumage can hit branches), the machine gunner fires long bursts of more than half a box. This is done to achieve a shock

effect, paralyzing the enemy's will to resist. After the raid is over, two of the three soldiers of the advance team (the third covers in readiness to move out) are to fire into the box.

as a reinforcement), moving straight ahead in a straight line in a crouched stature, reach the enemy position with a quick dash. While moving towards the enemy position, heavy fire is directed at the approaching trench by the twosome. One of the twosome stays behind to control the trench from above, the other jumps into the trench after throwing several grenades. It should be noted that there may be more than one grenade. The statutory scheme of attack calls for the throwing of a single grenade, but there is a whole squad throwing grenades in a volley. This should be understood.

Further forward men call for reinforcements if the position, in addition to the transverse trench, has a communication path to the rear.

Variant. In addition to the attack termination scheme based on the use of aftershock, a variant using suppression should also be given. In this variant, during an intense fire attack, two soldiers of the advance team run out over the edge of the wooded area and, roughly parallel to this edge, jerk to the flank of the attacked trench. Of course, the soldiers in the heavy weapons group must know that fire is to be directed in such a way that bullets and grenades do not fly out of the tree line, and the grenade launcher must not fire if the forward two approach the attacked trench. After the raid has ceased, the advance team assaults the trench in the same manner as described above.

2.1.5. A very important element is withdrawal. It should be explained that if the fight lasts more than 5-7 minutes, artillery and UAV strikes are likely to start firing at the group's location. The location of the attacking group is very predictable. Therefore, it is necessary to withdraw. The withdrawal is done in reverse order (first in, first out): the advance group withdraws first, then the heavy weapons group, followed by the support group. Within the support group, the UAV cover twos are the first to withdraw.

2.2. Frontal attack in the forest belt supported by AGS or small caliber mortars.

In this case, the main means of suppressing the enemy (putting him in a state of shock) is an AGS or a light mine set in line with

the direction of the forest belt. Line

The safe distance from bursts is taken as 50 meters. Therefore, by the time the support gun ceases firing, the advance soldiers must be at this distance from the enemy trench. This makes the length of the assault jerk longer than in the previous example. To mislead the enemy about the transfer of fire, either firing underbarrel grenades into trees above the enemy's head or (less reliably) throwing hand grenades with a deliberate under-throw is used.

2.2.1. The initial formation is essentially the same as the previous example, except that the heavy weapons group is replaced by a group of grenadiers (soldiers with under-barrel grenade launchers, or in their absence with a supply of hand grenades). The machine gun and grenade launcher can be moved to the support group.

2.2.2. The reaction to encountering an enemy is the same as in the previous example.

2.2.3. Next, the commander in the second group begins to point the external support weapons. The forward group of riflemen is pulled back to the second group because it will be in the danger zone. The external support weapons are aimed by gradually approaching the enemy positions from deep, i.e. the first shots are fired with a guaranteed flight.

2.2.4. After the external support weapons have been given the necessary firing settings, the command is given for intense, short-term enemy fire. All survivors take cover. After the AGS or small mortar fire is completed, soldiers with under-barrel grenade launchers begin firing on the enemy positions. Two soldiers from the advance team, as in the previous example, start moving with the soldiers with underbarrel grenade launchers towards the enemy trench. The latter stop at a line of sight to the enemy position, from where they fire a volley into the trees next to the enemy trench. It should be remembered that the firing distance for underbarrel grenade launchers is 10-40 meters. The grenadiers should not come close to the attacked position, otherwise

The BOGs will simply not have time to fire. After this salvo, the advance twosome storms the trench in the same manner as in the previous example.

A somewhat less effective variant of the same scheme, when there are no under-barrel grenade launchers, is for grenadiers to throw hand grenades in the direction of the enemy with a deliberate miss. Of course, the sound of hand grenades and VOG AGS grenades, and even more so the sound of 82-mm mines. But it takes the defender, who has been driven under the berm of the trench, some time to make out in the cacophony of battle that his position is no longer under fire. This gives a few moments, which are used to close in on the attacked trench.

2.2.5. Subsequent actions, including rapid withdrawal, are performed in a manner similar to that described in the previous example.

2.3. Frontal attack with good collateral.

In this scenario, it is assumed that both large caliber artillery, small supporting mounted firepower, and attack UAVs are available for support.

2.3.1. Formation in column one at a time without sub-groups, except for the advanced paired sentries, walking 30 meters ahead of the main column.

2.3.2. When encountering the enemy, the forward paired sentries initially move to a lower level and then retreat to a safe distance from the bursts of their artillery (300 meters). The large caliber artillery fire is then replaced by small supporting mounted fire to return to within 50 meters of the enemy position. The cessation of large caliber artillery fire is the command for the UAV strike UAVs to be deployed on the ground by the main column.

2.3.3. After the small supporting firepower of mounted fire ceases, attack UAVs begin to strike enemy positions, allowing them to get within 20 meters of the enemy trench.

2.3.4. After the last UAV strike, the forward two storm the trench as in the previous examples.

2.3.5. Given that the group moves back and forth and its position is less predictable, withdrawal is used if the UAVs on the ground have run out of strike UAVs.

3. *Block "Trench cleaning"*. There are many methodological materials on trench cleaning schemes. We will not dwell on them here. It should be emphasized that at this stage the techniques of "pie-cutting" and "quick look" should be given, as well as a scheme of work with the roles of the shooter clearing the trench and the grenade thrower(s) separated. All variations should be given: when the grenade is thrown "overhanging" (parabola) by the second number under cover of the first number, the gunner; when simultaneously

"two grenades are thrown by the second and one of following numbers (into the nearest and second knee of the trench) also under cover of the first number - the gunner; and when a grenade is thrown or even rolled "city-style" in a straight line inside the trench by the first number, under cover of the second number - the gunner.

It also explains the basic principles of movement in rooms where you have to sweep one at a time.

4. *The Infantry Maneuver Combat Block* includes those techniques of classical infantry tactics based on suppression of small arms fire that can be used, especially when fighting in forests or in the built environment:

4.1. Flank spread and incomplete center attack (6 block, pp. 143);

4.2. Right Angle Fire Support Attack (Para. 3.2, p. 85.);

4.3. Creeping attack with double salvo grenade throw (paragraph 4.2, p. 111);

4.4. Defense tactics (Unit 7, p. 151).

5. *"Police Tactics" block*. The name is tentative. It includes those tactical techniques that are not systematically practiced at present, but which may be useful for the development of new tactical knowledge. This block is only given if there is time and if the instructor has gained credibility with the trainees. This block may be

tacitly recognized as a training block.

the resistance of the trainees precisely because of the low practical applicability of these techniques in the current context:

5.1. Rolling attack with consecutive division into sub-groups (paragraph 4.3, page 115);

5.2. Attack on foot behind armored vehicles (Training Block 5, p. 129);

5.3. Fundamentals of maneuvering (Unit 1 of the training, page 15);

5.4. Formations and ways of unfolding (Unit 2, p. 51). It should be emphasized here that extended formations of the "chain" or "wedge" ("double wedge") type, etc., have lost some of their advantages over the "column of one" ("snakes") because of the mine hazard when approaching the enemy and the change in the main means of engagement. Deployed formations have advantages in sudden fire contact with enemy infantry firepower, but in conditions where the first strikes against a detected infantry formation are made not by infantry, but by artillery using cluster munitions, as well as by attack drones, the "column of one", which is less visible and easier to apply to linear objects (forest belts, roads and paths in vegetation, fences along streets), has certain advantages over deployed formations. It may be pointed out here that infantry tactics are determined not so much by the needs of small arms combat as by the need to minimize losses from the fire of other means of destruction, from tanks to attacking UAVs;

5.5. Getting into positions (Unit 8 of the training, p. 158).

The author does not claim that the proposed training scheme is the only possible one, but it seems to strike a reasonable balance between "direct applicability" and the transfer of background knowledge to the troops.

NRICOME 4.

Takutska nehohuiih aouak no onyuu CBO 2022- 2023 rr.¹

Materials on the attack tactics used, which have been made available to the public, demonstrate at least three "oddities" of foot attacks in the current war aimed at capturing enemy positions in trenches:

1) in the immediate vicinity of the trenches under attack, the attacking soldiers move at almost full height at a slow (!) pace, often stopping (!) on the spot to fire 3-7 meters from the enemy trench. When movement stops, they do not always move to the "lying down" position in the immediate vicinity of the enemy's trenches, often taking a "kneeling" or "kneeling" position or remaining in the position of "standing" barely ducked;

2) the assault is almost always along the trench, not from the front;

3) the approach to the attacked trench is made in a "crawl", i.e. practically in column, one at a time, without spreading out into a chain (wedge), and often such a "column" before the enemy trench is formed into a small crowd, when the front soldiers of the column stop and those behind still continue to move forward until they catch up with the soldiers who have stopped in front. If a landing is made from an APC/BMP, it is made 10-20 meters from the enemy trench (when landing from the stern of an APC/BMP, the side of the vehicle is often placed approximately parallel to the line of the trench, i.e. the infantry behind the stern at the moment of rushing does not take cover; not to mention the fact that soldiers often sit on top of the armored vehicle rather than inside it during the approach), and the soldiers who have dismounted subsequently approach the attacked trench in a "crowd" without moving to the lower level.

¹ This article was originally published in The Honorable One (2024, № 114, January, C. 10-13). Printed with minor clarifications.

This indicates that the density and effectiveness of the defensive fire in front of the front line of defense is extremely low, otherwise these actions would be simply impossible.

For the purposes of the following, this method of completing the attack will be referred to as "one column attack", although the convention of this term is clear.

In order to appreciate the unconventionality of what is happening, one must realize that **none of the existing tactical codes in the world provided for the possibility of closing an attack in this way**. In fact, all "statutory" ways of ending an attack can be divided into three groups:

a) a running throw in a chain, often after a volley of grenades, accompanied by automatic fire from the hip (conventionally "Soviet statutory", the British had a similar method in general);

b) fast marching in a chain with shooting on sight with short stops for aiming (conventionally "pre-Vietnam American", in general the Bundeswehr had a similar method);

c) crawling along an unshot corridor, i.e. crawling into a trench after laying (not throwing) a grenade into it, while suppressive fire is directed to the right and left of the trench entrance, and subsequently mopping up the trench from the inside with reinforcements passing through the same non-shooting corridor (a conventionally "Canadian" method, in general a similar method is now used by the Americans, except that not one but two soldiers are rolled into the trench at the same time).

Leaving aside the question of the conditions of applicability of this or that method, it should be noted that none of them provides for prolonged walking at full height ("sticking") in front of the enemy's trench, and even in a crowd. This is quite understandable - according to classical views of tactics, the zone in the immediate vicinity of the enemy's trench is the most dangerous because of the possibility of the defender's oblique (flank) fire, especially if it is dagger fire, and at the moment of the attackers' greatest vulnerability (in English-language sources, such fire is approximately parallel to the line of trenches in the immediate

vicinity of the enemy's trench).

The ability of the defenders to throw grenades in salvos and the fact that the attackers are close to the defender's trenches also plays a role.) The ability of the defenders to throw grenades in volleys and the fact that the attackers are close to the trenches of the defenders makes them relatively easy targets.

The classical view of infantry combat considers it inadmissible to be in column during combat, since in this case the unit runs the risk of being exposed to longitudinal (enfilade) fire from the front from machine guns along the column, the increased effectiveness of which is well known. In World War I there was an exception to this rule. When oblique (flank) machine-gun fire became the defense framework for all warring parties, the risk of getting hit by longitudinal (enfilade) fire from the flank became higher than getting hit by such fire from the front. Formation in columns became preferable. The author of these lines was explained to me in the current conditions as follows: if you walk in a chain, a machine-gun burst will knock out the whole chain, but if you walk in a goose", only the first few soldiers in the column will be hit, and the rest will be able to lie down. It should be noted that the factor of exposure to small arms fire is of little importance in the choice of attacking formation under current conditions. Mine danger, low visibility of the formation, and the greater applicability of the column to linear objects on the ground are more important factors.

Here we also note that the emerging publicly available material shows **almost complete disregard for "This applies both to Russian (modified Soviet) charters and the notorious NATO standards (platoon hasty attack battle drill/battle drill #1 [battle algorithm of attack]. This applies both to Russian (modified Soviet) charters and the notorious NATO standards (platoon hasty attack battle drill/battle drill #1 and its equivalents) in the Ukrainian version. Why this happens is beyond the scope of this article. It can be explained by the low level of training of military personnel, by the mismatch between the conditions of application of the statutory methods and the current situation, or by the low realism/integrity of the training process, when after the classes the**

overloaded trainee understands only what he is taught,

it is definitely not possible to act. From the practical point of view of the manuals, it can be said that it does not. This issue deserves a separate discussion and, again, is beyond the scope of this article, especially since it has the potential to undermine the entire system of training based on the authority of the combat .

There is a striking disconnect between combat practice and the normative requirements of the governing documents, and it seems practically important to focus on two facets of problem: 1) the causes of the proliferation of one-on-one attacks and 2) the changes in tactics and training associated with the proliferation of one-on-one attacks.

Of course, the easiest thing to do would be to dismiss this combat practice and attribute the occurrence of "one-at-a-time attacks in column" to bilateral untrained troops and ordinary stupidity. However, this does not seem quite right. There are some **objective factors**. Let us consider them.

1) The fact that most positions are located in wooded areas with large fields between them (1-1.5 km between plantations) or in forests means that to establish a system of effective oblique (flank) fire requires so work to clear sectors of fire that it is simply impossible to do so given the forces and time available. The field in front of a landing is well covered, but an enemy entering a wooded area is out of sight to the flanking defensive firepower. To allow such a firepower to penetrate the area in front of the plantation, it must be moved out of the plantation and made easily detectable and, consequently, destroyed. In certain cases, the clearing of sectors for oblique fire is even undesirable, since the camouflage properties of the plantation will be lost. On the other hand, for attackers there is almost always a convenient hidden approach to the flank of a defended position either through a perpendicular woodland or from the opposite side of such a perpendicular woodland, far from the woodland where the defender is located. The woodland makes it very difficult for defensive support to fire from the rear, since the attackers are poorly visible

from tactical depth is hindered by the same wooded area in or near which the defender's trenches are located. In addition, the increased possibilities of UAV surveillance and artillery fire correction and, to some extent, the use of UAV ammunition drop systems and kamikaze drone strikes hinder the removal of trenches from the wooded area and their location in the open field. If the trenches are not covered from above (and there simply may not be enough materials, time and effort to do so), those in the trench will be knocked out fairly quickly. A return to the practice of canopies over trenches in World War I was not always possible due to the lack of resources in the broad sense of the word for their construction. Defense in a forest clearing can be compared to defense on the edge of a forest, but the problem is that positions are not usually recommended on the edge of the forest, but in the depth of the forest. However, in the case of forest plantations these recommendations do not apply. There is simply no depth. It seems that the current war has once again created a situation in which some rules that were considered universal have turned out to be inapplicable in a particular case.

2) The second factor is the insufficient attention paid by commanding documents to the preparation of a defensive position for close defensive combat at ultra-short ranges. Traditionally, defensive positions are prepared on the basis of the need to stop the enemy's attack at relatively distant lines. Doctrinally, there are two approaches to the remoteness of such lines. The domestic tradition is based on opening fire on the attacking enemy as he approaches within the range of the actual fire of the defender's weapons, i.e. practically at the maximum range for the given conditions. Tactical views in a number of foreign countries (for example, the German tactical school) prescribe opening fire when the attackers enter the zone of maximum effectiveness of the defender's fire, i.e. practically from 100-150 meters. This range of fire, in addition to exploiting the effect of a sudden close fire attack, significantly limits the support of the attackers with heavy weapons fire because of the proximity of their soldiers to the defender's positions.

In both approaches, the defensive positions are designed to stop an attack primarily at a distance. In both approaches, however, the defensive positions are designed to stop the attack, primarily at a distance. The expectation is that the attackers will usually refuse to continue the attack if they suffer significant losses during the advance phase. Little attention is paid to defensive combat at distances of 3-7 meters, when the attacking enemy has managed to get to a super-short distance. The defensive position is often simply not convenient for defensive combat at such ultra-short ranges. A major problem is created by large and high berms, often dug out by heavy equipment that simply cannot technically make berms of the statutory size. This creates many blind spots where the attacker can move relatively freely and the defender is constrained by the trench line. Means of directing oblique (dagger) fire are seldom provided. There is little or no minimization of closures convenient for attackers near defensive positions. As a result, unless the attacking enemy is forced to abandon the attack by distant fire, it is extremely difficult to repel an attack at ultra-short ranges, and attackers can afford to move slowly at full height directly in front of the defending enemy's trench.

3) Another important factor is the effectiveness of artillery preparatory fire through UAV fire correction and the ability to adjust small arms fire in real time, small arms, AGS and small-caliber mortars to individual defensive positions (rifle cells/ammbrasures) using UAVs, which multiplies the probability of knocking out the most significant defensive firepower, as well as the use of UAV ammunition-dropping systems when preparing and escorting an attack. A widespread practice is the use of a UAV moving in the air in front of a trench-clearing team, whose operator provides detailed information about the location of the defending soldiers and their firepower directly to the front two or three trench-clearers, and, if possible, from such a UAV.

The UAVs drop incapacitating munitions. As a result of the impact of these factors, the defending forces, which are initially small in number due to the high degree of thinness of the combat formation characteristic of the current conflict, are knocked out a significant number of soldiers and firepower for a given defensive position. It turns out that the defense of a platoon's position has to be carried out by three or four soldiers. Of course, there is question of any system of fire, including oblique (dagger) fire or volley grenade throwing. Defensive combat is reduced to self-defense of those few fighters who remained combat-ready in the trench. This factor also reduces the risk to the attackers of being at full height in the immediate vicinity of the defender's trench.

To summarize, it should be noted that a zone 3-7 meters from the trenches of the defenders when standing practically full height in it and moving in column one at a time, due to the terrain and the low density of the defenders in the current war conditions, is not as dangerous as the authors of guidance documents around the world foresee, which makes "attacks in column one at a time" possible. We emphasize that this conclusion does not suggest that such attacks are preferable conventional attacks. It merely states that they are possible, which is what we see in practice.

So, assuming that "attacks in column one at a time" are actually used, it is necessary to outline how **this fact should be taken into account in tactical training**:

1) It is necessary to train personnel to conduct defensive combat in very thinly spread combat formations. The task of defending a combat three or four in a trench for a squad or even a platoon should be practiced as standard. This includes opening corners, moving in the trench with changing guides, group grenade throwing, entering and leaving the trench through the berm and loopholes, withdrawal and offensive rolling over the trench, etc.;

2) In the engineering preparation of defensive positions, the need for distant firing must be taken into account,

and firefighting in the strip immediately adjacent to the trench itself (0-20 meters from the trench berm), including positions for oblique (dagger) fire;

3) In engineering equipment of the trench, special attention should be paid to possible counteraction to longitudinal clearing of the trench, namely, in the broken line of trenches to make loopholes designed for shooting along the trench, as well as places of exit from the trench through the bumper;

4) It is necessary to strive to cover the trenches from above, at least from UAV observation using fabric materials, and ideally from UAV-dropped munitions, despite the objective difficulties of solving this problem. It seems that the covered section of the trench should have cells buried in the wall of the trench, so that the drop of UAV munitions near the entrance to the covered section of the trench (which is not difficult and is widely used practice) does not result in casualties to the personnel who have taken cover. It should be emphasized that covering a trench (cell) from above, without protection from the fragmentation of a UAV-dropped impact munition near the entrance to the covered area, is not sufficient by itself. If the underbelly recesses are protected by timbers angled to the trench wall and resting on the wall (as if forming a single-slope "tent"), they must be deep enough to ensure that a munition dropped near the entrance will not injure those in the recess.

With regard to the tactical expediency of "attacking in column one at a time", the following may be noted. Opening into a chain (wedge) on approach and entering a trench after a volley of grenades thrown by the whole chain or through an "unshot corridor" seem intuitively safer from the point of view of purely infantry combat. However, not everything is determined by the rules of such combat. In real battles, UAVs, armored vehicles, and various mounted fire systems interact with infantry. At the moment, there is no data for an objective comparison on this issue, since no one the statutory methods of ending attacks. At least, there is no information about it. B such

The situation is a matter of theoretical speculation. One can argue about it endlessly, but it is impossible to draw a reasonable conclusion. From the point of view of combat training, it seems reasonable to teach the "statutory" ways of ending an attack and to explain how a "column attack" is carried out one at a time.

To conclude, we note that this article is based on a sample of materials that came to the author's attention, and this sample may not be representative. However, we hope that the discussion of this issue in the future will help to develop an informed position as more information becomes available. If this article advances the debate on this issue to some extent, we will consider the task of this article accomplished.

NRICOME 5.

The main goal of the program is to improve the quality of life of the people in the armed forces

Failures in the conduct of combat operations are often attributed to political and operational-strategic miscalculations by the highest political and/or military leadership. This is quite clear, simple and obvious. Attributing errors to specific individuals can be directly used in the political sphere, which provides concrete utility in terms of personnel decisions. However, after sufficient time has elapsed since the onset of large-scale combat operations, it is also necessary to try to examine general patterns of army mechanism that are not linked to specific officials. Some appointees may leave sooner or later, and problems, if they are systemic, will remain even after their departure.

One of the problems that became apparent in the course of the NWO is the difficulties in training military units. The manifestations of these difficulties will be discussed below, but it should be emphasized here that it is not only and not so much the initial lack of training, but the difficulties in training personnel during combat operations themselves. For example, poor training during mobilization can be attributed to a lack of time for combat training. Commanders have to make a difficult choice between plugging holes at the front with any units and properly training units in the rear. In such a situation, the use of systematically untrained units may be somehow justified. However, if after months of being in positions, albeit in the second echelon and even further in the rear, units do not receive sufficient military knowledge, then there is a question of systemic training problems.

Let us hypothesize that difficulties with training are related to the intra-organizational ("corporate") culture that has developed in the army. Rituals and rituals have acquired a significant place in the army, with the reduction of work for the result (achieving victory in war or preparing for such a victory in peacetime). The closest analog to the state of internal army culture is pagan cults, in which the ritual side is dominant. In pagan mystical thinking, external rituals are required to receive benefit or support from spirits. The preservation and observance of the ritual side becomes self-sufficient, self-purposeful and self-valuable. A correctly and systematically performed ritual should automatically produce the desired result. It should be noted that developed religious systems, at least at the level of dogmatics, move away from the sufficiency of the ritual side and require from their adherents a great deal of inner intellectual work, leaving the ritual a supporting, auxiliary role.

The comparison of army culture with pagan culture may seem strange at first glance. However, when examined in detail, there are many common features. In the army

The "supreme power" becomes the maintenance of hierarchy (maintaining structured subordination for the sake of subordination itself), the appearance of power, the unquestionable infallibility of actions in order to maintain authority. Such maintenance becomes an end in itself and self-valuable, even if it is contrary to objective necessity. The internal culture preserved in the Russian army is more suited to the tactics of closed infantry formation, which already in the last third of the 19th century began to be supplanted by open (scattered) formation tactics, which required wide autonomy for the actions of smaller and smaller units.

As a general cultural norm for the army, the following rule can be derived: training of personnel is only carried out to the extent that the training of troops does not jeopardize the maintenance of formal and informal hierarchies in the military. It should be understood that the more trained the troops are,

the greater the demands placed on leadership and more difficult the task of keeping people in line becomes. If the path of least resistance is followed, the risks posed by troop training should be minimized by keeping combat training as low as possible.

The following logic also works: combat training is work, and work is a punishment that lowers the status in the hierarchy, so it should be avoided. Of course, this contradicts the real needs of the military body: troops should be trained as much as possible, as far as the material and technical base and the time available allow. However, this is where mystical thinking kicks in, allowing the real needs to be bypassed and substitute rituals to be used to achieve what seems to be the same result. Maintaining the ritualized army tradition becomes the predominantly used mechanism.

Further we will consider the manifestations of such a mechanism. Looking ahead, we will say that they are negative in nature. Here we should make a reservation that military rituals and traditions can have a positive aspect. For example, formation training, which is currently needed mainly for parades and buildings, is a tool for psychological bonding of the military team and training to obey orders. Reading the heroes of the past can increase psychological resilience in combat by providing role models. However, it is always a question of the degree of intensity of a factor. What is good in moderation is often harmful when abused.

Consider the learning difficulties that emerged in the course of the SWOT.

1. Low ability to train military units in the combat zone, especially those composed of mobilized personnel. It would seem to be a feasible task: periodic rotations are organized, units or even individual groups of soldiers are withdrawn to the rear, and they are relieved of their duties in the field.

given the static nature of the front line. Given the static nature of the front line, this should not present insurmountable difficulties. As a matter of fact, any commander should have a reserve to deal with any surprises on the front line. Training can be done while in reserve. However, in reality, administrative and welfare duties will always be favored. Soldiers are always busy on duty, and when they are not busy, they rest from duty. They are not engaged in combat training because they are tired. This practice is absurd, but it does take place. Maintaining a typical peacetime routine through the system of dress-up is the very ritual that is performed in spite of the screaming demands of combat reality.

2. *Ignoring the internal logic of the tactical schemes outlined in the combat manuals.* If we look at the actual methods of attack in use, they have nothing to do with the tactical elements of the "end-to-end" attack scheme, which is the basic scheme of the current combat manuals. There is no exit during artillery preparation to the line of safe distance from the bursts of their shells of tanks (200 m from the enemy) and APCs/BMPs (300 m from the enemy), followed (immediately after the transfer of artillery fire deep into the enemy's defense) by the tanks dropping speed in order to allow the APCs/BMPs to catch up with the tanks and to rush the soldiers. The actual attack patterns used are based on the ability to enter enemy positions on foot (often in a single column) or to dismount from armored vehicles right in front of the enemy's axes. This can be done if the artillery and drone training practically knocks out most of the firepower and personnel of the defenders. The scheme of "through attack", at least in theory, also works when the enemy is temporarily suppressed. There is an informal agreement among the troops that in conditions of mass use of UAVs and a transparent battlefield, the statutory "end-to-end attack" is not applicable. Consideration of the question of which method of attack is the

Whether the emerging combat practice is a new development or a mistake due to ignorance is beyond the scope of this article. Here it is important to pay attention to something else - the apparent discrepancy between what is written in the guiding documents and the combat practice in the army environment does not raise any questions. The fact is that no one considers studying combat manuals or even practicing the actions stipulated in them as a way of preparing for combat operations. It is merely a ritual that tests readiness to follow established rules that are consistent with the internal army culture. Additionally, regulations create a mechanism for controlling one's place in the hierarchy by allowing one's knowledge of the text to be tested without any regard to its actual usefulness in a combat situation. True combat experience and real training live on in the oral tradition.

3. relatively weak system of generalization and transfer of combat experience. Here are some examples.

The widespread use of UAVs to drop munitions and kamikaze UAV strikes, as well as direct escort of trench-clearing teams to transmit in real time the mutual location of the defending enemy and the attackers, has led to the requirement for mandatory interval trench closures against at least overhead observation, and better against the detonation of light munitions (hand grenades, automatic grenade launchers, and small caliber mines). Despite the fact that information about this became publicly available quite a long time ago, and videos of our soldiers being hit by the above-mentioned method have flooded telegram channels and pages on the Internet, over-head trench closures are being implemented to a limited extent.

It is known about the use of the "traveling circus shapito" system by enemy UAV units. The idea is that a UAV unit is assigned to a certain section of the front, using certain vehicles, frequencies and a certain sequence of actions. Until our units get used to it and work out countermechanisms, the UAV unit will not be able to fight back

of the enemy are engaged in combat operations in that area. Then, when the effectiveness drops, such a UAV unit moves to another section of the front. And the situation repeats - it is almost guaranteed that in the new section our troops will not know about the tactics and techniques of the enemy UAV unit. Horizontal information transfer is poorly organized.

It should be understood that one of the pillars of learning by sharing combat experience involves recognizing previous mistakes. However, recognizing one's own mistakes can undermine command authority. This sets the stage for default, which, while resulting in increased casualties, does not seem to outwardly attack the credibility of the organization.

4. Following patterns without understanding their purpose. When constructing defensive lines in the rear of our defenses, the requirements for the convenience of defensive combat using them are almost completely ignored. The trenches are dug out by heavy construction equipment so that their huge bunkers significantly reduce the number of positions from which it is realistic to fire at the attacking enemy, creating a mass of unshootable (dead) spaces. Bunkers effectively deprive infantry of the ability to fire at the enemy, except for a very small number of embrasures, which are easy for the enemy to suppress. Nothing is done to prepare for defensive combat against trench clearing teams penetrating the trench system. There are examples in the guiding documents of equipping platoon and company strongholds, trenches per squad. However, if one tries to build something similar to the drawings without understanding what the size and outline of these positions are related to, one can ignorantly do much harm to one's own escalating troops. Nevertheless, the military specialists who supervised the preparation of defensive lines by civilian construction organizations were only concerned with the outward resemblance of the dug-out positions to what was depicted as examples in the guiding documents. The root cause has already been outlined above. In accordance with the current military culture, the engineering preparation of positions is not done for combat, but

is a choice of

The design and size of the defensive positions when they are constructed is a ritual of loyalty to the existing system of relations within the army.

5. *Silence about negative information in order not to frame "their own"*. Here I will cite perhaps the most egregious example, although there are presumably many similar situations. In one section of the front, repeated attempts were made to call in air support for our troops. The aircraft did not arrive. When attempts were made to find out what the reason was, it turned out that on army maps the front line was 15 (!) kilometers deeper towards the enemy than it was in reality. Of course, the aviation chiefs regarded the call of the air force to positions which, according to the maps, were deep inside our defensive positions as an obvious mistake. However, it is not even the fact of such a mistake that is important, although there is little doubt that it was caused by blatant lies about the advances of our troops. What is important is that even after the discovery of such an error it was not immediately corrected. Such correction can only be done in a way that does not undermine the authority of the existing hierarchical system of management. again, the hierarchy itself proved more important than the actual combat needs. Everyone makes mistakes, and it is important that mistakes are corrected as quickly as possible. Maintaining authority for its own sake is evidence of the deep archaic nature of the prevailing army culture.

Unfortunately, the above list is not exhaustive. Many authors have addressed the problem of erroneous military decisions in world military science. One example is Norman Dixon's classic work "On the Psychology of Military Incompetence" or Norval de Atkin's "Why Arabs Lose Wars"¹. Such works demonstrate that the underlying causes of

¹ *Norman Dixon*. On the psychology of military incompetence. Burnemaus, Door- set; Pimlico; 1994. [*Norman F. Dixon*. On The Psychology Of Military Incompe- tence. Bournemouth, Dorset; Pimlico; 1994.]

The problems in the conduct of combat operations lie beyond purely military logic and are often linked to the traditions and social structure of the respective armies. This is a very painful issue, as it affects at least the patriotic feelings and often the self-respect of people in uniform and ordinary citizens. However, to eradicate problems and shortcomings, it is systemic errors, not related to individuals, that need to be studied. It is easy to overlook the mistakes of certain commanders without seeing the flaws of the army system as a whole.

At the present moment, while the NWO is underway, this problem must be solved by the efforts of society as a whole. There is not much hope for a prompt correction of this problem from within the army alone. Army traditions make this difficult to realize. The tremendous support provided by authorities at all levels, the media, volunteers and other representatives of civil society should include not only the logistical component, but also elements related to the training of troops. A good example is the assistance of civilian enthusiasts to the army on UAV-related issues. Combat application of different branches of the armed forces, tactical issues should be the next areas in which civil society should assist soldiers fighting on the front lines.

Norvell de Atkine. Why Arabs lose wars [Norvell de Atkine.
Why Arabs lose wars // Middle East Quarterly. Vol. 4. 1999. December. № 4.]