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METHODOLOGY FOR CALCULATING THE INTEGRAL COEFFICIENT OF INTELLIGENCE PROTECTION OF ARMORED VEHICLES OF THE SECURITY AND DEFENSE FORCES OF UKRAINE

A new methodology for determining the integral coefficient of reconnaissance protection of armored vehicles of the Security and Defense Forces of Ukraine is presented. The methodology accounts for multispectral signature characteristics and operating modes of radio-technical systems, including electronic warfare complexes and counter-radio-controlled munition systems. It is shown that the intensive development of optical, infrared, radar, thermal, acoustic, and radio-technical reconnaissance by the adversary significantly increases the probability of detecting armored vehicles, thereby reducing their combat survivability. The proposed model is based on the weighted aggregation of partial detectability coefficients and enables quantitative assessment of the level of reconnaissance protection under various combat employment conditions. The methodology can be used for comparative analysis of armored vehicle platforms, optimization of operating modes of radio-technical systems, improvement of camouflage measures, and enhancement of the effectiveness of counter-radio-controlled munition complexes within the framework of ensuring the state security of Ukraine.

Keywords: *state security, security provision mechanism, security and defense forces, armored vehicles, reconnaissance protection, counter-radio-controlled munitions, unmanned aerial vehicles, detection, acoustic vibration, impact, diagnostics, protection, coefficient, monitoring, spectral analysis, reconnaissance signatures, radio-technical detectability.*

Statement of the problem. The results of the analysis of combat operations on the territory of Ukraine indicate the rapid development and intensive employment of technical, radio-technical, electro-optical, and unmanned reconnaissance assets by the adversary, which significantly enhances its capabilities for detecting and engaging defense forces [1, 2]. This creates complex threats to military units, particularly when armored vehicles are used as the primary means of fire support for assault, maneuver, and security operations [3]. Signature characteristics generated during engine operation, vehicle movement, use of communication systems, electronic warfare assets, as well as the employment of counter-radio-controlled munition (C-RCM) systems and firing activities, directly affect the probability of detecting armored vehicles by various adversary reconnaissance means [1, 2]. Under conditions of multispectral surveillance (optical, infrared, thermal, radar, acoustic, and radio-technical), the reduction of reconnaissance detectability becomes one of the key factors in ensuring the combat survivability of armored vehicles. In modern

warfare, reconnaissance protection defines the initial stage of the "kill chain" [17, 20], since the probability of detection determines the subsequent probability of engagement, penetration, and loss of combat effectiveness of armored vehicles.

Thus, a scientific and practical problem arises, the essence of which lies in the lack of a comprehensive methodology that would allow for the quantitative assessment of the relationship between multispectral signature characteristics, operating modes of radio-technical systems – particularly counter-RCM systems – and indicators of armored vehicle combat survivability, as well as linking the obtained results to mechanisms for enhancing state security [4].

Analysis of recent research and publications. In contemporary research, the combat survivability of armored and automotive equipment is predominantly addressed through probabilistic models of detection, engagement, penetration, and loss of combat effectiveness, as reflected in a number of studies. In particular, the publication by O. Ivanchenko et al. proposes a generalized

survivability indicator for armored vehicles [5]. Further development of methods for assessing the survivability of armored vehicles is presented in the works of S. Kudimov, V. Tabunenkov, R. Kaidalov, and their colleagues, who defined criteria and algorithms for calculating the level of vehicle preservation depending on combat conditions, intensity of fire impact, and parameters of destructive means [6, 7]. The studies by T. Stakh expand the scientific basis for forming integral survivability indicators by accounting for structural, operational, and combat-related factors affecting the resistance of vehicles to damage [8]. A synthesis of these results indicates the existence of a well-developed framework for assessing the combat survivability of armored vehicles; however, most studies do not consider the specific influence of operating modes of radio-technical systems, including electronic warfare complexes and counter-radio-controlled munition systems, which significantly alter the level of multispectral signature characteristics of vehicles and, consequently, the probability of their detection by the adversary. The omission of these operating modes in existing methodologies necessitates a scientific solution to this problem.

A wide range of methods and techniques for camouflage of combat equipment, including armored vehicles, as well as various forms of reconnaissance actions against it, are well known. Combat regulations [3, 4, 9] define procedures for mechanized and tank units, fundamentals of reconnaissance, and requirements for tactical camouflage; however, they lack detailed consideration of multispectral detectability of equipment under modern battlefield conditions. Studies [10, 11] focus primarily on methods of military reconnaissance and characteristics of armored vehicles, yet do not disclose the mathematical framework for forming signature characteristics and their relationship with the probability of detection and engagement. Requirements for camouflage painting and engineer camouflage of equipment are established in [12]; however, the effectiveness of these measures is not evaluated in comparison with the capabilities of modern adversary reconnaissance assets, nor is the impact of active radio-technical systems (electronic warfare and counter-radio-controlled munition systems) considered, despite their significant contribution to increased reconnaissance detectability of equipment.

Thus, the analysis of scientific sources indicates the lack of a comprehensive approach that would encompass: multispectral signature characteristics

of armored vehicles; the influence of operating modes of radio-technical systems, particularly electronic warfare and counter-radio-controlled munition systems; the relationship between reconnaissance protection and combat survivability of equipment; and the formal mathematical representation of these processes within a unified evaluation methodology. This set of scientific gaps determines the relevance of the study and substantiates the need for the presented research.

The purpose of the article is to develop a methodology for determining the integral indicator of reconnaissance (counter-reconnaissance) protection of armored vehicles of the security and defense forces, taking into account multispectral signature characteristics.

Summary of the main material. The experience of repelling the armed aggression of the Russian Federation by the Security and Defense Forces of Ukraine has convincingly demonstrated that one of the key factors determining the level of combat survivability of armored and automotive equipment (AAE) is its counter-reconnaissance (reconnaissance) protection. The development of adversary aerial, ground, radar, electronic, thermal, and acoustic reconnaissance assets, as well as the mass employment of unmanned aerial vehicles of various types, has led to a sharp increase in the probability of detecting Ukrainian equipment on the battlefield [5, 6, 7, 10, 11, 18]. Recorded cases of enemy engagement of combat vehicles were predominantly preceded by their timely detection, indicating a direct causal relationship between the level of reconnaissance detectability of AAE and actual combat losses.

Despite the critical importance of this factor, scientific studies and practical methods for assessing the effectiveness of combat equipment still lack a formalized, quantitatively defined integral indicator of reconnaissance protection that would comprehensively account for multispectral signature characteristics of equipment, operating modes of radio-technical systems, and the impact of counter-radio-controlled munition (C-RCM) measures. This complicates objective comparative assessments, determination of optimal employment modes, and the formulation of scientifically substantiated decisions aimed at increasing unit combat survivability within the operational theater.

In general terms, the concept of "counter-reconnaissance (reconnaissance) protection of armored and automotive equipment" is defined as the capability of AAE to resist adversary reconnaissance. For the purposes of military-

scientific analysis, an expanded and detailed definition is introduced to reflect the multi-component nature of this indicator.

Counter-reconnaissance (reconnaissance) protection of armored and automotive equipment is an integral property that determines the ability of AAE to remain low-observable and difficult to detect by adversary reconnaissance assets across optical, infrared, radar, acoustic, vibration, and radio-technical bands, as well as to counter the disclosure of its combat capabilities, location, and intentions during the execution of service-combat tasks.

This formulation provides a foundation for reconnaissance protection and the construction of integral indicators that enable assessment of its impact on the combat survivability of AAE and the objectification of decision-making processes regarding equipment modernization, improvement of tactical employment techniques, and development of C-RCM systems.

The assessment of reconnaissance protection of AAE is formalized by defining an appropriate coefficient based on the probability of detection, taking into account the tactical and technical characteristics of the equipment. This approach allows a quantitative evaluation of equipment vulnerability under specific combat conditions, which is critically important for effective operational planning.

The reconnaissance protection coefficient depends on the diagnosis (monitoring) of the conditions of AAE employment and should account for:

- the type of combined-arms combat (e.g., offensive or defensive actions);
- the type of activity (maneuvering, march, concentration);
- the phase of combat employment (movement in column or battle formations, deployment, stationary combat operations, etc.);
- participation in combat support tasks (including within security, support/logistics, or reserve units);
- the tactical situation (terrain relief, natural-geographical zone, availability of cover, weather conditions, season, time of day).

The concept of reconnaissance protection of combat equipment is central to further analysis; therefore, its essence is considered in greater detail. Reconnaissance protection of combat equipment is the aggregate capability of an AAE sample to reduce the probability of its detection, recognition, and target designation under combat conditions

[12, 15, 20]. It is formed through camouflage measures, reduction of signature characteristics, the use of engineering means, as well as organizational and tactical measures [13]. Reconnaissance protection is determined based on the physical signatures of the object – optical, infrared, thermal, electromagnetic, radar, acoustic, seismic, etc. [14, 15, 22].

The assessment of reconnaissance protection of AAE is proposed to be carried out using an integral indicator that includes coefficients of reconnaissance detectability dependent on factors influencing equipment observability, among which the following play a significant role:

- the acoustic detection coefficient, characterizing the noise level generated by equipment during movement or operation of weapon systems;
- the vibration coefficient, characterizing equipment movement – especially on paved roads – and operation under camouflage means.

At various stages of preparation and conduct of combat operations, the employment of AAE is a key factor in ensuring high combat capabilities of units, especially assault units. Therefore, it is important to ensure the required level of reconnaissance protection of AAE samples to preserve them during combat operations. To this end, monitoring of signature characteristics is necessary.

During the execution of combat tasks, issues of tactical camouflage are usually addressed in accordance with provisions [10, 15, 16]; however, these lack clear mathematical substantiation. Commonly accepted methods of tactical camouflage include concealment and camouflage, imitation, demonstrative actions, and deception [17, 18].

The implementation of these camouflage measures requires appropriate technical support. The main indicators of AAE combat capabilities – firepower, maneuverability, and strike potential – are realized through physical processes that may be perceived by the adversary as signature characteristics (or, in some contexts, as sources for deception).

Firepower capabilities characterize the ability of AAE to engage adversary targets according to the following parameters: combat rate of fire; effective firing range; firing accuracy (probability of hit); and the lethality of munitions.

When firing standard AAE armament, a shot is accompanied by physical phenomena that also constitute signature characteristics:

1) acoustic signature – the noise of the shot, the sound wave from the propellant charge explosion or the operation of automatic mechanisms;

2) vibration signature – vibration of the vehicle and weapon elements, including camouflage means;

3) thermal signature – local heating of the barrel due to firing, detected by thermal reconnaissance systems;

4) optical signature – smoke from propellant combustion and visually observable muzzle flash, especially at night (the luminous component of the optical signature) [19, 20].

In addition, persistent visual signatures include the overall dimensions and color of armored vehicles.

Maneuverability properties are determined by the capability of equipment to move in battle formations, including during marches and within marching security units. Under such conditions, additional signature characteristics manifest. The results of diagnosing (monitoring) the impact of signature characteristics made it possible to form groups of signatures.

Acoustic and vibration signatures. These arise from the operation of the engine, transmission, and tracks (or wheels). Sources include diesel or turbine engines; running gear (especially tracked propulsion); noises and vibrations of armor and mechanisms during gear shifting and turning. Detection means include adversary acoustic sensors (ground-based or airborne), audio recording, or directional localization of noise or vibration sources. A notable feature is the high noise level, which during movement can reach 90–115 dB, enabling detection at distances of several kilometers [16, 21].

Thermal signature. Causes include infrared radiation from the engine, exhaust system, and transmission. Sources include heated hull areas in the engine-transmission compartment; high-temperature exhaust gases; heating of running gear. Detection means include thermal imagers (ground-based or airborne, including UAV-borne), night-vision devices, and satellite IR reconnaissance. A key feature is the persistence of the thermal signature long after the equipment stops (thermal inertia).

Optical signature. Causes include visual observation of equipment geometry or its tracks. Sources include overall contours (especially from above); tracks from running gear (tracks or tire marks on soil, snow, grass, etc.); dust plumes when moving over dry or loose ground. Detection occurs

visually, via optical devices (including from altitude), and by daylight cameras. A notable feature is that tracks may indicate direction of movement, group composition, and equipment type.

Light (visual-contrast) signature. Sources include changes in contrast against the background: glare from unpainted or wet armor elements; disruption of shadows/contours during movement; reflections from instrument glass or headlights (even during daylight). Detection occurs visually and via optical devices, as well as by optoelectronic systems through contrast analysis. This signature is particularly dangerous in open or flat terrain.

Mechanical signature. Sources include physical traces of interaction with the surface (soil): broken or pressed vegetation; disturbed snow or soil layers; ruts and compacted ground. Detection occurs through aerial observation and reconnaissance patrols. A notable feature is the long persistence of such traces after passage of equipment.

Diagnosing (monitoring) the influence of terrain relief is a critical factor: each firing position may have its own value of the reconnaissance protection coefficient (RPC). This coefficient is used to model the probability of equipment detection depending on its signatures across different spectral bands, for example during spectral analysis of noise or vibration [21]. During the organization and execution of area deployment or guard duties, mechanized (assault) units supported by AAE perform tasks related to preparation for combat or restoration of combat effectiveness after engagements. Equipment (AAE) not engaged in guard duties and located in concealed parking within a unit may have a high level of reconnaissance protection (maximum RPC). Conversely, significantly lower protection levels are observed for AAE operating within guard formations (minimum RPC).

The employment of onboard radio-technical systems – particularly electronic warfare complexes, C-RCM systems, and communication equipment – significantly affects reconnaissance protection by creating additional electromagnetic, thermal, acoustic, and optical signatures. Operation of transmitters, antenna systems, and jamming generators increases radio-technical detectability, making equipment susceptible to detection by adversary radio-technical and radar reconnaissance assets [17, 20]. Simultaneously, increases in thermal, vibration, and acoustic signatures caused by high-power radio-technical complexes enhance

detectability in infrared, seismic, and acoustic bands. Accounting for these adverse effects requires introducing a radio-technical detectability coefficient as a corrective parameter reflecting the reduction of the integral level of reconnaissance protection during the operation of EW systems, C-RCM measures, and communication systems.

Thus, the application of camouflage means and measures during combat and special tasks requires significant effort, enabling a tangible reduction in detection risk.

For the integral calculation of the reconnaissance protection coefficient of combat equipment, a weighted sum of partial indicators of the mathematical model is used (protection coefficients: acoustic K_a ; thermal K_t ; optical K_o ; infrared K_i ; radar K_r ; vibration K_v , radio-technical K_{rt}):

$$K_{int} = w_1 \cdot K_a + w_2 \cdot K_t + w_3 \cdot K_o + w_4 \cdot K_i + w_5 \cdot K_r + w_6 \cdot K_v + w_7 \cdot K_{rt}, \quad (1)$$

where w_i is the denote the weighting factors representing the relative contribution of each signature type to the total reconnaissance detectability of the equipment.

The weighting coefficients of model (1) are proposed to be determined based on:

- empirical research data on the effectiveness of equipment detection in different environments (forest, urban, open terrain);
- results of field trials presented in publicly available NATO reports and scientific studies;

– expert assessments provided by specialists in tactical reconnaissance and counter-detection measures [15, 22].

Let us consider the procedure for determining the weighting coefficients of the reconnaissance protection coefficient (RPC).

The normalization procedure for the weighting coefficients is performed as follows:

$$w_i = \alpha_i / (\alpha_1 + \alpha_2 + \dots + \alpha_7), \quad (2)$$

where α_i is the represents the expert-based weighting of each factor's influence, conditioned by the combat scenario, terrain features, characteristics of the armored and automotive equipment, radio-technical assets, and other operational parameters.

Model expression (1) and expression (2) are supplemented by incorporating a vibration component, which also accounts for vulnerability to seismic reconnaissance assets. This direction is becoming increasingly relevant under conditions of employment of seismic sensor systems such as "Penicillin" and analogous systems. Consideration of this parameter is consistent with multi-aspect reconnaissance approaches in accordance with MASINT standards, as defined, for example, in STANAG 4716.

Table 1 presents the recommended values of the weighting coefficients of signature characteristics calculated using expression (2).

Table 1 – Weighting Coefficient Values for Signature Characteristics

Detection Type	Coefficient	Value	Remarks
Acoustic	K_a	0.18	Engine noise, firing
Thermal	K_t	0.13	Barrel heating, exhaust
Visual	K_o	0.12	Dimensions, color, muzzle flash
Infrared	K_i	0.12	IR radiation of the hull
Radar	K_r	0.11	Reflection of radar signals
Seismic	K_v	0.11	Vibrations, including those detected by seismic sensors
Radio-technical	K_{rt}	0.23	Radio-frequency detectability

Let us formulate a methodology for calculating the integral coefficient of reconnaissance protection of armored and automotive equipment of the Security and Defense Forces of Ukraine.

Step 1. Determination of AAE employment conditions.

External conditions affecting the level of reconnaissance detectability are assessed, including: type of combat (offensive, defensive, march); phase (movement in column, deployment,

combat actions, standby/guard duty); terrain type (open, urbanized, forested); relief features (ravines, shelterbelts, hills, tank-dangerous directions); weather conditions, time of day, and season.

Purpose: to define the initial background influencing the intensity of signature characteristics.

Step 2. Identification of potential detection spectra.

All channels and spectral bands in which AAE may be detected are identified: acoustic; vibration (seismic); optical (visual); infrared/thermal; radar; radio-technical (radio reconnaissance, EW, radio monitoring); mechanical and track/trace signatures (considered in an advanced model if required).

Purpose: to form a complete list of signature characteristics.

Step 3. Diagnostics (monitoring) of AAE signature characteristics.

For each spectrum, the following are determined: sources of the signature (engine, transmission, barrels, antennas, exhaust); signature intensity (in dB, °C, W, GHz, dB/m, etc.); potential detection range; adversary detection means (ground-based assets, UAVs, satellites, sensors).

Data acquisition methods include laboratory and field measurements; video and spectral analysis (IR/UV/RF); operational diagnostics data; and combat employment results.

Purpose: to obtain initial numerical (or normalized) values for each signature.

Step 4. Normalization of partial coefficients.

For each spectrum, a partial detectability coefficient is defined: acoustic – K_a ; thermal – K_t ; optical – K_o ; infrared – K_i ; radar – K_r ; seismic (vibration) – K_v ; radio-technical – K_{rt} .

Normalization follows the principle: 1 denotes maximum detectability (worst case); 0 denotes complete non-detectability (ideal case).

Normalization methods may include linear, logarithmic, or expert-based approaches (when direct data are unavailable).

Purpose: to bring all signatures to a unified scale.

Step 5. Determination of weighting coefficients (w_i).

Inputs include expert assessments by reconnaissance specialists, artillery personnel, and AAE crews; statistics on equipment detection; and international standards (MASINT, STANAG 4716).

Procedure:

– experts assess the importance of each spectrum (α_i);

– normalization is performed [see expression (2)];

– weights $w_1 \dots w_7$ are obtained, summing to 1.

Purpose: to determine the contribution of each spectrum to overall detectability.

Step 6. Accounting for the impact of radio-technical systems (EW, C-RCM, communications).

A radio-technical detectability coefficient is determined for AAE, accounting for: transmitter

operation (band, power, mode); jamming generators; antenna system radiation intensity; heating of EW and C-RCM power units; and additional vibration due to equipment operation.

A correction factor is introduced to decrease (or increase) partial K_i values.

Purpose: to integrate the impact of active equipment not previously accounted for in scientific studies.

Step 7. Calculation of the integral coefficient K_i .

Expression (1) is used without reproducing the formula in the text; the article may reference it as:

"The integral coefficient of reconnaissance protection was determined using a weighted aggregation model of partial detectability coefficients [see expression (1)]".

The result $K_{int} \in [0; 1]$.

Interpretation: 0.00–0.30 – high reconnaissance protection; 0.31–0.60 – medium; 0.61–1.00 – low (equipment is easily detectable).

Step 8. Comparison of different employment conditions.

Analysis is performed for scenarios including: movement; stationary positions; engineered positions; firing; operation of EW/C-RCM; and different natural-geographical zones.

Purpose: to obtain risk maps and scenario-based assessments.

Step 9. Integration into decision-making systems.

Applying K_{int} enables: identification of safer operating conditions; selection of EW/C-RCM operating modes; route planning; adjustment of battle formations; and determination of modernization needs.

Purpose: practical application of the methodology in combat command and control.

Step 10. Verification and adaptation.

The methodology should be validated through: range trials; combat conditions; modeling systems (LVC, constructive simulation); and multi-model scenarios.

Purpose: to confirm validity and adapt the model to real-world conditions.

The proposed methodology enables the derivation of an objective integral indicator of AAE reconnaissance protection; its use for comparative assessment of different equipment samples; optimization of EW and C-RCM operating modes; formulation of tactical camouflage decisions; enhancement of unit combat survivability; and integration of results into mechanisms for ensuring the state security of Ukraine.

Conclusions

The first time, the concept of counter-reconnaissance (reconnaissance) protection of armored and automotive equipment is proposed and formalized as an integral property of combat vehicles that determines their ability to resist detection, recognition, identification, and tracking by adversary reconnaissance assets across multispectral domains (optical, infrared, radar, acoustic, vibration, and radio-technical).

An expression for the integral coefficient of reconnaissance protection of armored and automotive equipment is proposed. It comprises weighted partial indicators of acoustic, thermal, optical, infrared, radar, vibration, and radio-technical detectability and enables quantitative assessment of the overall level of equipment concealment, as well as determination of its vulnerability to adversary detection under specific combat employment conditions.

For the first time, a methodology for calculating the integral coefficient of reconnaissance protection of armored and automotive equipment of the Security and Defense Forces of Ukraine has been developed. The methodology accounts for the integral indicator of reconnaissance protection and the specific impact of operating modes of counter-radio-controlled munition (C-RCM) systems and electronic warfare assets on the probabilities of detection, engagement, and loss of combat effectiveness. This enables a quantitative linkage between the results of modeling signature characteristics and indicators of combat losses, and supports the development of scientifically grounded recommendations for equipment modernization, configuration of radio-technical system operating modes, and advancement of C-RCM complexes in the context of enhancing the level of state security of Ukraine.

Further research is planned to focus on assessing the effectiveness of counter – radio-controlled munition systems as a component of state security provision by accounting for projected unmanned activity, developing signature monitoring tools, and implementing active suppression of adversary reconnaissance channels.

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МЕТОДИКА РОЗРАХУНКУ ІНТЕГРАЛЬНОГО КОЕФІЦІЄНТА РОЗВІДУВАЛЬНОЇ ЗАХИЩЕНОСТІ АВТОБРОНЕТАНКОВОЇ ТЕХНІКИ СИЛ БЕЗПЕКИ ТА ОБОРОНИ УКРАЇНИ

Розглянуто методику розрахунку інтегрального коефіцієнта розвідувальної захищеності автомобільної та бойової бронетанкової техніки підрозділів сил безпеки та оборони України як ключового інструменту зміцнення механізмів забезпечення державної безпеки в умовах збройної

агресії та високотехнологічного характеру сучасних бойових дій. Практичний досвід протидії дистанційно керованим засобам ураження свідчить, що багатоспектральні засоби технічної розвідки противника, зокрема оптичні системи спостереження, інфрачервоні засоби виявлення, радіотехнічні комплекси, акустичні сенсорні системи, радіолокаційні засоби та сейсмічні датчики, істотно підвищують ризик виявлення та ураження військової техніки. Це ставить перед силами безпеки та оборони завдання – формування нових підходів до оцінювання її бойової живучості та прихованості. У таких умовах забезпечення необхідного рівня розвідувальної захищеності автомобільної та бойової бронетанкової техніки набуває стратегічного значення, оскільки прямо впливає на стійкість держави до зовнішніх загроз та на ефективність функціонування сектору безпеки й оборони.

Запропонована методика базується на багатокритеріальному підході, який передбачає нормування різномірних демаскувальних параметрів, визначення їхніх вагових коефіцієнтів експертним шляхом та формування інтегрального показника за принципом наближення до умовно «ідеального» зразка розвідувально-захищеної техніки. При цьому враховуються акустичні шуми, теплове й інфрачервоне випромінювання, оптична помітність, радіолокаційна відбивальна сигнатура, сейсмічні прояви, а також радіотехнічна сигнатура, що формується під час роботи штатних і спеціальних радіотехнічних засобів, включно із комплексами радіоелектронної боротьби та системами протидії радіокерованим боєприпасам. Особливу увагу приділено факторам, які, забезпечуючи захист від дистанційно керованих засобів ураження, одночасно збільшують радіотехнічну помітність техніки, що безпосередньо впливає на загальний рівень її розвідувальної захищеності.

Наведена методика дає можливість здійснювати системне порівняння різних зразків техніки і засобів протидії дистанційно керованим боєприпасам, оцінювати їхню придатність до застосування у конкретних тактичних умовах, визначати найбільш ефективні режими роботи радіоелектронних засобів та оптимізувати тактичні рішення. Розрахований інтегральний коефіцієнт може бути інтегрований у процедури планування застосування сил безпеки та оборони, моделювання бойових дій, формування рекомендацій щодо модернізації озброєння та військової техніки, а також в обґрунтування управлінських рішень у сфері державної безпеки.

Розроблена методика є важливим складником формування комплексної системи забезпечення державної безпеки України, оскільки дає змогу кількісно визначати ступінь уразливості автомобільної і бойової бронетанкової техніки до технічних засобів розвідки противника та прогнозувати ефективність засобів маскування і протидії високотехнологічним загрозам.

Ключові слова: державна безпека, механізм забезпечення, сили безпеки та оборони, автобронетанкова техніка, розвідувальна захищеність, протидія радіокерованим боєприпасам, безпілотні літальні апарати, виявлення, акустична вібрація, вплив, діагностування, захист, коефіцієнт, моніторинг, спектральний аналіз, розвідувальні ознаки, радіотехнічна помітність.

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