

Resume

MILITARY TECHNICAL POLICY

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DETERMINATION OF CRITERIA AND METHODS FOR ASSESSMENT OF THE WAYS ON ENSURING OF THE MILITARY COMMANDS WITH WEAPONS AND MILITARY EQUIPMENT

There is determined the researches direction and the basic alternative versions deal with searching of the possible ways for ensuring of the military commands with weapons and military equipment. The objective limitations deal with production capacity and other limitations deal with existing infrastructure are determined for target function connected with ensuring with weapons and military equipment. Some aspects of economical dependence from foreign samples of weapon and military equipment designed in accordance with ISO standards during life cycle are considered in paper. The basic stages and factors influencing on accept of important management solutions are determined. Algorithm of cognitive analysis, which structure includes 7 units and connections between these units, is developed. The rational methods for expert assessment of the alternative versions on ensuring with weapon and military equipment on every stage are specified there. Also, there is clarified a role of automation and artificial intellect in that process. Analysis dealing with necessity of intellectual systems for processing of the non-structured data missives in process of management of safety and defense sector during planning with ensuring of weapon and military equipment is carried out.

Keywords: weapons and military equipment, artificial intellect, solution accept, cognitive analysis, expert assessment, life cycle.

ARMORED VEHICLES

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STATE-OF-ART AND DEVELOPMENT PROSPECTS OF ALL-ROUND VIEW SYSTEMS FOR MILITARY EQUIPMENT

Two types of the all-round view systems for military equipment are considered in paper: non-scanning and scanning systems. As some exhibitions demonstrated, the non-scanning systems are using successfully in some Asian and European countries for equipping of their military equipment. These systems are designed on base of some TV-cameras installed along vehicle perimeter. The main problem for these systems deals with precise installation and orientation of the TV-cameras in unified coordinate system and multiplexing of separate images into all-round panorama.

The scanning systems are free from these lacks. These systems are designing on base of alone TV-camera and panoramic view is ensuring by TV-camera rotation around vertical axis (systems without compensation of image rotation) or by angular rotation of reflecting optical element installed on exit of TV-camera (systems with compensation of image rotation).

A problem with information transfer of from movable optical sensor to stationary platform is a main lack of the systems without compensation of image rotation.

The systems with compensation of image rotation may be designed on base of three possible variants:

- 1. Systems with soft-ware compensation of image rotation. These systems demand a number cruncher.*

2. *Systems with optician-mechanical compensation. These systems use an optical compensator (Abbe or Pekhan prism, or three-mirror system) installed between objective and optical sensor. Their lack – a small view field of TV-camera, which leads to long time for panorama formation.*
3. *Systems with mechanical compensation. These systems are designed of base of Maltese cross for reflecting optical element and specific orientation of optical sensor. System is characterizing by small dimensions and high processing speed.*

On authors' opinion, the systems with compensation of image rotation on base of mechanical compensator should be used for perspective all-round systems for military equipment.

Keywords: military techniques, all-round viewing, scanning, TV-camera.

ARTILLERY WEAPONS & SMALL ARMS

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THE BASIC REQUIREMENTS FOR MODERN COMPLEXES OF GUIDED ARTILLERY ARMAMENT AS AN ELEMENT OF CONDUCTING DISTRIBUTION-FIRE ACTIONS OF TACTICAL LEVEL

The article presents general tendencies of integration of elements of artillery armament, unmanned aerial vehicles, automated control system of real-time operation in intelligence-fire complexes (IFCs)/

RECONNAISSANCE-STRIKE SYSTEMS

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IMPROVEMENT OF MODEL OF DECISION-MAKING ON IMPLEMENTATION TASKS OF FIRE DEFEAT OF OPPONENT

The results of multifactorial analysis of recent armed conflicts indicate a tendency to reduce the time of the detection-defeat cycle. One of the key stages of the detection-defeat cycle is the decision-making phase. The main disadvantages when making decisions for the tasks of the enemy's fire damage include the impossibility of taking into account the dynamics of obtaining intelligence information and, accordingly, distributing the load of means of fire influence in the process of fire damage of the enemy. The most important, in the opinion of the author, is the problem problem is the impossibility of determining the probability of realizing information about the object of the defeat during the fire damage of the enemy.

In the theoretical plan, in matters related to the decision-making on the tasks of fire damage of the enemy, there was an urgent need for improved decision-making models, due to specification of the parameters of the mass service system.

For any system of mass maintenance, the main factor determining the processes occurring in it, is the flow of applications entering the system of mass maintenance. For the conditions of the model of decision-making

to perform tasks from the fire damage of the enemy, the flow of applications in general is the intelligence information.

Usually, objects for defeat have a certain time of relevance. That is, after a certain time the object can change the position, which, accordingly, will lead to its failure in the performance of the task. Thus, the parameter of the model of the system of mass service is offered to choose a limited waiting time for the application to be queued. It is also necessary to take into account the fact that the administrative bodies, depending on the organizational structure, will in some way be merged into a hierarchical system, the main types of association are considered to be centralized and network-centric. The main difference between these associations, according to the author, is the ability of the flow of information to change its direction, depending on the conditions. Therefore, it is proposed in the model to provide a recognition unit (definition) of the type of association in the hierarchical structure of the governing bodies.

Thus, in the case of network-centric association, the system of mass service can be represented as a complex of one-channel mass maintenance systems merged into a single structure with a uniform distribution of the flow of applications, depending on the level of the hierarchy and the time of functioning.

In the case of a centralized merger, the mass service system may be presented as a set of directions in which the flow of applications is distributed according to the capabilities of each stream.

Taking into account the accepted assumptions about the uniformity of the authorities, it can be argued that in the case of a centralized association it is possible to apply medium-term approaches. The essence of the approach is to study one object from the whole population provided they are homogeneous and, accordingly, according to research findings, draw conclusions about the mean values of the parameters of the remaining objects.

Thus, the article considers an improved model of decision-making for the tasks of enemy fire damage using the approaches of the theory of mass service and by refining the parameters of the mass service system, in particular taking into account the limited waiting time of the application in the queue, which will allow for taking into account the dynamics of obtaining intelligence information, type organizational association of government bodies, and will allow to provide appropriate recommendations for raising the level of probability of information implementation. They are about the object of the defeat during the fire damage of the enemy.

Keywords: mass service theory, model of decision-making on implementation tasks, fire defeat of opponent.

AIR DEFENSE SYSTEMS

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METHOD FOR PREDICTION THE STATE OF THE SURFACE-TO-AIR MISSILE PARK AT THE STAGE OF FORMATION OF THE REQUIREMENTS SPECIFICATION FOR CONDUCTING WORKS ON ASSIGNED MEASURES EXTENSION

Presented in the paper is a method for prediction the state of the surface-to-air missile (SAM) park at the stage of formation of the requirements specification for conducting works on assigned measure extension. Method is based on the model of varying the dimension of combat-ready SAM park as a function of SAM assigned service life value and other parameters, which have an essentially influence on the dimension of considered SAM park. This model allows calculating number of combat-ready SAMs of the park taking into account year and month of manufacturing. Sample results (in the form of a diagram) of modeling the function of combat-ready SAMs` number versus calendar time in service, for various values of SAM assigned service life, and other functions are presented in the paper. Developed model allows on-the-fly assessing the influence of assigned measures` values and other factors on the dimension of the combat-ready SAM park from calendar service life. It was proposed to determine requirements for new values of SAM assigned measures based on the results of modeling mentioned functions. Developed method allows correcting a prediction of the state changing dynamics for park of various type SAMs, and also substantiating requirements for values of assigned

service life measures, which stated at the stage of formation of the requirements specification for works on service life extension.

Keywords: after-service life, assigned service life measures, method for predicting the state of SAM park, model of varying the number of combat-ready SAMs, service life-limit.

MILITARY AIRCRAFTS

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TRAINER AIRCRAFTS WITH TURBO-PROPELLER ENGINES

The prerequisites for the emergence and further development of training aircrafts, equipped with turbo-propeller engines and their place in the flight training system of military pilots are considered. A comparative analysis of the basic performance data of almost all training aircrafts of this type, which were produced serially for more than 40 years, was carried out. The criteria for dividing these aircraft into light and heavy training aircrafts are given and the areas of their possible application are analysed. Typical representatives of modern turboprop training aircrafts are light German G-120TR and heavy American T-6A Texan II or Swiss RS-21. A comprehensive technical and economic assessment of modern turboprop training aircrafts is presented with the use of price and generalized specific indicators. Prospects and recommendations regarding the development of aircraft of this class in Ukraine are considered.

Keywords: trainer aircraft, performance data, turbo-propeller engines.

AIRCRAFT ARMAMENT & FACILITIES

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METHODOLOGICAL RECOMMENDATIONS ON THE DIVISION OF COMPONENT PARTS OF THE GUIDED AVIATION MEANS OF DESTRUCTION INTO GROUPS ACCORDING TO SAFETY LEVELS AND INSPECTABILITY

The article presents methodical recommendations on the division of assemblies and systems of the guided aviation means of destruction into groups taking into consideration their inspectability and influence on safety of application.

Due to above mentioned, it is considered to present guided aviation means of destruction as multilevel construction of interactive elements, which are incorporated in the subsystems of different levels. Application of decomposition procedure will allow presenting them as a structure, which includes several levels, and conducting distribution of the system, aggregates, blocks, etc. (further – component parts) into groups, taking into account certain characteristics. Mathematical basis for the formal solving of problem is the aggregation and decomposition approach, which presents the structure of composite system as an aggregate of associated elements of different levels.

Keywords: aggregative and decomposed approach, decomposition, guided aviation means of destruction, inspectability, emergency situation, complex system, component part

 TARGET ACQUISITION & SIGHTING SYSTEMS

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BORESIGHTING OF THE OPTICAL DEVICES FOR BATTLE MULTIPLE ROBOTS

A big base distance L between sights exit pupil and weapon (in diapason 100...400 mm) is a structural peculiarity of battle multiple robots. Boresighting of these devices, i.e. determination and elimination of angle deviation of sights viewing line and weapon barrel bore axis, is arising when the tests and operation of these devices.

Paper presents the analysis of the well-known principles of boresighting devices design and the proposals on development of the universal device for boresighting of the optical-electronic sights operating in different spectral diapasons for different types of the battle multiple robots with different base distance between sights and weapon.

Today such control-measuring devices are using for that purpose: «laser bullet», laser device for boresighting, boresighting tube and barrel collimator.

A structural peculiarity for «laser bullet», laser device for boresighting and boresighting tube is position of its exit pupil. Exit pupil is oriented to targets space. It provides obligatory application of special screen, measuring or ranging pellet but it is not possible in military actions conditions usually. At the second, these all devices are operating in visible spectral diapason, i.e. boresighting of the infrared sights.

The devices where an exit pupil is oriented to sight (barrel collimators) have significant advantage from that viewpoint.

On authors' opinion, a barrel collimator should be design on base of mirror collimator fixed on rod- caliber and mirror unit comprising two penta-mirrors. The first penta-mirror is installing on collimator optical axis and it reflects an optical axis under angle 90° to the second penta-mirror. The second penta-mirror is installing on reflected optical axis with possibility to change a base distance L and to reflect an optical axis under angle 90° to sight.

Such structure barrel collimator permits to carry out boresighting for battle multiple robots with different base distance L and application of mirror optics permits to boresight the optical devices working in visible and infrared spectral diapason.

Keywords: boresighting, «laser bullet», laser device for boresighting, boresighting tube, barrel collimator.

INTELLECTUAL PROPERTY

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IMPLEMENTATION OF INTERNATIONAL NORMS IN THE FIELD OF INTELLECTUAL PROPERTY IN NATIONAL PRACTICE IN THE CONTEXT OF INCREASING THE EFFICIENCY OF THE INSTITUTIONAL ENVIRONMENT

The scientific article provides with the system of legal intellectual property rights protection and enforcement on international level. The international institutional context of protection and enforcement of intellectual property rights is characterized. The institutional support of state regulation in the field of intellectual property on the national level is described. The preconditions of high level infringements in the field of intellectual property rights are considered. The features of international agreements and conventions

in the functioning process of intellectual property rights in the global context are analyzed, and the role and participation of Ukraine in this process are investigated. Based on the formed provisions, the conclusions about the current state of intellectual property institutional environment in Ukraine are formed. The necessity of harmonization of Ukrainian legislation on intellectual property with international norms and standards are substantiated. Suggestions about improvement the process of international standards in intellectual property implementation into national practice are proposed.

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PROTECTION OF OBJECTS OF INTELLECTUAL PROPERTY RIGHTS BELONGING TO THE SPHERE OF NATIONAL SECURITY IN THE ADVANCED COUNTRIES OF THE WORLD

The article deals with further intensification of the process of implementing the norms of international law in the relation of intellectual property regulation and in particular, the introduction of a global patent. At the same time, the progressive process of adaptation of national legislation to international norms doesn't affect matters concerning the interests of national security and the defense of individual states. This aspect is reflected in international treaties, conventions and treaties, which are aimed at globalization of the processes of protection of intellectual property in the world.

The peculiarities of international agreements and conventions in the field of intellectual property functioning in the global context are analyzed. Based on the above-mentioned provisions, it is concluded that the current legislation of foreign countries is aimed at the application of the patent system to promote the efficient use of inventions, innovation processes while ensuring the interests of the state in the field of national defense and security.

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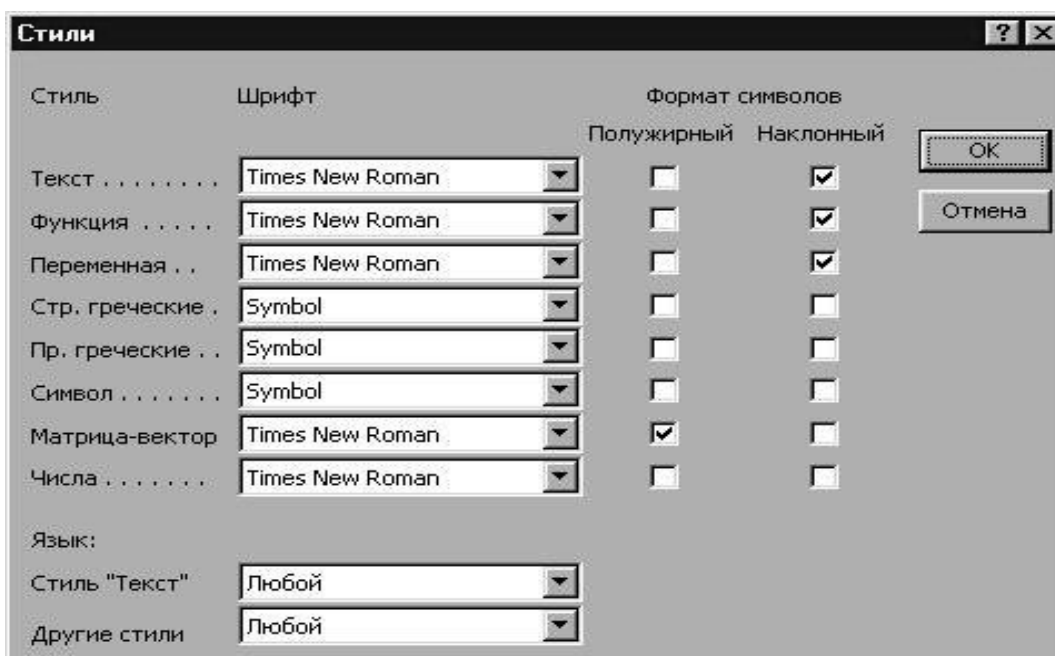
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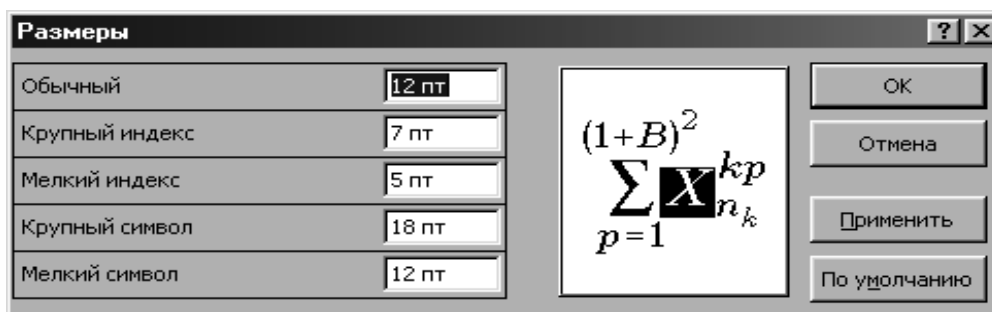
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