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## USING THE DATA OF THE AUTOMATED BALLISTIC INFORMATION SYSTEM «BALSCAN» TO ESTABLISH THE CIRCUMSTANCES OF CRIMINAL OFFENSES

**Анотація.** У науковій статті досліджено функціонування балістичного обліку взагалі та зокрема автоматизованої балістичної інформаційної системи «balscan» під час розкриття та розслідування кримінальних правопорушень. Підґрунтям роботи стали наукові погляди видатних вчених-криміналістів, нормативно-правові акти, судово-слідча та-експертна практика.

Висвітлено завдання балістичного обліку, зокрема, встановлення фактів використання одних і тих же екземплярів зброї у разі вчинення кількох кримінальних правопорушень; виявлення зброї, яка застосовувалась у вчиненні правопорушень, серед вилученої, знайденої та добровільно зданої; при використанні правопорушниками втраченої нарізної або гладкоствольної вогнепальної зброї, що була на озброєнні органів поліції; встановлення зброї, зареєстрованої на об'єктах дозвільної системи тощо. Зазначено особливості формування кулегільзотеки, по-перше, це об'єкти, що мають безпосереднє відношення до події правопорушення, тобто вилучені під час проведення слідчих (розшукових) дій, по-друге, джерелами обліків є об'єкти, що використовуються для порівняльного дослідження.

Доведено ефективність введення в експлуатацію комплексної системи балістичної ідентифікації «BalScan» Експертною службою МВС України та особливості її використання в умовах сьогодення. Акцентовано на перевагах її використання поряд її сталою обліковою базою. Наведені тези підтверджено результатами вивчення експертних висновки, матеріалів кримінальних проваджень та інтерв'юванням практичних співробітників.

**Ключові слова:** балістичний облік, автоматизована балістична інформаційна система «balscan», кримінальні правопорушення, вогнепальна зброя, кулі, гільзи.

**Formulation of the problem.** During the disclosure and investigation of criminal offenses, the pre-trial investigation authorities use a variety of evidence acquired legally, among which accounting is important in a new automated format. The need for immediate inspection of seized objects arises during the investigation of banditry, killings, etc. Today, not only the use of registration data, but also almost instant results throughout Ukraine are considered effective, which allows you to make only an automated database.

Using ballistic accounting, it is possible to identify the weapon from which the cartridge case, bullet was fired, as well as to combine several offenses behind the cartridge cases (bullets). In confirmation of this, we will give an example from practice that demonstrates the assistance of information obtained by ballistic account, further investigation and identification of the person of the offender. Thus, in

Pyatykhatsky district of Dnipropetrovsk region, an inspection was conducted on the fact of the fire.

Increasing the effectiveness of detection, disclosure, investigation and prevention of criminal offenses related to the use of weapons is to one extent or another due to the use of certain information support. The legislative basis for this is the Order of the Ministry of Internal Affairs of Ukraine dated September 10, 2009 № 390 «On approval of the Instruction on the functioning of forensic records of the expert service of the Ministry of Internal Affairs of Ukraine», according to which among the types of forensic accounting a separate place is ballistic.

**Analysis of research and publications in which the solution of this problem is initiated.** The problems of forensic support of investigation of crimes related to the illegal circulation of weapons and ammunition were the subject of consideration of domestic and foreign forensic scientists: V.V. Areshonkova, R.S. Belkin, O.O. Belyakov, P.D. Bilenchuk, V.V. Voynova,

I. F. Gerasimova, V. E. Berger, L. Ya. Drapkina, A.V. Ishchenko, E.P. Ishchenko, B.M. Komaryntsa, A.V. Kofanova, G.M. Meretukova, O.S. Podshybyakina, V.M. Pleskachevsky, V.A. Ruchkina, E.N. Ustinova, A.G. Filippova, N.P. Yablokova and others.

**The purpose** of this work is to study the features of the automated ballistic information system «BALSCAN» and use its data to establish the circumstances of criminal offenses.

**Presentation of the main material.** Information support for the investigation of crimes is a multifaceted activity, which is based on the activity in the formation and conduct of forensic records, as well as the practical use of the information contained in them. In the process of information security forensically significant information is collected, processed, stored and used. Analysis of the regularities of such information processes and development of software and technical means on the basis of new information technologies allow us to talk about the possibilities of increasing the level of information support of crime investigation.

Considering the information and reference support of the investigation as a separate criminalistic doctrine, V.V. Biryukov includes a forensic registration, under which he understands «the set of knowledge about the organization and functioning of forensic accounting, as well as the use of information contained in the process of disclosure and investigation of crimes». At the same time, under forensic accounting, the author understands «a set of information and search engines created and operating in law enforcement agencies in order to provide the process of investigating crimes with certain information about objects of increased criminogenic risk, which constitutes their arrays.» [4, p. 315].

Determination of the place of forensic ballistic accounting in the accounting system of the Ministry of Internal Affairs of Ukraine has repeatedly been the subject of scientific debate. However, we support the opinion of some scientists that the difference between administrative, operational and forensic ballistic accounting is quite conditional and depends primarily on the field of law enforcement they are used in [1, p. 143]. Forensic records are used exclusively in the investigation of criminal offenses.

Specifying the tasks of ballistic accounting, note that kulegilsoteks are created for: establishing the facts of the use of the same copies of weapons in case of several criminal offenses; detection of weapons used in committing offenses, among seized, found and voluntarily surrendered; when used by offenders of lost rifled or smooth-bore firearms that were in service with the police; installation of weapons registered at the objects of the permitting system and which is in the personal use of citizens; detection of weapons lost by police officers, among seized, found and voluntarily surrendered.

On the one hand, the kulegilsotek is filled with objects that are directly related to the event of the offense - seized during investigative (search) actions - an inspection of the scene, a search, an investigative experiment. On the other hand, accounting sources are objects used for comparative research: 1) operational search collections (bullets, sleeves and cartridges with traces of weapons; bullets and

casings, experimentally fired from seized, found and voluntarily surrendered weapons; bullets and casings, experimentally shot from table weapons armed with law enforcement agencies, authorized state authorities; bullets and casings, experimentally fired from weapons registered at the objects of the permitting system; bullets and casings, experimentally fired from weapons that are owned by citizens; information about samples of homemade weapons; Sleeves of lost smooth-bore firearms; information about crimes committed with the use of firearms and the facts of its removal from illegal circulation); 2) information and reference collections (weapons formed from natural samples, parts, mechanisms, blanks, tools and information about them; ammunition (formed from natural samples of ammunition or their parts, information about them); bullets and sleeves with traces of weapons (formed from bullets and sleeves experimentally shot from firearms) [6].

Using ballistic accounting, it is possible to install both a weapon from which there was a gun case, a bullet, and a combination of several offenses behind sleeves (bullets). In confirmation of this, we will give an example from practice that demonstrates the assistance of information obtained by ballistic account, further investigation and identification of the person of the offender. Thus, in Pyatykhatsky district of Dnipropetrovsk region, a private house was inspected on the fact of the fire, during which the body of a woman with a bullet wound and a 9mm PM case was found. A month later, in another criminal proceeding during the search of the apartment of two fraudsters, in addition to the main objects of the search, two sleeves were seized. After the ballistic inspection, it was found that all the tubes on the specified criminal proceedings were fired from the same weapon.

Analyzing expert practice, it should be noted that mostly ballistic checks receive bullets, about 20%, the rest are casings, more often shot from recycled pistols for traumatic ammunition, due to their simple access (signal in free access, traumatic with registration.)

In the context of the development of computer technologies, technological progress, undoubtedly, preference is given to automated information and search engines, one of which is the automated ballistic information system «BalScan» of the Czech manufacturer «Laboratory Imaging,» which since 2019 has been operating in the Expert Service of the Ministry of Internal Affairs of Ukraine at the central and regional levels. The system is universal for detecting firearms on ammunition and its parts. Cartridges, sleeves and bullets detected at the scene are scanned using modern optics, while creating a three-dimensional digital copy, which is further stored in the database. The program automatically evaluates possible matches with other images already entered in the database. The program has a special mode for comparing the found balls or tubes by a forensic expert. The system is designed to digitize a wide range of ammunition from small arms to homemade weapons. The side surface of a case or bullet, the bottom of the sleeve is scanned completely at high resolution with a 360-degree girth of the surface and includes spatial information in the 2D or 3D image [5].

The effectiveness of using automated ballistic accounting was confirmed by the results of interviewing not only employees of expert institutions, but also investigative and operational units. However, the functioning of any automated accounting, taking into account the relative novelty, has separate features and takes some time to put into operation. Computer technologies can not completely replace specialists, but only provide the opportunity to use their special knowledge more efficiently.

To improve the work of the integrated ballistic identification system «BalScan» scientists propose: the introduction by the world community of the distribution of automated ballistic identification systems with a single registry of information encoding, which would make it possible to receive operational information during checks of seized objects on the created and accumulated data from many countries of the world in real time; implementation of ballistic standard on sleeves; marking weapons with tags of any nature (forensic or alphabetical/symbolic), which must be carried out by each manufacturer of weapons, which must be controlled by the state [1, p. 75]. Enjoying this, we consider it necessary to pay attention to the main problem - a large amount of information that needs to be translated into digital format in as short a time as possible, given that specialists need not only to translate into digital format an existing kulegilsotek, which has hundreds of thousands of objects, but also to constantly add new ones.

For example, for registration of one unit of weapons, it is necessary to process at least three sleeves and three bullets (for a gun), which the specialist spends about 10 minutes. In order to register a revolver, it is necessary to process from five to seven shells. It takes even longer to perform formal procedures (filling in journals, assigning identification numbers, etc.). We believe that increasing the number of jobs equipped with the appropriate ballistic complexes can significantly accelerate the process of filling automated accounting.

**Conclusion.** To sum up, note that the rapid commissioning of the complex ballistic identification system «BalScan» by the Expert Service of the Ministry of Internal Affairs of Ukraine at all levels, indicates its effectiveness. Taking into account the relative novelty of the system in the post-Soviet space, nowadays it is necessary to note certain limitations in its use in full, which is due to the following factors. Firstly, the need for registration and digitization of the kulegilsotek, which is stored in natural collections, was held the day before, which in our opinion can be solved by introducing additional jobs equipped with a modern integrated ballistic identification system «BalScan.» Secondly, certain obstacles arise during interaction between services (bodies), which provide ballistic objects for inspection by base, which can be avoided by legislative consolidation in the relevant orders, orders and training sessions for advanced training.

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**Summary.** The scientific article investigates the functioning of ballistic accounting in general and in particular the automated ballistic information system «balscan» during the disclosure and investigation of criminal offenses. The basis of the work were scientific views of prominent forensic scientists, normative legal acts and investigative and expert practice. The effectiveness of the ballistic identification system «BalScan» commissioning by the Expert Service of the Ministry of Internal Affairs of Ukraine and the peculiarities of its use in today's conditions have been proved. It focuses on the advantages of its use along with the constant accounting base. These theses are confirmed by the results of the study of expert opinions, materials of criminal proceedings and interviews with practical employees.

**Keywords:** ballistic accounting, automated ballistic information system «balscan», criminal offenses, firearms, bullets, sleeves.