

# Conceptual Framework Of The Construction Of Comprehensive Information System Of Shooting Data Preparation And Ballistic Object Trajectory Research

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**Abstract** – A conceptual framework of a comprehensive information system of shooting data preparation and video monitoring system to confirm the ballistic trajectory of the object (BT) in the close to real time mode has been suggested.

**Keywords** – ballistic station, digital camera, trajectory, ballistic object.

## I. INTRODUCTION

The effectiveness of artillery system application depends entirely on the quality of data preparation for shooting, therefore great consideration to the solution of this problem has been given in the armed forces not only of our country but also in other leading countries.

Today, the primary method of data preparation for shooting in the armed forces of Ukraine has been based on the use of tabulated coefficients [1], but it delivers significant errors, since the choice of coefficients is based on averaged meteorological data obtained from weather station measurements.

Therefore, to determine the influence of meteorological conditions the application of a complex microprocessor automated system for meteorological data measuring and ballistic data calculation has been proposed.

## II. DISCUSSION

The use of modern computer technology makes it possible to optimize and accelerate the ballistic calculations that are conducted for fire control. Optimization of the correction factors determination and the operational definition of ballistic factors which influence the distance of BT flight will enhance the effectiveness of artillery systems shooting.

The meteorological conditions, initial goniometer settings, sight and aimpoint, advancing on moving target shooting affect the BT flight and target hit accuracy.

It is almost impossible to take into account all the factors influencing the precise and correct theoretical

trajectory calculation, therefore it is necessary to conduct experimental studies of the actual flight trajectory of BT, in order to determine deviations and other differences between the theoretical model and practical results.

The operation of comprehensive information system of shooting preparation shall be divided into three main stages:

1. Determination with the required accuracy of all meteorological and ballistic conditions and factors and subsequent analytical calculation of the theoretical BT trajectory;
2. Experimental determination of the real BT trajectory using photo fixing of its individual sections by digital means;
3. Comparison of the theoretical BT trajectory with the experimental one. Determining deviations, and making appropriate corrections in the shooting data.

Development of a generalized calculation algorithm based on the research experience set forth in [2] makes it possible to minimize the calculation errors. One of the methods of the real flight trajectory constructing is a photometric method [3]. The development of digital imaging technology facilitates its use in various areas.

## III. CONCLUSION

Based on the analysis of methods and ways of correction factors obtaining, as well as methods of flight trajectory construction the integral comprehensive system that allows to conduct high accuracy measurements of meteorological and ballistic conditions and determination of real trajectory basic parameters has been suggested.

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