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MEASURING-COMPUTING COMPLEX OF MILITARY TEST RANGE AND GENERAL REQUIREMENTS FOR ITS COMPONENTS

Barkhudaryan M. V.
Candidate of Technical Sciences, Senior Researcher,
Associate Professor at the Department of Physics and Radio Electronics
Ivan Kozhedub Kharkiv National Air Force University

Chumak B. O.
Candidate of Technical Sciences, Associate Professor,
Senior Researcher at the Research Center
Ivan Kozhedub Kharkiv National Air Force University

Kovalchuk A. O.
Candidate of Technical Sciences, Senior Researcher,
Associate Professor at the Department of Physics and Radio Electronics
Ivan Kozhedub Kharkiv National Air Force University
Kharkiv, Ukraine

The measuring-computing complex as an element of test range is created to assess a flight performance of missile (anti-aircraft missile) weapons and military equipment, which includes the following stages:

– carrying out onboard measurements;

– transmission of measurement results to ground-based measuring instruments;

– reception and processing of measurement results;

– analysis of measurement results;

– issue of recommendations, conclusions and proposals.

However, the outlines of promising test range measuring-computing complex (TRMC) capable of providing the required amount information of a given quality have not yet been finally determined. Forming the structure of a promising TRMC, always strive for a certain compromise between the possibilities of its practical creation and the needs of the customer.

At the same time, it is not possible to create an TRMC that would meet all requirements in terms of testing new types weapons and military equipment and / or conducting military exercises with live fire.

Thus, the creation of a rational (reasonably substantiated) structure TRMC is an iterative process and depends on amount of possible financial costs for its creation. It is quite clear that at the same time want the TRMC to be an effective system with the possibility of its further modernization [1, p. 58].

An effective system from the point of view a certain quality of functioning is that system that meets the following requirements:

– in the given operating conditions, completely and within the given timeframe, fulfills the tasks facing it (technical efficiency);

– the positive effect of using the system for its intended purpose – not less that the cost of its creation and maintenance during operation.

In this case, the choice of an efficiency criterion is external task that must be solved on the basis of analysis the goal of a system of a higher order than the system that is being considered, and in which this system is included as a component.

Since we are talking about TRMC, the experimental-technical base (ETB) of test range will be a higher-order system for it. ETB – a set of experimental combat systems, elements of positional areas, technical testing and measuring equipment, as well as combat and material-support equipment.

So, TRMC is a set of interconnected technical means with information and technical support, buildings of measuring points, computing centers, radio engineering, quantum-optical and optoelectronic stations designed to receive and process information about the functioning of all types test objects, control their motion on the area of launch and flight, as well as control of motion warheads along the entire trajectory of their flight.

The purpose of TRMC is always associated with the solution of the tasks of ensuring information interaction with test objects in order to form, retrieve, transmit, receive, transform and process information that is transferred using electromagnetic and other fields through the medium that separates objects and spatially separated elements of the TRMC [2, p. 113].

TRMC is assigned the following tasks:

– provision of prelaunch preparation of products;

– organization and conduct of telemetry measurements during product launches;

– organization and performance of high-precision trajectory measurements in all flight phases;

– collection of measurement information;

– processing of measurement results in real time, express processing, complete mathematical processing in due time and delivery of information to consumer;

– carrying out research and development work in order to improve and increase the efficiency of TRMC.

At the same time, in course of military exercises and during flight tests, control-serial and training-combat launches of products and other objects, TRMC must solve the following tasks:

– carrying out trajectory and telemetric measurements at the specified flight sections of the product;

– carrying out trajectory and telemetric measurements at the given flight sections of warhead (warheads), with the exception of measurements for special control;

– measurements of the signal characteristics (radiation and reflection) of products;

– fixing the fact of burning and destruction of parts of the product, as well as the fact that the product meets with the target;

– collection, transmission, processing and presentation of measuring information obtained during flight tests, serial control and combat training launches of products;

– predicting the coordinates of impact points and determining the total flight time of warheads, including those not equipped with measuring instruments;

– carrying out telemetry measurements, checking the onboard measuring equipment and prelaunch measurement equipment at the launch position.

Thus, in accordance with the purpose and tasks to be solved, the composition of the TRMC should include:

– trajectory measuring instruments;

– telemetric measuring instruments;

– means for measuring signal characteristics;

– an automated system for collecting, transmitting, processing and presenting measurement information;

– automated communication system;

– means of command and program trajectory radio lines;

– means of control system of TRMC;

– means of the system of uniform time;

– means for determining the coordinates of the points of incidence of the warheads and the total flight time;

– means of countering foreign technical intelligence, as well as active and passive camouflage of radio electronic means;

– means of geodetic support.

However, taking into account the requirements arising from the tasks of a prospective TRMC, it is advisable to add the following components to the above list:

– equipment for metrological support;

– technical condition monitoring equipment;

– meteorological support facilities;

– mobile means of seismic acoustic systems;

– mobile measuring instruments;

– control-corrective equipment;

– means of remote measurements and television surveillance.

In addition, in a prospective TRMC, a necessary component is the ability to use the signals of navigation space systems for coordinate-time support, which is an additional factor in increasing the efficiency indicators (primarily, accuracy) of TRMC [3, p. 21]. This interaction makes it possible to provide navigation measurements and objects using non-equipped flight paths.

After defining the subsystems and means that should be part of the TRMC, are proceed to defining the requirements for their qualitative and quantitative characteristics.

At the same time, the requirements for technical characteristics of individual systems and means follow both from the general tasks of TRMC, and from the technical characteristics of objects nomenclature, the tests of which the TRMC should provide [4, p. 10].

Thus, this paper shows the methodology for constructing the structure of a promising test range measuring-computing complex, and also formulates the basic requirements for it and its components.

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USING A MOBILE CARDIOGRAPH CONNECTED TO CLOUD TECHNOLOGIES FOR HUMAN CONDITION MONITORING

Fomovskyi V. F.
Postgraduate Student (PHD) at the Department of Automation and Information Systems
Kremenchuk Mykhailo Ostrohradskyi National University

Artemenko V. O.
Master at the Department of Electronic Devices
Kremenchuk Mykhailo Ostrohradskyi National University

Pylypenko S. S.
Postgraduate Student (PHD) at the Department of Electronic Devices
Kremenchuk Mykhailo Ostrohradskyi National University
Kremenchuk, Poltava region, Ukraine

Identifying the underlying causes of palpitations and other arrhythmia-related symptoms is of great clinical importance. Registration of heart rhythm directly during the onset of symptoms by long-term ECG monitoring is a known method for identifying their cause in patients [1, 2]. ECG monitoring is an important diagnostic method for correlating symptoms and heart rate. The development of modern technologies has provided a wide range of devices for ECG monitoring, which differ in the duration of monitoring, signal recording quality, convenience and invasiveness.

In addition, it should be borne in mind that Holter monitoring (HM) is widely used in various clinical settings to diagnose arrhythmias and conduction, which can't always be detected by a standard electrocardiogram (ECG). CM allows to establish the relationship of clinical symptoms with cardiac arrhythmias and conduction, to assess the effectiveness of anti-