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Borisenko M., Utyuzhok S.**PROPOSALS FOR THE DEVELOPMENT OF CONTROL MEANS
OF THE TECHNICAL CONDITION OF UNMANNED AIRCRAFT**

The results of joint military operations in eastern Ukraine and other armed conflicts confirm the increasing influence of unmanned aerial vehicles, including unmanned aerial vehicles (UAVs), cruise missiles, etc., in achieving tactical, operational, tactical and even strategic levels. [1]. But the suboptimal system of control and diagnosis of the technical condition of the UAV was the cause of numerous "non-combat" losses of the devices, due to the late detection of failures [2].

When monitoring the technical condition of UAVs, as a rule, investigate the dynamic characteristics of the units and components of the devices. A significant role is given to monitoring the technical condition of electronic equipment [3]. To carry out operations to monitor the technical condition of the UAV electronic equipment, control means with the required characteristics are required: test signal generators and electronic equipment response analyzers for the impact of test signals. As a result of the test signal at the output of the UAV electronic equipment, a response signal (output signal) is formed [4]. This output signal depends on the shape of the input signal and the parameters of the electronic equipment. Based on the results of comparing the input and output signals of the electronic equipment, the analyzer of the measuring signal gives data on the values of control parameters [5]. Comparing the values of the control parameters of the electronic equipment with the required tolerances allows not only to determine the technical condition of the UAV, but also to diagnose it.

It is shown that at the required control time (required number of reference points) of UAV electronic equipment parameters, characteristics of control means, presence of obstacles during control, substantiation of optimal for this quantitative assessment control technique is to calculate such parameters of input measurement signal (measurement signal synthesis process). which provide the maximum or minimum value of this estimate.

It is proposed to use quantitative assessments of the quality of control for such an assessment. Such estimates include: the amount of measurement information, sensitivity, accuracy. Therefore, when optimizing the parameters of the input test signal for sensitivity, it is necessary to ensure the maximum value of sensitivity; when optimizing the parameters of the input test signal for the accuracy of the signal is aimed at ensuring the minimum value of the measurement error of the parameters of the electronic equipment control.

It is substantiated that for calculation of optimum values of parameters of a test signal it is necessary to define maxima (minima) of quantitative estimations of functions of quality of control.

Thus, the synthesis of optimal parameters of the input test signal for monitoring and diagnosing the technical condition of the UAV electronic equipment is to solve the variational problem of calculating the maximum (minimum) value of the functional that characterizes the class of test signals. Mathematical models of possible limitations in the synthesis of optimal parameters of input test signals are substantiated.

References

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