ABSTRACT MULTI-CHANNEL OPTO-ELECTRONIC SURVEILLANCE SYSTEMS

Workload - 99 pages;

Number of illustrations - 21;

Number of tables - 33;

Number of sources per link - 34.

Topicality. Multi-channel optoelectronic systems have a wide range of applications. Starting from the military sphere and exploration ending with the agrarian sphere and robotics. Multichannel optical-electronic systems can be used for the following tasks:

- Get panoramic images of the terrain, for military and intelligence.
- • Creation of field and plantation maps for farmers.
- Expanding field of view to 180 ° or more in robotics.

Existing multi-channel systems are targeted at military applications, and generally have large dimensions and considerable cost, which in turn necessitates the use of special facilities to operate such systems. These shortcomings also narrow the range of individuals and businesses that can use the data system. Given these factors, it can be said that the improvement and development of new types of multi-channel optoelectronic systems is relevant.

Object of study. The process of forming a digital image in a multi-channel optoelectronic surveillance system.

Subject of study. Intelligent camera for unmanned aerial vehicle.

Goal. Develop a model of intelligent, small-size multi-channel surveillance system for use with unmanned aerial vehicles.

To achieve this goal, the following tasks are solved:

• • An overview of existing multi-channel surveillance systems and intelligent systems for unmanned aerial vehicles has been made.

• • Complete set selection for multichannel system layout.

• • Image formation in a multi-channel optical-electronic system is investigated.

• • Engineering calculations performed.

• • A startup project for a company producing multichannel systems has been developed.

Publications:

1. Special instrument: state and prospects, collection of scientific papers of the third Ukrainian scientific and technical conference. The state-owned enterprise of the special instrument maker "Arsenal". Review of distortion calibration.

2. 20th International Conference of Young Scientists on Optics and High-Tech Materials - SPO 2019. Image stitching in unnamed air vehicle.

3. XII nationwide scientific-practical conference of students, graduate students and young scientists "Look into the future of instrument making", a collection of papers of conferences. Using correlation filters to support the UAV.

4. VII International Conference of Optoelectronic Information Technologies Photonics-ODS 2018, conference abstract. A review on image stitching.

5. XIV nationwide scientific and practical conference of students, graduate students and young scientists "Efficiency of engineering decisions in instrument making", proceedings of the conference. Efficiency of calibration of distortion in UAV vision systems.

Keywords: Image stitching, panoramas, UAVs, intelligent systems.