

# Expansion of functionality and increase use information pyrovidicons termovision systems

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**Abstract** - Two-channel principle of infrared camera design that allows not only, on difference of existing devices,, to obtain stereo image of an object, but also to organize the procedure of frame-by-frame processing of both channel pyrosignals is proposed. The result of such processing consists in vital decrease of pyrovidicon targets geometric and pedestal noise influence, and useful signal increase and. consists in synchronous and asynchronous interferences.

**Keywords** – Termovision systems, infrared cameras, pyrovidicon, piroosygnal.

## I. INTRODUCTION

Developed by authors two-channel infrared camera allows not only to solve the problem how to obtain dynamic stereo images of thermal objects, but also to enhance greatly the measure of the device noise immunity.

## II. TERMOVISION SYSTEMS

The solution is based on difference processing of pyrosignals in two-channel camera. Difference frame-by-frame processing of pyrosignals is one of main procedures that decrease a component of noise in final signal. The block-chart of proposed by authors [1] two-channel infrared camera is showed in Fig.1.

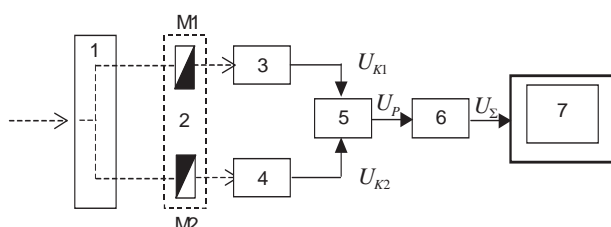


Fig.1. Block-chart of two-channel IR camera: 1- optical-dividing unit; 2 – unit of synchrony modulators; 3, 4 – the first and the second one channels of IR camera; 5 – unit of difference processing of pyrosygnals; 6 – processor of adjacent frames summation; 7 – monitor.

IR radiation of the object is perceived by optical-dividing unit 1 that performs functions of two identical thermal flows forming and thermal image focusing in the targets of the first and the second channels pyrovidicons.

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Synchronous and anti phase modulation of these flows is performed by unit 2. As result, at the outputs of the first 3 and the second 4 channels in the first frame pyrosignals are formed. Pyrosignals of both channels consist of pedestal signals useful different polarity signals of targets. Besides that there are components in output signals of both channels that are determined by defects of pyrovidicon targets, as well synchronous and nonsynchronous noise. The signal of difference processing of the first and the second channels is formed at the output of unit 5 that is showed for two adjacent frames. Analog difference processing of pyrosignals may be realized by differential amplifier. The commutation is realized in such way that signals with negative useful component goes always onto inverse input and with positive – onto direct input. On the output of unit 5, positive signals are formed in both adjacent frames for each of adjacent frames. The result of difference processing of pyrosignals of the first and the second channels is instantaneous compensation of synchronous and nonsynchronous noise in output signal. At the same time useful signal grows. Unfortunately, the efficiency of differential processing decreases because of components in signal, that are connected with defects of targets. Authors propose to use processor of frame-by-frame processing – summation of the signals of adjacent (the first and the second one) frames. In resulting signal the useful component is much more, the pedestal components decrease to the minimum or disappear on the whole, as well as static signals of target defects and components of synchronous and nonsynchronous noise. It is very important that output resulting signal is formed in every frame of readout process from pyrovidicon targets of the first and the second channels.

## III. CONCLUSION

Proposed by authors optimization of the process for difference signal forming and frame-by-frame summation of adjacent frames allows to decrease requirements to identity of both channels of IR camera and to minimize influence different kinds of noise. As result the quality of thermal images may be much more qualitative.

## REFERENCE

- [1]. I. Bozhenko, Z. Hrytskiv, P. Kondratov. Thermovision camera with enhanced noise immunity and possibility to obtain stereo image of an object. Proc. “Modern Problems of Radio Engineering, Telecommunication and Computer Science”, Lvov, Lvov Polytechnic National University, 2004, pp. 517-519.