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**EVALUATION OF PROTECT INFORMATION FROM LEAKING VIA
THERMAL CHANNELS**

**1-98 80 01 «Methods and systems of information protection, information
security»**

**Thesis synopsis
for the degree of master of science**

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INTRODUCTION

Information security today – the most important sphere of human activity, one of the pillars of which is the protection of information from leakage through technical channels, in particular thermal, where information is presented in the form of physical fields infrared (thermal) range.

The emergence of such a channel leakage due to the presence of remote sensing (thermal). Capable of detecting the difference in temperature between the object and the background on which it is located, which allows you to implement the process of detection, recognition and identification.

Countering interception of information on the thermal channel is realized by use of the thermal protection, which are fixed on the surface of the protected object and allow for reduction in the temperature of its surface.

The basis of such technical means put the absorption of heat flow of the protected object through the use of a wide range of materials. High-intensity heat exchange between this material and the object to be protected leads to a significant excess of the surface temperature of the material above the temperature of the background, that hosts the object. In addition, for thermal protection designs use of heat shields with forced cooling of coolant in gaseous and liquid forms. The disadvantage of such designs is the presence of a heat exchanger with a surface temperature exceeding the temperature of the background. Existing construction thermal protection have significant value, which requires the development of new high-tech means of passive protection against leakage of information on the thermal channels. Of particular practical interest is the development of highly effective thermal protection to dynamically control the temperature of the surface, that is appropriate for moving protected objects moving on the underlying surface, and backgrounds with different temperatures. This paper presents the results of research and development means to the thermal protection manage able variable surface temperature, that is realized by varying the speed of the coolant, cooling the surface of the means. The practical use of such structures to reduce the range of detection, identification and identification of ground targets.

GENERAL DESCRIPTION OF THE WORK

Communication of operation with large scientific programs (designs) and themes

The theme of dissertational operation is confirmed by the order of the rector of establishment of formation «the Belarus state university of information science and radio electronics» № 385 from 30.12.2010 and matches to subsection 5.5 "Methods, resorts and production engineering of maintenance of the informational safety at machining, storage and a data transfer with cryptography use» the priority directions of fundamental and applied scientific examinations of Byelorussia for 2011-2015, confirmed by the Decision of Ministerial council of Byelorussia on April, 19th, 2010, № 585. Operation was carried out in formation establishment «the Belarus state university of information science and radio electronics».

The purpose and research problems

The purpose of dissertational work consists to working out of a technique of an estimation of decrease thermal perceptibility land installations in the infra-red range and its approbation with use of means of a thermal protection

For object in view achievement it was necessary to solve following problems:

1. To develop a technique of an estimation of efficiency of means of a thermal protection.
2. To execute approbation of the developed technique.

The personal contribution of the competitor

All basic results stated in dissertational work, are gained by the competitor independently. In in common published works the author possesses definition of the purposes and statement of research problems, sampling of methods of research, direct participation in conducting of experiments on working out of designs of means of a thermal protection and studying of properties, and also machining, the analysis and interpretation of the gained results, the formulation of leading-outs

Approbation of effects of the dissertation

Substantive provisions and effects of the dissertation were discussed at XII Belarus-Russian scientific and technical conference "Hardware components of protection of the information" (Minsk, 2014).

Publications on a dissertation theme

By results of the examinations presented to the dissertations, 1 operations, including 1 papers in collectors of materials of conferences are published.

CONCLUSION

1. The procedure of an estimate of efficiency of means of protection of the information from leakage on the thermal channels is offered, allowing to count the picking-up range, the recognition and identifications of installation of observation on the basis of effects of laboratory measuring of temperature of a surface of the module of a resort of a thermal protection taking into account temperatures of a surface of defended installation and a background on which it is disposed, weather conditions of observation and the basic technical characteristics thermovision techniques that allows to prove demands to constructions of modules of resorts of a thermal protection and their integral cooling systems for their sharing at decrease thermal visibility land installations.

2. Introduction of an air stream with velocity to 1 m/s between a construction of a resort of the thermal protection which has been carried out on the basis of a fibrous material, containing in the volume an aqueous solution of chloride of calcium, and the defended installation which is heated up to temperature 120°C is installed, that, allows to stabilise a moisture content of a resort of a thermal protection.

3. The flexible structural construction of the base module of a resort of the thermal protection which has been carried out on the basis of a polyamide knitted linen which surface is coated with the lavsan metallized by aluminium is developed. Stratum of a knitted linen are joined with each other in such a manner that contact between stratum of the metallized lavsan is provided. It is offered to use for cooling of a surface of such module water, moving on the pipeline fixed between stratum of metallized lavsan that allows to reduce temperature of a surface of such module of a resort of a thermal protection with 45...47°C to 31...32°C during 5 minutes of operation of an integral cooling system at running speeds of heat-transfer agent 0,023...0,079 m/s (radiant temperature IR-radiations 115°C). It is installed, that temperature of a surface of such construction at its cooling by an air stream, moving with velocity not less than 0,8 m/s and inducted between the module of a resort of a thermal protection and the IR-radiation radiant (temperature 170°C), allows to provide value of temperature of a surface of the module no more than 29°C at its cooling within 7 minutes. Is installed, that simultaneous cooling of such construction by air (a running speed 0,63...0,98 m/s) and water (a running speed 0,023...0,079 m/s) allows to reduce temperature of its surface with 45...47°C to 24...27°C during 4 minutes of operation of an integral cooling system (temperature of a radiant of IR-radiation 170°C).

LIST OF PUBLICATIONS

1. Али Хамза Абдулкадер Абдулькабер. Методика оценки эффективности средств тепловой защиты / Али Хамза Абдулкадер Абдулькабер, Альджибави Мунтадер Рахим Маджид // XII Белорусско-российская научно–техническая конференция "Технические средства защиты информации" : Тезисы докладов, 28 -29 мая 2014 г. / БГУИР ; редкол.: М.П. Батура [и др.]. – Минск, 2014. – С. 50.

Библиотека БГУИР