2.20. INSTRUMENTAL MEANS ON THE BASIS OF NDT METHODS FOR SOLUTION OF PROBLEMS OF ENCLOSING STRUCTURES TESTING

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Currently, problem of remote detection of small-size retroreflecting objects and abnormal temperature zones on surfaces of various objects is extremely topical, while its solution is imperious. Application of non-destructive testing methods possessing with very wide informational possibilities is one of the directions of such technical problem solution.

In the result of researches and developments directed toward creation of such equipment, the series of instrumental means used for solution of mentioned problem is created in the NIIIN MNPO "Spektr". They include optoelectronic system SPRUT containing two data receiving channels: thermal imaging channel and channel of laser location. Thermal imaging channel contains IR-transducer based on the non-cooled bolometric array of 4,500 series in the format of 320 × 240 pixels. Own thermal sensitivity of array is equal to 50 mK with pixel size of 30 × 30 μm, which reduces geometrical dimensions of full-format array and makes it possible to use long-focus lens of relatively small dimensions. Laser location channel can operate in two modes: first – mode of active night viewing device (NVD); second – mode of detection of retroreflecting objects under their retroreflection.

Optoelectronic system SPRUT is a portable instrument intended for solution of problems of informational security at small distances. Combination of two channels makes SPRUT equipment a versatile means for surveillance and reconnaissance.

New development called as Spektr-4 represents by itself multichannel module located stationary at the observation post or on transport means. This product is a stationary multichannel system installed on the P&T device and includes following channels:

– thermal imaging channel on the basis of solid-state multi-element IR-array in the format of not less than 320 × 240 elements equipped with a lens having focus length of more than 100 mm;

– laser location channel similar with one implemented in the "SPRUT" equipment;

– TV channel of near IR-range (0.95 – 1.9 μm);

– wide-spectrum TV channel with possibility of image spectral filtration by narrow-band filter (width of 20 – 30 nm) within the range of 0.4 to 1.1 μm. Equipment appearance with the block of monitors and in the option of installation on a transport means is presented in fig. 1.

The complete set of equipment includes lifting device. In the state of transportation, optoelectronic module with P&T device is lowered inside the cabin and fixed. Equipment is controlled manually. Rotation angles of R&T device: 360 degrees in horizontal direction; –40 to +60 degrees in vertical direction.

Equipment can be equipped additionally with powerful IR projector. In this case, the last two channels can operate in active mode.

Currently, mentioned systems are applied actively in practice and provide solution of tasks of quite wide spectrum related with the problem of informational security.

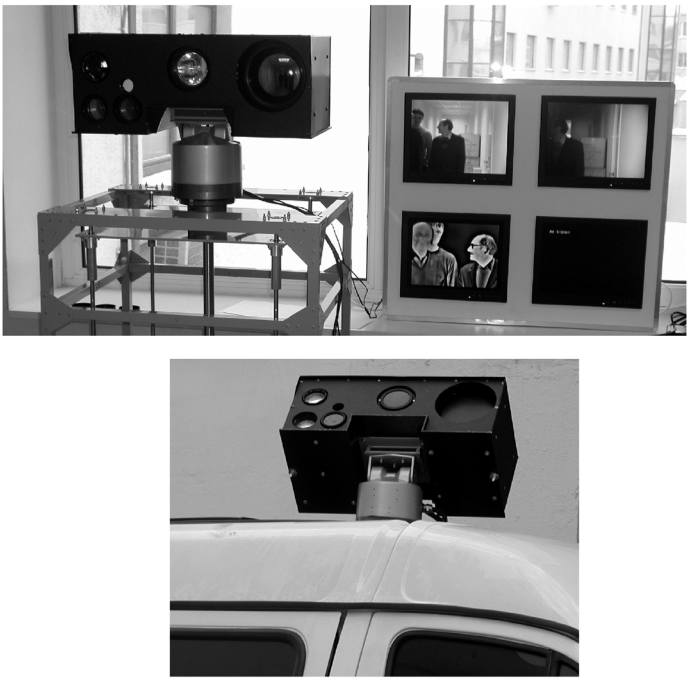

Fig. 1. Appearance of 4-channel system “Spektr”