

SATELLITE SYSTEM OF CARTOGRAPHICAL FUNCTION AND HER ROLE IN FORMATION OF THE RUSSIAN INFRASTRUCTURE OF A SPATIAL DATA

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The basic source of the initial information used for creation and development of the Russian infrastructure of the spatial data (RISO), are the materials of space shootings received in various ranges of electromagnetic fluctuations.

Most widely in world practice a seen range of electromagnetic fluctuations now is used, and also the radiorange, interest to which abroad sharply has increased recently, what it is possible to judge on recent start spacecraft (SC) TerraSAR-X, Cosmo-SkyMed and about the plans of the further start with the purpose of creation of systems of the radar SC with the resolution 1 m is not worse.

In Russia with her adverse climatic and meteorological conditions (the average value of probability unclouded of weather during of the spring-summer-autumn period does not exceed 30 %) action connected with high detailed remote sensing are a little worse. Real radar SC ensuring of the reception of materials of space shooting in unclouded conditions is not present. In development is SC "Condor-E" of double use, the date of which start still is not determined, and designated in the Federal space program on 2006-2015 SC "Arcon-2" is not developed in connection with absence of a source of financing.

On an orbit in working order there is unique domestic multi-purpose SC of optoelectronic detailed supervision "Resource-DK" № 1, focused on the decision of tasks of monitoring type.

High resolution panchromatic spanshots with SC "Resource-DK" № 1 in the certain degree can supply the decision of a task of updating topographical maps at the scale 1:25 000, however irrational covering of inter-tracks intervals by strips of capture, absence of realization of shootings in nadir, absence exact data about elements of external orientation essentially complicate processing of information with "Resource-DK" № 1 for creation large-scale cartographical production on territory of Russia. At the same time abroad successfully function specialized cartographical SC (in particular, Indian Cartosat, Japanese ALOS), which provide cartographical branch with the space information with required measuring quality. Except for the listed lacks it is necessary once again to note influence characteristic for Russia of the meteorological factor. So in 2007 within the framework of the application of Roscartography volume 5 mln sq km with "Resource-DK" № 1 made shooting of territories with the total area 2,6 mln sq km and suitable for the further processing there were materials on the common area only 1,8 mln sq km. Let's notice, that on SC ALOS, except for the equipment working in a seen range of a spectrum, is established also radar.

So, for maintenance of acceptable quality of the created and updated spatial data (SD) initial materials of space shootings should have necessary representational and measuring properties allowing to receive required information on ground objects and to make the measuring cartographical documents.

It is possible to allocate the following structure of materials of space shooting necessary for qualitative manufacture SD:

1. Materials of stereoscopic panchromatic shooting in seen range of a spectrum for construction of a topographical basis. The basic quality these materials - minimal geometrical distortions. An obligatory condition – presence of data about elements of

external orientation and accuracy of their definition on the moment of shooting, and also data on elements of internal orientation of shooting equipment received at a stage ground of tests.

2. Materials panchromatic and multizone shooting in a seen range spectrum for filling a topographical basis. The basic quality of these materials – high resolution on locality.

3. Materials of shooting in a radiatorange for construction topographical bases and its fillings. The basic quality of these materials - possibility of reception of the images with the high resolution on locality in characteristic for average and northern territories of Russia bad meteorological conditions. The shooting should be carried out with use of various variants of polarization, and also with possibility of use of a interferometry method, with which use it is possible quickly and qualitatively to receive materials of a relief.

Development SC, allowing to receive the listed above materials of space shooting, within the framework of budget financing it is not represented possible, but it is quite feasible with use of the mechanism of state - private partnership. The ballistics of this system can be constructed so that without damage the performance of shootings in interests Roscartography could also receive materials of space shooting in view of the requirements of other departments acting as the private investors.

One of the expedient scheme of construction of a space segment ensuring reception of materials of space shooting, necessary for qualitative manufacture SD, represents the scheme, in which the space segment consists of following four space vehicles:

SC of optoelectronic supervision providing stereoscopic panchromatic shooting with the resolution not worse 1,5 m;

SC of optoelectronic supervision providing panchromatic and the multizone information with the resolution about 0,5 m and 1,5 m accordingly;

two SC of radar-tracking supervision working in a tandem and providing shooting with various polarization with the resolution from 1 m and worse, and also interferometry shooting.

The space segment in such structure will allow to remove obvious lacks of existing system of maintenance of the consumers by materials of space shooting, will allow in complete volume to receive the information in interests Roscartography and will raise efficiency of use of data of remote sensing in various branches of socio economic sphere, that to the full answers the decisions accepted March 29, 2007 at session of Presidium of State council of Russian Federation in Kaluga.

The development of offered four-satellite system can be carried out with use of modern space technologies, on a new platform, in view of the tendencies to creation small SC, not requiring for launch of heavy spacerockets, and also with use of the new equipment of remote sensing of the for providing of competitive information, with the high resolution and selective transfer of data on a ground means of reception of all participants of the project.