

# Communication Canal of Small-Size Spacecraft on the Base of Space Communication System GLOBALSTAR

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**Abstract.** Usage of the present global satellite communication systems of the general purpose for control of small-size spacecraft is considered to be a perspective and low-cost direction. The most suitable system to fulfill this task is the GLOBALSTAR system. For the first time a communication channel with this system was implemented on the nanosatellite TNS-0 № 1 in 2005.

The article shows the results of the comparative analysis of the experimental data received from TNS-0 № 1 and a computer modeling of the mission conditions on the software package "Radio coverage zone of TNS-0". Favourable communication conditions in which a technology for small-size spacecraft control with use of the GLOBALSTAR system is very effective, low-cost and operationally convenient, as well as realized both in stationary and mobile variants, are defined. It is determined that the area of space where communication can be possible is a so called "cone of communication" in which a small-size spacecraft, GLOBALSTAR spacecraft and ground gateways should be at one time.

The article describes specific causes of lack of communication. Practical recommendations on increasing the amount and duration of communication sessions are given. A new way for communication channel organization using GLOBALSTAR satellite communication systems is proposed. The results of the ground tests are presented.

**Keywords:** nanosatellite, small-size spacecraft, GLOBALSTAR, space communication system, zone of radio visibility