Selection of the Assistance Data Transfer Protocols through Cellular Channels for the A-GLONASS System

S. V. Trusov[1], **O. I. Baraboshkin, S. A. Bobrovskiy**

[1]*candidate of engineering sciences,*
Joint Stock Company "Russian Space Systems"
e-mail: ipelka@mail.ru

Abstract. The widespread adoption of satellite navigation technologies in everyday life leads to the fact that most users of navigation receivers are located in urban areas or parks, i. e. the areas in which the deterioration of navigation signals occurs. The A-GNSS is employed worldwide to improve the quality of navigation. The technology is designed to provide assisted information to the navigation receiver using a mobile networks. The study is conducted as a part of development of the A-GNSS version, oriented primarily to the GLONASS system user equipment. The results of the searching for the optimal method to provide the assistance information to the user device are reported in the article. The method takes into account various possibilities of the existing navigation equipment.

The analysis of the composition of the necessary assisting information is carried out. The possibilities of the existing protocols are examined; the requirements for data transmission protocols in the future system are drawn up. It has been shown that today there is no universal standardized protocol for the assistance information transfer without the reference to networks standards, except the SUPL standard, which is supported by most modern smartphones. However, the SUPL standard is resource-intensive and redundant for the assistance information transfer, which makes it unpopular with the producers of the budget trackers and navigators. For these devices, the authors have developed the FNM protocol, undemanding to the computing and network resources. The data package for a quick start of a navigation receiver is 3 Kb with FNM. The protocol allows the user to request and receive the entire range of the assistance information and supports the monitoring of the changes in cellular network topologies and subscriber location.

As a result of consideration of the potential protocols, it has been decided to implement the support for both SUPL 2.0 standard and the FNM protocol in the future system for the transmission of the assistance information.

Keywords: assisting systems, A-GPS, A-GLONASS, SUPL, FNM