

TOTAL STATIONS VERSUS GPS SYSTEMS

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The development of geodesy as a science and construction in general, requires the use of modern technologies and equipment that save resources and increase efficiency. Over the past few years, geodetic equipment has been rapidly improved and modernized, their functional features have significantly expanded, technical characteristics have improved. It is proved that modern satellite technologies in combination with computerization have become a real alternative to traditional types of geodetic measurements.

That's why modern geodetic technologies are based on the use of electronic geodetic instruments and software for processing measurement results.

If we begin to list the main groups of modern geodetic instruments, and not pay attention to the areas of application and we will face a question: "What is better - a total station or GPS-based equipment?" [3]

Geodetic GPS equipment is mainly used to create reference networks and develop survey justification, especially in those places where there is a rare network of starting points. Of course, with the help of GPS, you can make surveys and even take out projects in nature, however, GPS still has not found wide application in these types of work for a number of reasons. And not the last place in this series is occupied by the high cost of the necessary equipment.

Electronic total stations are the most common group of geodetic instruments. This is due to the fact that they have the widest range of applications: from the development of GGS and topographic surveys to engineering geodesy and land management [2].

The device is usually equipped with a full-featured alphanumeric keyboard on both sides. This provides quick access to the main functions of the device and quick entry of data, codes and point names. Large graphical display of function keys allows to control the tool, enter and use the necessary information easily and quickly [1, p.94].

Table 1 highlights the advantages and disadvantages of these geodetic instruments.

	Advantages	Limitations
<i>Electronic total station</i>	Low cost	High requirements for software
	Can work in all weather conditions	Charging the device from the battery
	Automatic calculation of horizontal distances	Long-term performance of work

	Fast work on a flat route	
<i>GPS system</i>	Advantages	Limitations
	Ease of use	High price
	Quick measurements	Distortion and signal processing delay
	Portability	Adverse weather conditions
	Measurements are recorded on a USB stick	Terrestrial radio sources can interrupt the signal
	Automation	
	Accuracy	

Based on these data, we can conclude that both tools have their advantages and disadvantages, and they do not differ significantly from each other. Each of these devices can be useful depending on the situation. For example, if it is a flat surface, it is better to take measurements with a total station, but in the case of mountainous area, the data obtained with the GPS system will be more reliable.

References

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