

Application of Unmanned Aerial Vehicle Remote Sensing Technology in Surveying and Mapping Engineering

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Abstract: With the continuous growth of social economy, the development of surveying and mapping engineering industry in China has made a qualitative leap. With the acceleration of urbanization construction, the number of construction projects is also increasing. In the construction of the project, the most important thing is the surveying and mapping project, which is an important condition to ensure the smooth construction of the project. In surveying and mapping engineering, the relevant staff should give full play to the role of unmanned remote sensing technology, optimize and adjust surveying and mapping work flow, and complete data collection, processing, modeling and other related tasks. Based on the analysis of UAV remote sensing technology, this paper focuses on the application of unmanned aerial vehicle remote sensing technology in surveying and mapping for reference.

1. The Development of Unmanned Aerial Vehicle Remote Sensing Technology

In recent years, China's unmanned technology has made great progress, and products have begun to export to foreign countries. Experts clearly pointed out that with the continuous improvement of unmanned equipment and the continuous strengthening of service team, China has been able to successfully use unmanned to realize the construction of national economy, and the development of unmanned has entered a new era. The essence of unmanned aerial vehicle remote sensing technology is to use advanced remote sensing sensor technology, unmanned aerial vehicle technology, remote sensing and remote control technology, remote sensing application technology and communication technology to obtain the remote sensing information of land and resources, ecological environment and other space ranges scientifically, effectively, intelligently and automatically, and to complete the remote sensing data processing, modeling and application analysis at the same time with unmanned remote sensing system has the advantages of rapidity, maneuverability and economy. In the traditional ground surveying and mapping information collection work, people usually rely on manned aircraft or satellite for information collection activities. The disadvantages of this way are high economic cost, easy to be affected by the external climate and slow update speed, etc., which will lead to the stable and sustainable development of the upper limit Engineering Surveying and mapping work to a certain extent. By using unmanned aerial vehicle remote sensing technology in engineering surveying and mapping, it can play its advantages of simple operation, low cost and clear imaging, and help staff to obtain accurate and reliable data information in the shortest time. In addition, the application of unmanned aerial vehicle remote sensing technology can quickly update and upgrade the geological environment information and outdated GIS database, and provide effective data support and technical guarantee for the smooth development of land management and geological environment management of relevant departments of the national government.

2. Application Advantages of Unmanned Aerial Vehicle Remote Sensing Technology in Surveying and Mapping Engineering

2.1 Easy to combine with other systems, high efficiency of information processing

In surveying and mapping engineering, by applying unmanned aerial vehicle remote sensing technology to the monitoring work in the designated area, surveying and mapping technicians can realize the rapid processing and analysis of various data and information in the area, comprehensively improve the efficiency of information collection and acquisition, at the same time, ensure the accuracy of various data and information, and avoid the error of Surveying and mapping data and information due to the error of manual surveying and mapping Wrong phenomenon. Modern surveying and mapping engineering can not rely on a kind of remote sensing technology completely, and the application of unmanned aerial vehicle remote sensing technology is no exception, because there are likely to be some technical loopholes. Therefore, in order to solve this problem, the staff need to combine the remote sensing system with each other organically, give full play to the advantages of different systems, and make up for the shortcomings between the systems. The advantage of unmanned aerial vehicle remote sensing technology is that it can fully integrate and integrate with other systems, and ensure good engineering mapping effect scientifically.



Figure 1: Use entertainment



Figure 2: Research

2.2 Unmanned remote control technology has a wide range of monitoring and high accuracy

Surveying and mapping engineering can not be separated from monitoring work. The level of monitoring work is directly related to the overall work quality of Engineering Surveying and mapping. The biggest application advantage of unmanned aerial vehicle remote sensing technology is the high level of monitoring work. When the staff are dealing with the emergency, they can solve the corresponding problems scientifically and efficiently by using unmanned aerial vehicle remote sensing technology reasonably to avoid serious economic losses. In order to improve the monitoring effect, surveying and mapping technicians must pay attention to the smooth implementation of small-scale monitoring. By applying unmanned aerial vehicle remote sensing technology to monitoring operations, they can realize the monitoring of small-scale objects and maximize the stability of the engineering surveying and mapping range. In addition, with the assistance of unmanned aerial vehicle remote sensing technology, the actual data and information in the monitoring target area can be presented in the equipment in three-dimensional form, so that the staff can understand the data and information intuitively and clearly, so as to ensure the high quality of Surveying and mapping engineering.

3. Application of Unmanned Aerial Vehicle Remote Sensing Technology in Surveying and Mapping

3.1 Acquisition of Surveying and mapping image data

In surveying and mapping, the use of unmanned aerial vehicle remote sensing technology should make a reasonable choice of the flight platform. The choice of the flight platform should be based on the characteristics of terrain and landform, and should be carefully selected. Compared with the traditional methods of image acquisition, unmanned aerial vehicle remote sensing technology can correct and repair the problems in the process of image data acquisition by using aerial triangulation measurement technology. Sometimes there are loopholes in the process of image acquisition, but this technology can be effectively avoided. In the process of acquiring surveying and mapping image data by unmanned aerial vehicle remote sensing technology, the commonly used technologies are turn buffer, exposure delay compensation, flight attitude control, etc.

3.2 Measurable analysis of complex environments

In the unmanned data collection work, because the main body of data collection is different, it can be divided into two methods: automatic encryption part and manual collection. In the internal control system of unmanned, automatic encryption is one of the self-protection mechanisms. After collecting the information and data, the sensors and shooting equipment of unmanned will temporarily store the information inside the machine, and encrypt the memory, so the data will be very safe. If the staff want to get internal information, they can only get corresponding access rights. By using this automatic encryption technology, the quality is more reliable, and the security of data is also improved. However, manual acquisition is mainly the use of computer remote control technology. According to the actual acquisition needs in the base station, the staff will operate the unmanned opportunity to selectively shoot and further acquire information and data.

3.3 Data collection and processing

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Figure 3: A new one using for the weather



Figure 4: Use in agriculture

4. Conclusions

Totally, the application analysis of unmanned Remote Sensing Surveying and mapping technology is helpful to the efficient application of this technology. As a new technology, it is widely used in modern surveying and mapping engineering. Through the scientific and reasonable application of this technology, it can maximize the quality and efficiency of Surveying and mapping engineering, provide comprehensive, accurate and rich data information for surveying and mapping personnel, fully guarantee the accuracy of Surveying and mapping, and promote the stability and sustainable development of the whole industry.

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