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Application and analysis of remote sensing technology in engineering survey

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Abstract: The introduction of UAV technology in the field of engineering survey can measure and photograph complex terrain areas in the air, obtain the detailed data of these areas, and improve the quality and efficiency of survey work. UAV technology has gradually matured and improved, and has been widely used in practice and achieved good results. When UAV remote sensing technology is applied, a reasonable measurement scheme should be formulated to ensure the effect of technology application.

Keywords: remote sensing technology; Engineering survey; Application: analysis

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1.Introduction

Present situation and application of Engineering Survey Technology.Engineering survey develops rapidly, but there are problems of overlapping or unclear functions in government departments, technical standards are not updated in time, and technical management specifications are imperfect, which directly affect the improvement of engineering survey level. For example, during the engineering survey, the technical implementation standards are not unified, and the charging standards are also different, which is easy to cause market chaos. In addition, the implementation standard of engineering survey is not perfect, resulting in disputes over area survey. Modern society needs a large number of high-quality comprehensive surveying talents. Only with excellent quality can we have a foothold and development in the industry. At present, some employees do not pay attention to their own work, or do not have a correct understanding of engineering survey work. They can pass through their work and do not play their own role. At present, most employees lack the spirit of active learning, and few people take the initiative to learn in their spare time, which affects the improvement of measurement quality [1]. When UAV remote sensing technology is applied, a reasonable measurement scheme should be formulated to ensure the effect of technology application. The introduction of UAV technology in the field of engineering survey can measure and photograph complex terrain areas in the air, obtain detailed data of these areas, and improve the quality and efficiency of survey work. UAV technology is gradually mature and perfect, which has been widely used in practice and achieved good results.

2.Background

2.1. Research Value

There is a lack of perfect engineering geographic information system in the whole industry. For example, the real estate survey and cadastral survey are not unified, resulting in inconsistent data. There is often a mismatch between superstructure and land use. The “Zong” in Cadastral Survey and the “hill” in real estate survey cannot be consistent, and it is normal to have inconsistent data [2]. The “Zong” in Cadastral Survey and the “hill” in real estate survey cannot be consistent, and it is normal to have inconsistent data. There is a lack of perfect engineering geographic information system in the whole industry. For example, the real estate survey and cadastral survey are not unified, resulting in inconsistent data. There is often a mismatch between superstructure and land use. Engineering survey develops rapidly, technical standards are not updated in time, and technical management specifications are imperfect, which directly affect the improvement of engineering survey level but there are problems of overlapping or unclear functions in government departments,. For example, during the engineering survey, and the charging standards are also different, which is easy to cause market chaos. In addition, the technical implementation standards are not unified, the implementation standard of engineering survey is not perfect, resulting in disputes over area survey.

2.2 Present situation of this test

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Application and research analysis of UAV Remote Sensing Technology.UAV remote sensing technology has the advantages of high flexibility, simple operation and low operation cost. Therefore, it has been widely used in practice and has become the main means of aerial remote sensing technology. The so-called UAV remote sensing technology refers to the integration of UAV, remote sensing technology, data transmission and other advanced technologies to improve the measurement task with high efficiency, high quality and automation [3].

UAV can obtain high-resolution aerial survey data and images when flying at low altitude, which has more significant advantages than traditional aerial survey technology or remote sensing technology. During traditional aerial survey, clouds will interfere with the results. UAV aerial survey technology belongs to low altitude operation. Clouds will not excessively affect the measurement effect, or even be affected by clouds and fog. The flight scheme will be adjusted in time according to weather changes, reduce cost losses and promote the improvement of measurement quality. Compared with manned aerial survey technology, UAV remote sensing measurement technology has low operator training, equipment maintenance and use costs in the whole project. Although the investment cost is reduced, the operation quality has not decreased. Users can adopt appropriate operation methods according to their needs. Most UAV operations will not be affected by the application of remote sensing technology at low altitude. The so-called digital orthophoto technology refers to the use of DEM technology to correct, mosaic and cut aerial photos, and obtain the final aerial survey data. The image data obtained by UAV aerial photography mainly includes two types: JPG original photo data and camera POS data. The data acquisition of UAV remote sensing technology should go through the established process. To realize the process and key points of UAV remote sensing technology data acquisition, the surveyors are required to formulate an appropriate survey scheme according to the actual situation. For rapid processing of UAV data, the field measured control data should be considered.

2.3Test results

There are many kinds of route laying methods during UAV flight, mainly including heading laying and side laying. The former is mainly in the part parallel to the boundary line of the flight area. In order to ensure that the photo coverage on the boundary meets the requirements of 30%, the first and last routes are generally designed on or outside the boundary line. Before the UAV remote sensing aerial photography starts, the surveyors need to conduct field survey, select the site suitable for UAV take-off and landing, and formulate appropriate routes according to the survey needs. In addition, emergency plans should be formulated to complete the survey by means of field survey. The side laying shall exceed at least one baseline of the boundary line. Considering the take-off and landing mode of UAV, select the site suitable for measuring the take-off and landing of UAV. If the aerial photography task is not acute, select the appropriate site according to relevant regulations and requirements: more than 10 ㎞ away from the recent fields, the take-off and landing site is flat, there are no obstacles around, there are no high-voltage poles and important facilities within 200m of the take-off and landing site, and carry out plane transformation according to the take-off requirements, Clean up the hard objects or protrusions within the scope. If the aerial photographing task has zones, each zone shall ensure its full width. Meanwhile, during the field survey, the portable handheld GPS device is used to select the target coordinates, and the flight altitude of UAV remote sensing measurement is determined according to the collected data and images to ensure the accuracy of the measurement results [4].

Specific measures to improve the quality of UAV remote sensing measurement UAV remote sensing technology has the advantages of high flexibility, simple operation and low operation cost. Therefore, it has been widely used in practice and has become the main means of aerial remote sensing technology.The so-called UAV remote sensing technology refers to the integration of UAV, remote sensing technology, data transmission and other advanced technologies to improve the measurement task with high efficiency, high quality and automation.An important measure to ensure the quality of engineering survey is to improve the technical management system. For example, in real estate measurement, the shared area is measured and calculated for many times to avoid errors and control the errors within a reasonable range. During engineering survey, the supervisor shall timely check the survey process and results, check the identification records and process them by computer. When the measurement quality problem is found, it shall be handled in time to ensure the scientificity and rationality of the data. During engineering survey, technicians strictly control the quality of each link. During the survey, they carry out it many times and calculate the average value. When the data is fuzzy and difficult to define, technicians can re measure and calculate it to ensure the authenticity of the results. During the secondary detection, the flight route shall be decomposed to ensure the accuracy and comprehensiveness of the flight route. At the same time, when collecting specific aerial survey data, measures should be taken to improve the camera resolution of UAV. The acceptance is to select appropriate inspection methods to ensure the rationality of technical indicators and successfully complete the engineering survey objectives. The acquisition of telemetry data is mainly obtained by manual or automatic methods, or the

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automatic and manual methods can be integrated. According to the work content of different measurement areas, the measurement content shall be fed back or communicated in time to ensure the quality of the obtained data; After obtaining the first UAV data, start the secondary detection during the recording process. Further ensure the accuracy and authenticity of aerial survey data; During the period of acquiring the data required by the measurement work by using UAV technology, in addition to detecting the data, the data analysis technology should also be used to analyze the prepared data obtained by the detection, so as to form accurate data, so as to ensure the quality and efficiency of the measurement work.

3.Conclusion

Engineering Surveyors actively study and participate in professional training to help technicians master advanced measurement methods and technologies, improve their professional quality and skill level, and avoid falling behind the market requirements. By improving the measurement level of surveyors, the error is controlled within a reasonable range and the measurement accuracy and accuracy are improved. Continuously introduce high-quality surveying talents in the industry to improve the overall quality and level of the surveying team. Build a team of high-quality measurement technicians, formulate a reasonable performance appraisal system, and stimulate the enthusiasm and initiative of technicians. [5] UAV operators actively participate in business training and skill training, continuously update operation concepts and skills, improve the technical level of operators, select appropriate training items, reduce the rotation angle of UAV, ensure that the UAV is in a constant speed state during flight, and improve the authenticity of data acquisition. If the aerial photography task is not acute, select the appropriate site according to relevant regulations and requirements: more than 10 ㎞ away from the recent fields, Considering the take-off and landing mode of UAV, select the site suitable for measuring the take-off and landing of UAV. he take-off and landing site is flat, there are no obstacles around, there are no high-voltage poles and important facilities within 200m of the take-off and landing site, and carry out plane transformation according to the take-off requirements, Clean up the hard objects or protrusions within the scope.

This paper briefly summarizes the UAV remote sensing measurement technology in order to improve the measurement quality and efficiency, analyzes the shortcomings of UAV remote sensing measurement technology in detail, and expounds the key points of UAV remote sensing measurement technology in connection with the specific application process, so as to promote the overall improvement of measurement technology level. It is hoped that this paper can provide reference for similar research. After obtaining the first UAV data, start the secondary detection during the recording process. The acquisition of telemetry data is mainly obtained by manual or automatic methods, or the automatic and manual methods can be integrated. [5] According to the work content of different measurement areas, the measurement content shall be fed back or communicated in time to ensure the quality of the obtained data; An important measure to ensure the quality of engineering survey is to improve the technical management system. During engineering survey, technicians strictly control the quality of each link. During the survey, they carry out it many times and calculate the average value. When the data is fuzzy and difficult to define, technicians can re measure and calculate it to ensure the authenticity of the results.

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