Research on the role of new electronic information technology in the development of modern avionics equipment

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Abstract. With the rapid development of China's economy, electronic information technology plays an increasingly important role. New electronic information technology, as the backbone of supporting our national economy, plays an irreplaceable role in ensuring the high-quality development of science, technology and society. The new electronic information technology has the advantages of fast operation speed, high safety and reliability, high working efficiency, strong universality and simple operation. Therefore, in order to better play the role of the new electronic information technology in the society, this paper studies it to better serve the modern industry and facilitate the long-term development of the society. New electronic information technology plays an important role in transportation, engineering management, aerospace and other industries, especially in the application of avionics system.

Keywords: New electronic information technology, avionics, development and research

1. New electronic information technology project

Electronic information technology engineering is a comprehensive subject, which is based on computer network to collect, store and sort out the information, and finally realize the processing of modern electronic information. With the continuous development of society and information technology, electronic information technology engineering has been integrated into all walks of life, bringing new challenges and opportunities for the development of the industry [1]. Through the cooperation and development of modern electronic information technology and many kinds of science and technology, the development space of electronic information technology engineering is further expanded, and the stability and effectiveness of electronic information technology are improved. Trading volume of aviation technology refer to figure1.
2. Development status of new electronic information technology

Electronic information technology is a high technology, its role cannot be ignored. As the theme of the world today, economic globalization has greatly promoted the development of electronic information technology, which has gradually become one of the basic supports of China's economy and promoted the pace of industrial transformation in China [2]. Today, with the rapid development of science and technology, electronic information technology transforms the traditional electronic information simulation system into electronic information digital system, so as to drive the research and development of new products, and finally realize the development of modern electronic information technology engineering with high security, high accuracy and fast rate. Airline Data Analysis and system evaluation refer to figure 2.

3. Development process of Avionics Communication System

Avionics was born in the 1970s, avionics equipment is an important part of the aircraft, the early avionics system is mainly responsible for the take-off, navigation, landing, the contact between pilots and the ground. With the improvement of the level of aviation technology, the nature of aircraft work has also been expanded. At the same time, modern digital technology and microelectronics technology are also rapidly developing and applied in the avionics technology. All countries are developing the aviation industry. The future war is mainly space war, which requires the advanced avionics equipment to gain
advantages in the war. The development of avionics system has become the basis of aircraft combat capability. The improvement of avionics equipment has greatly increased the combat effectiveness and service life of aircraft [3]. The development of avionics is also promoting the development of aerospace industry. There are many fields covered by avionics, and now avionics system adopts integrated structure. Because of the long development time and long service period of military aircraft, it is very difficult to maintain the aircraft. Because of the long service time, some parts have been stopped production, and the aircraft is damaged without replacement parts. Only the continuous upgrade of the aircraft can avoid such incidents.

The development stage of avionics system structure can be divided into vertical, combined, integrated and advanced. In these processes, information technology means are continuously enhanced to meet the increasing requirements of aircraft performance. The functions of the discrete avionics system are separated, which makes the performance of the aircraft unable to be used comprehensively. The joint structure makes the avionics system integrated, simplifies the connection between equipment, reduces the load of equipment to the aircraft, and realizes the information sharing of all systems. This avionics system structure is applied to the current military aircraft in China (Figure 1). The structure of the integrated avionics system further improves the comprehensive performance of the aircraft. It is a comprehensive management system integrating signal management, task processing and flight management [4]. The advanced avionics system structure is based on the integrated avionics system structure, which adds the integrated management of sensors and operation platform. Avionics integration refers to the integration of detection, communication, navigation, identification, electronic warfare, task management, navigation, fire control, etc. inside the aircraft, which is the balance of system function, availability and production cycle cost.

4. Key technologies of Avionics Communication System

With the development of society, the electronic communication technology in our country has also been developed rapidly, and the application of electronic communication technology is more and more extensive. The development of mobile communication and satellite communication technology has a representative role, but at the same time, there are many problems. In the past, due to the increase of wireless spectrum resources, the use of wireless signal is becoming more and more inadequate. To meet people's needs, only the development of new communication technology can meet people's needs.

4.1 Key technologies of wireless communication system

The wireless communication system is divided into many small areas. Each area is composed of many wireless signal processing units. These units are far away from the carrier wave length. Each unit processes the transmitted signal at all times, and connects the units through the receiving, transmitting and other channels. This kind of communication is more convenient, but the structure is complex. Distributed wireless communication still has many advantages, such as weak mutual interference among units due to distance, internal structure to ensure its own performance and increase the capacity of the system, enhance the signal power, increase the service life, more effective use of wireless resources, convenient for maintenance and other advantages. Wireless communication system is composed of application layer, drive layer, transmission layer, data link layer and physical layer. The application layer is the core of the mobile communication system, and its main function is to manage the mobile communication system. The driving layer is to control all kinds of work instructions of each subsystem and monitor the subsystem. The transmission layer is responsible for controlling data transmission. The transmission layer deals with information processing, synchronous management, channel switching, etc. The data link layer controls and sorts the transmission sequences in information transmission.

4.2 Key technologies of satellite communication system

Satellite communication is the most advanced means of communication technology at present. It has a long communication distance and large capacity, and its quality and reliability are strong. With the
formation of global information and people's demand for information network, some key technical problems of electronic communication technology are also reflected. With the development of science and technology, people have corresponding countermeasures for the technical problems in satellite communication, Data compression technology can greatly improve the transmission time, frequency band, energy of the communication system, as well as some advanced technologies such as satellite laser communication technology. In the future, the data transmission of satellite communication mainly depends on the laser communication, because the laser transmission speed is fast, and the external influence is small. Therefore, the future communication technology should use laser as the carrier to transmit data. Electronic communication system is ubiquitous. The development of electronic communication system determines the comprehensive national strength and the ability to defend territory of a country. It is necessary to study and analyze the key technical issues in electronic communication and improve the deficiencies in communication system.

4.3 key technology analysis of Avionics Communication System

As the essence of aviation technology, avionics communication system is very important. The advanced level of avionics communication system reflects the strength of a country's national defense capability. The Military Avionics System (NASA equipment element is shown in Figure 2) uses 1553B as the bus to connect each unit, but the working purpose and conditions of each subsystem are different, which has high requirements on network layout, information transmission control and other aspects. Because the data requirements of the aircraft in the flight process are synchronous transmission and command release, which requires each subsystem The operation between the system and the total system is synchronous.

5. Conclusions

The electronic communication system of aviation equipment is a very complex network system. The key of technology development involves many fields. The design of electronic communication system will directly affect the information transmission of weapons and equipment. Good design can ensure the reliability of communication in the harsh electromagnetic environment of the battlefield and improve the efficiency of battlefield management. No "two blind, two deaf" army can win A high-tech war, the development of communication technology will affect the process and outcome of the war, and occupy an increasingly important position.

References

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