Study on the Application of Computer Technology in Radio and Television Wireless Relay Stations (Postprint)

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Date: 2023-10-08T00:00:00+00:00

Abstract

With the widespread adoption of network technology, contemporary computer technology has effectively advanced the processes of digitalization and informatization, thereby promoting industry development. In the current evolution of the broadcast television industry, technicians have begun integrating computer technology with television wireless transmission technology, which can enhance the quality of broadcast television transmission operations and program content. Simultaneously, it also optimizes the management quality of program transmission processes and facilitates technical optimization. This paper investigates the application of computer technology in broadcast television wireless transmission stations, aiming to advance the development of the modern broadcast television industry.

Full Text

Application of Computer Technology in Radio and Television Wireless Relay Stations

Abstract

With the popularization of network technology, computer technology has effectively advanced digitalization and informatization, driving industry development. In the radio and television sector, integrating computer technology with wireless relay technology can enhance both the quality of broadcasting relay operations and program content, while optimizing transmission management processes and facilitating technical improvements. This paper investigates the application of computer technology in radio and television wireless relay stations to promote the development of the modern radio and television industry.

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The widespread application of computer technology across various industries in China has effectively promoted their development. In the radio and television domain, it meets the demands of contemporary development, solves existing engineering challenges, and can effectively advance the modernization of the industry.

2. Application Analysis of Computer Technology in Radio and Television Engineering

Computer technology can enhance information transmission efficiency and range during relay processes, ensuring program transmission quality and preventing signal loss from affecting user experience.

2.1 Implementation of Network Broadcasting Technology

With the popularization of modern network technology, audiences have gradually reduced their reliance on traditional broadcast listening methods. Currently, many people use networks and mobile devices to access broadcast programs, which has impacted the traditional broadcast industry. Consequently, technicians have begun integrating network technology with broadcast programming by establishing dedicated broadcast servers online, enabling audiences to access programs via the internet. This implementation of network broadcasting technology effectively enhances user autonomy in program selection and listening, improves perceptions of traditional programming, and drives the modernization of broadcast programs.

1. Value of Applying Computer Technology in Radio and Television Engineering

With the popularization of networks and the extensive use of computer technology in various fields, people's lifestyles and work methods have undergone significant transformation, expanding their information horizons and reducing dependence on traditional radio and television for information acquisition. In the network era, information is easily accessible, and the quality demands for information have increased. In this environment, audiences have placed higher requirements on the information transmission processes of the radio and television industry, which disseminates large volumes and diverse types of information. In optimizing broadcasting relay processes, technicians believe that applying computer and network technology to program relay and production can effectively enhance transmission efficiency and quality, avoid potential signal loss during transmission, and improve viewing quality.

For radio and television engineering as a traditional medium, technicians need to address numerous technical challenges in the application of computer technology. Solving these problems can promote the modernization and improvement of

the radio and television industry. The main factors limiting the development of the radio and television industry include two aspects: the impact of new media on traditional media in the modern information age, and issues of information transmission quality. In future development, the use of computer technology in information transmission can increase program information transmission speed, and the multiple signal transmission modes of computer technology also meet current audience needs for information acquisition, reducing the impact of new media development on traditional media.

2.2 Automatic Inspection and Automatic Control Functions

During radio and television program production, computer monitoring technology can first perform real-time monitoring of parameters and values of signal transmission and broadcasting equipment, enabling automated inspection of transmitter operating status. When parameters deviate, the automatic control program in the computer reports the abnormal equipment conditions, facilitating timely technician intervention. The use of automatic inspection functions effectively reduces the impact of faulty parameters on program transmission processes and improves fault maintenance efficiency.

Furthermore, during radio and television signal transmission, technicians can use computer monitoring technology to detect signal sources and program broadcast processes, thereby achieving automated control and program frequency modulation. Signal transmission is often interrupted due to unexpected factors, affecting program viewing. Computer technology-enabled monitoring ensures rapid signal source switching to maintain normal program broadcasting. During signal transmission, computer monitoring systems can automatically control transmitter power switching; if the primary transmitter fails, the monitoring system can transfer signal transmission to backup equipment, preventing prolonged program interruptions and enhancing viewing quality.

2.3 Console Manual Operation

In the application of computer technology, console manual operation functions are primarily manifested in remote control, monitoring selection, signal surveillance, and signal control. For remote control functions, staff can use computer monitoring technology to monitor parameters such as operating voltage of signal transmission equipment to inform transmitter settings. In monitoring and signal surveillance tasks, technicians can implement these functions through computers in the console. During monitoring, if program signal transmission interruptions or signal source abnormalities are detected, staff can monitor signal sources and select appropriate available program sources to switch to the transmitter. During radio and television program signal transmission, computer technology enables technicians to monitor different aspects of transmission operations, ensuring signal source transmission quality. Simultaneously, during program signal modulation control processes, technicians can also use computer

technology to complete monitoring and ensure compliance with signal transmission technical requirements.

2.4 Voice Reporting Function

With the development of computer technology, current technology can implement voice reporting of signal transmission processes and transmission equipment operating status. The application of this technology is gradually becoming intelligent, effectively improving current radio and television program signal transmission quality. Voice reporting functions are now used in many radio and television program production and transmission processes. Compared to traditional automatic inspection and monitoring functions implemented through computer technology, voice reporting can directly announce equipment abnormal parameters and signal source faults via voice, greatly improving fault maintenance response efficiency and technician handling efficiency. The implementation of voice reporting functions effectively enhances staff fault maintenance efficiency and reduces work intensity. In actual signal transmission, computer monitoring technology can use voice reporting functions to report working status, ensuring normal signal transmission processes.

2.5 Post-production of Television Programs

High-quality television program post-production can improve program production quality and significantly enhance program composition and artistic value. Traditional television programs generally presented as single-segment performances, where transition preparations greatly affected program integrity and viewability. Therefore, in television program development, clipping of original single segments gradually emerged, with post-production editing becoming crucial for quality improvement. Early program editing relied primarily on manual work, with quality depending on editors' technical skills and experience; errors often required restarting production, resulting in low efficiency. After computer technology became widely applied, people began using computer software for television program post-production editing. Computer editing enables intuitive display of editing effects during work, while computer technology also allows timely correction of erroneous operations, improving editing efficiency and significantly enhancing the quality and efficiency of television program post-production.

The application of computer technology in program post-processing primarily involves using computer 3D production capabilities to improve program quality. In traditional program production, original materials often had defects; rational use of computer technology can improve the quality of poorly performing programs. After processing program deficiencies with computer special effects and enhancements, the quality of original television programs can be substantially improved. Additionally, program quality issues may arise from filming equipment or mistakes during shooting. Computer technology can add virtual effects to program video through processing and use post-processing software to resolve

shooting problems. Post-production editing and processing can reduce filming expenses, improve program production efficiency, and decrease production costs.

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Note: Figure translations are in progress. See original paper for figures.