Characteristics and Technical Maintenance Post-print of Hard Disk Playout Systems for County-level Television Stations

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Abstract

We know that the now widely used hard disk broadcast systems are causing the work of TV station program broadcasting to move towards digitalization and automation. The benefits of this approach include greatly reducing system maintenance costs while also decreasing staff labor intensity, thereby achieving the goal of resource sharing. Therefore, this paper systematically analyzes and introduces the characteristics of county-level TV station hard disk broadcast systems, as well as the measures that should be taken for their maintenance. It provides a brief discussion of these two aspects and the basic tutorial for hard disk broadcast systems, and offers recommendations for the operation of our TV station's hard disk broadcast system.

Full Text

Characteristics and Technical Maintenance of Hard Disk Broadcasting Systems in County-level TV Stations

Abstract: The widespread adoption of hard disk broadcasting systems has propelled television program broadcasting toward digitization and automation. This transition significantly reduces system maintenance costs and labor intensity while achieving resource sharing objectives. This paper systematically analyzes the characteristics of hard disk broadcasting systems in county-level TV stations and proposes corresponding maintenance measures to provide recommendations for their operation.

Keywords: County-level TV stations; Hard disk broadcasting system; Technical maintenance; Characteristics
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With the rapid development of network information technology, television program quality has gained higher assurance, and a novel broadcasting approach—the hard disk broadcasting system—has emerged. Utilizing hard disk systems for television program broadcasting substantially reduces resource consumption while delivering high efficiency, security, and reliability.

1. Current Status of County-level TV Station Hard Disk Broadcasting Systems

Currently, counties broadcast numerous television programs in large volumes, with daily output reaching, without exaggeration, nearly 24-hour continuous operation. Against this backdrop, TV stations must possess advanced broadcasting facilities. The broadcasting system represents a novel and sophisticated device that ensures effective daily operations. However, proper functioning requires regular maintenance, necessitating that technical personnel thoroughly understand the system's inherent characteristics and continuously enhance performance from both hardware and software perspectives. As the core component of television operations, broadcasting systems directly interface with audiences to disseminate information. China's rapid IT development has enabled the transition from traditional tape playback to hard disk broadcasting systems. Traditional video recorders suffer from poor reliability, high maintenance costs, and complex internal structures. Hard disk broadcasting systems compensate for these deficiencies, delivering clearer images and improving audience viewing experiences. Continuous maintenance and management during operation are essential for achieving high-efficiency performance. Therefore, studying the characteristics of hard disk broadcasting systems and their maintenance is critically important.

2. Inherent Characteristics of Hard Disk Broadcasting Systems

Hard disk broadcasting systems fundamentally possess three major characteristics:

2.1 Resource Sharing Capability

The resource sharing feature allows images and corresponding audio to be converted into digital signals and stored on hard disks, enabling effective rebroadcasting of single channels across multiple channels [1]. Essentially, resource sharing significantly enhances the utilization rate of reusable resources.

2.2 High Reliability and Efficiency

Broadcasting systems operate based on digital storage and processing. Once all television programs are pre-scheduled, the system can broadcast automatically according to the predetermined sequence without manual intervention throughout the process. This fundamentally saves substantial labor, avoids malfunctions associated with traditional tape-based broadcasting, and greatly improves system reliability.

2.3 Advanced Technology Integration

Television broadcasting systems are built upon networking and digitalization foundations. During actual program broadcasting, they rely on video and audio equipment, automatic playback systems, hard disks, and other devices [2] to achieve more convenient and efficient workflows.

3. Maintenance Measures for Hard Disk Broadcasting Systems

3.1 Providing a Suitable Operating Environment

Hardware broadcasting systems require a proper operating environment throughout their workflow, which forms the foundation for ensuring smooth operations. First, the machine room must maintain stable temperature and humidity levels. Excessive dryness generates static electricity that may damage the broadcasting system, while overly humid environments can corrode the hard disk system and cause electrical leakage. Additionally, dust and debris on desktops must be cleaned promptly, as water containers like teacups may cause equipment short circuits. No clutter should be placed on operation consoles, and equipment must be secured properly. Strong vibrations can scratch hard disk heads and prevent data reading, so equipment must be positioned appropriately. During daily operations, soft materials should be used to wipe dust from chassis and fans. Keyboards and mice often accumulate dust and can be cleaned with damp cloths and air-dried in ventilated areas. In summary, maintaining appropriate temperature and humidity in the machine room requires strict monitoring to keep conditions within reasonable ranges. Staff must adjust temperatures promptly when abnormalities occur to ensure normal system operation. Smoking must be prohibited in work areas.

3.2 Effective Backup of Computer Components

Broadcasting systems operate based on IT technology, and only stable computer systems can ensure safe and smooth program broadcasting, making this a critical factor. To guarantee reliable hardware operation, staff must backup motherboards, hard disks, and network cards. This ensures that hardware failures do not impact program broadcasting.

3.3 Effective Maintenance of Peripheral Equipment and Broadcasting Systems

During hard disk broadcasting operations, staff must carefully observe indicator lights, operational sounds, and corresponding prompts. When abnormalities are detected, fault locations must be diagnosed. Staff can power down the system to inspect and replace loose chassis components. Regular server restarts should be performed to enhance operational stability. Maintenance personnel should focus on checking oxidation and loosening at device connection points, replacing oxidized connectors and reinforcing loose areas [3]. When severely aged cables are discovered, they must be replaced with new ones. Technicians should use specialized instruments to detect various audio indicators and adjust broadcasting system parameters to reasonable ranges when abnormalities are found.

3.4 Ensuring Standardized Operations by Broadcasting Personnel

Hard disk broadcasting personnel must thoroughly familiarize themselves with the rules and regulations of the TV station's broadcasting system and perform their duties accordingly. During actual operations, staff must strictly follow prescribed sequences for powering equipment on and off. Forced shutdown by directly cutting power is prohibited, as this causes significant equipment damage. Staff must be supervised strictly to prevent non-standard operations that could lead to human-induced malfunctions.

3.5 Installing Authorized Software and Performing Disk Cleanup

Arbitrary software installation can lead to virus infections. TV stations should adopt uniformly regulated software and follow established procedures during installation. Unauthorized software, especially from unknown sources, must not be installed. Staff must regularly use disk cleanup tools to maintain and organize disks, deleting invalid files to further improve performance.

3.6 Strengthening Material Library Management

As TV stations are departments with numerous personnel, different staff members must be assigned distinct work accounts to prevent operational confusion and erroneous actions. Each staff member must work according to their permissions with clearly defined responsibilities and strict supervision. Staff must regularly check logs. The material library serves as the core of the playback system for storing materials [4]. TV stations must continuously emphasize material library management. Disk usage should not exceed 70% of total capacity to ensure adequate space. Unused materials should be organized and cleaned promptly, as excessive materials occupy space and affect search speed, thereby impacting broadcasting efficiency.

3.7 Regular Software System Upgrades and Timely Hidden Threat Removal

The hard disk systems responsible for program broadcasting in county-level TV stations cannot connect to external networks. Therefore, offline upgrade packages must be used to upgrade internal security protection software. Dedicated antivirus computers should be equipped with specialized disc burners to record data materials in disc format, avoiding Trojan virus attacks and ensuring stable operation of hard disk broadcasting systems.

4. Conclusion

In summary, the development of the times and social progress have brought TV station broadcasting systems into public focus. For broadcasting systems, effective maintenance of both hardware and software is required to ensure normal operation. TV stations are important carriers for national information dissemination, and smooth program broadcasting that achieves expected quality is a priority for all TV media professionals. Regardless of a TV station's size or audience coverage, safety during program broadcasting must be prioritized. Using hard disk systems for TV program broadcasting can effectively reduce resource consumption while delivering high efficiency, security, and reliability. Only through continuous practice, experience accumulation, and innovation can we ensure normal operation of hard disk broadcasting systems, achieve better broadcasting quality, and promote the development of the television media industry. Continuous updating of hard disk broadcasting systems is necessary to ensure smooth program broadcasting and broader audience coverage.

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