The Rise of Wireless Broadcast Transmission Solutions

Increasing competition for ratings and viewer engagement, the need to bring breaking news quickly, to go on the air from remote or unexpected places and provide unique shooting angles – all these have brought broadcast networks worldwide to extensively adopt wireless video transmission technologies.

More and more camera teams benefit from using wireless equipment to transmit video content from cameras back to Outside Broadcast Vans (OB Vans) or Central Stations.

Both professionals and amateurs use wireless solutions when they can’t use cables due to physical limitations at outdoor events, or simply for enhanced convenience. Also, movie and reality show teams increasingly adopt wireless solutions for content monitoring by the director. All appreciate the value of wireless solutions for attractive content transmission and ease of video shooting.

There is a variety of wireless technologies and solutions on the market today. This review of the different wireless technologies clarifies their suitability to broadcasting today and the appropriate use for each.

Wireless Broadcast Transmission Technologies

There are three leading wireless broadcast link technologies – each based on different a transmission method:

- OFDM/COFDM solutions
- Cellular network solutions
- Video over WiFi solutions

Each method has advantages and limitations, and may be combined with another method to achieve better coverage and resolve one system’s disadvantage.

OFDM Technology

OFDM is a method of encoding digital data on multiple carrier frequencies. OFDM/COFDM-based wireless video link systems consist of transmitters and receivers. The transmitter is positioned on the camera; the receiver is located inside the OB-Van or at the event’s media center where the content is gathered and transmitted forward. OFDM-based solutions usually provide very high picture quality, performance and range, as they are “stand-alone” and don’t rely on other networks or equipment. Their limitation is that they require additional equipment in order to transmit the broadcast content to viewers. These systems typically belong to the high-end broadcast quality level.

Video links over cellular networks

In wireless video links over cellular networks, the transmitter is positioned on the camera or in a backpack carried by the cameraman, transmitting the content over the cellular network, and from there to the broadcaster’s servers. The receiver is
Usually software on the server. Cellular systems often encounter congestion. In crowded events with many cell phone users, 3G & 4G networks may not provide the bandwidth required to maintain good image quality. Another typical problem is the high latency (up to 3 seconds) of the system.

**Video over Wi-Fi**

In Video over Wi-Fi systems, the transmitter is located on the camera and the receiver is either near the Wi-Fi access point in the same location, or at the TV station beyond the Internet cloud. The main advantage of Wi-Fi video link solutions is their low cost, making them a perfect choice for low-budget productions. Their disadvantages are compromised picture quality and stability, crowded frequencies, and the fact that they share resources with other applications and users. Combining two solutions can overcome some of these inherent technological limitations. For example, when employing OFDM in a congested cellular environment, the OFDM link can be used to “jump” the first few hundred meters away from the cellular congestion. This solution enables the cellular transmitter to connect to a clear cell, far away from the event, avoiding congestion and transmitting the broadcast live with minimal delay.

**ABonAir Wireless Broadcast Transmission Technology**

ABonAir’s wireless broadcast transmission solution utilizes a robust OFDM technology to deliver professional broadcast quality and to guarantee wireless coverage even in the most difficult scenarios. ABonAir innovative OFDM technology provides portable and high-quality video transmission systems for broadcast camera and production teams around the globe. This technology, combined with a proprietary over-the-air protocol, was designed to stream HD video, of the highest quality, with consistent bitrates in order to meet the most demanding broadcast standards.

Unlike high-end OFDM unidirectional systems, ABonAir’s OFDM system is built on a bidirectional link between transmitter and receiver. This allows the system to acknowledge acceptance of each pixel, thus guaranteeing zero errors, accurate pictures, stable transmission, and lower costs. In addition, the innovative H.264 video CODEC embedded in ABonAir’s systems ensures excellent picture quality and range. Our state-of-the-art video compression technology, along with wireless radio enhancements (extended range, security and quality), is ideal for broadcasting market needs and requirements.

The system’s unique algorithms are specifically designed to merge video and wireless technologies in order to deliver superior video quality, robustness, and stability. ABonAir’s technology is based on a full-duplex data channel that guarantees 100% availability. The system’s bi-directional link is embedded with features such as CCU, Tally and Intercom. It provides an excellent range up to 2.5 km as well as low delay and low power consumption. Thanks to its robust and reliable technology, ABonAir’s product-line has been successfully employed by broadcasters around the world.

**ABonAir’s technical advantages:**

- Robust and reliable OFDM wireless link
- Full duplex data channel (1 Mbps) for 100% availability
- H.264 CODEC – broadcast quality (42 dB PSNR)
- 2.5 km range
- Resolutions – SD/HD up to 1080p (NTSC/PAL)
- Low delay (90 msec)
- Embedded camera control unit (CCU)
- Unlicensed frequencies (4.9 Ghz-5.875 Ghz)
- Low power consumption (10 W)
- Automatic configuration for fast setup time

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