

Digital Video Technology...and the New XL System

What is digital video?

Digital video is simply an alternative means of transmitting a video signal from one place to another. An original composite or component analog video signal (television, camcorders, etc.) gets converted into a digital form—a high-speed stream of 1s and 0s, much the same way numbers are represented inside a computer—by an analog-to-digital converter (ADC) for storage, manipulation, or transmission. The signal is then converted back into an analog signal by a digital-to-analog converter (DAC) for viewing on an analog monitor.

Why use digital instead of analog?

Some analog signals are encoded and distributed over a single coaxial cable, while others are distributed over a series of cables. In each case, the process allows the signals to pick up interference. Digital technology keeps the signals free of interference; it is like CDs in audio—all background noise is gone. Digital signals can be copied and transformed many times without adding noise, distortion, or color and luminance (black and white) shifts. The signals are reliable and can work for year with little or no adjustment.

What are composite and component signals?

Composite signals are what we get in our homes. Luminance and color information are encoded together into a single signal and carried on a piece of coaxial cable. Component signals originate from a camera as red, green, and blue components, and are carried on three separate cables. Each signal is applicable to both analog and digital signals.

Can component signals be converted into composite signals?

Yes. Television signals originating with the studio camera and terminating on a home TV are encoded and then decoded in this manner. However, the process causes interference in the picture and it should be avoided. Impairments are kept to a minimum if signals remain in a composite or component format throughout the conversion process.

What part will digital video play in the new XL System?

In the XL System's Phase 1 and Phase 2 development, audio and video signals will continue to be transmitted in the analog format, much the same way they have been transmitted over the company's present system. In Phase 3, however, the new system will be capable of recording, storing, and transferring digital media. Phase 3 fully implements the XL System's design vision of using digital-capable local audio booths (Phase 2 addition) and video studios for our reporting purposes. Recordings will be stored in a new media server until transmitted to a specific XL STAR.

Will digital video create transmission and computer storage problems for the company and its affiliates?

One of the biggest challenges posed by digital video is the volume of data involved and how it bears on storage, transmission, and display. The XL System's digital video signal will be encoded (compressed) into a "bit stream" using the MPEG compression standard to fit the data inside existing transmission "pipelines," broadband networks, and storage servers.

What is the MPEG compression standard?

MPEG is a world standard for digital video compression established by the International Standards Organization's *Moving Picture Expert Group*. MPEG encoding uses complex algorithms to discard unnecessary data within a video stream. It can reduce the data stream by as much as 99 percent, although it is not a simple process. The data loss created by simple MPEG compression can result in low-quality images and unsynchronized audio and video. Beyond the complex hardware and software, it takes a trained professional knowledgeable in video production and an artist's eye for color, mood, and impact to ensure quality images.