

# Frequently Asked Questions

## **What can the camera do better than present cameras, generally?**

Before implementation of DTV-HDTV the standard, known as NTSC, evolved over 70 years first in analog form and later as a digital representation 601D. The only significant change had been the addition of color in the late 50's. The format is 720H X 483V interlaced alternate video lines @ 30 frames per second. The video came off of the CCD as alternating Fields consisting of 175,000 pixels per Field. The initial HDTV standards approved for commercial and military applications include a format that is 1280H X 720V progressive Frames @ various speeds up to 60Hz (720p). That's 921,600 pixels per Frame. Frames all for the full representation of the captured image similar to a frame of 35mm film.

This technique when run at speed greatly reduces motion blur.

## **What is the difference between interlaced and progressive?**

Progressive formats represent the most advanced digital video technology available. Progressive scanning (used in all computer monitors including flat panel displays) "paints" every line of the picture sequentially every time the screen is scanned. It takes only 1/60th of a second to scan one complete picture. By contrast, interlace scanning, invented at the inception of Television Broadcasting in the late 1930's, first paints the odd numbered lines every time the picture is scanned, followed by the even lines.

With interlaced formats, any horizontal motion in the original source between frames results in blurring. Similarly vertical motion results in flicker (the "venetian blind" effect). These defects are eliminated in progressive scanned systems.

## **Is 720p "real" HDTV?**

The Consumer Electronics Manufacturers Association (CEMA) and the Advanced Television Standards Committee (ATSC) established the standards for digital television and defined HDTV to include 720P; subsequently 1080p was added to the official HDTV standards for production and display of motion video in the entertainment industry

## **How would it sync with face identification systems?**

Liberty suggests that all current commercial systems will undergo upgrading to massively improve recognition software. In the process new federal standards will include computer compatible progressive scan video.

## **Why would it be better for airport surveillance?**

Most automated surveillance systems rely on computerized matching of the video with information of target persons in a database. When the data matches to some degree of confidence a target person has been found. Under the current plan the FAA, with help from the FBI, will establish standards for airport security. Because they will have to work closely with other government agencies like the CIA and NSA, the formats must be compatible with the target images in their databases. DoD has tested and approved the 1280 x 720 and the 1920 X 1080 formats; the tedious standards work on the capture formats has been done. Liberty has a tremendous advantage to address the video surveillance markets. As a Society of Motion Picture and Television Engineers member Liberty has been involved in the development of HDTV standards since 1990 for both commercial and military applications.

## **Would Liberty's technology be superior for military surveillance?**

Yes, it is highly desirable for video in support of military intelligence activities. For example, the Predator (the Unmanned Aerial Vehicle developed by DARPA) has extensive imaging capability. Other

military systems could use Liberty's technology. For example, submarine periscopes could benefit from the small size, high resolution, and electronic flexibility afforded by Liberty's cameras. Many soldiers wounded in combat must be diagnosed and treated during the first hour after they are injured or their chances of recovery are poor. In fact, the percentage of wounded who survive this "Golden Hour" has not changed since the Civil War, partly because it is so difficult to get good diagnostic information on the battlefield. Remote battlefield imaging of medical traumas could benefit from the small size, low power consumption, and digital output from Liberty's camera technology.

**What potential uses are there for digital video in broadband Internet, telecommunications, video conferencing, and video on demand?**

Any video conferencing system will benefit from three attributes of this technology: Progressive scanning format, an all-digital architecture, and programmability. Progressive scan is important because the output from the camera is inherently computer compatible. Furthermore, the output can be more efficiently compressed than interlaced formats. Digital camera architectures have advantages because it can take advantage of the integrated circuit manufacturing methods to permit lower-cost cameras than their analog counterparts. Programmability allows us to address the sensor and instruct it to perform different functions such as moving the field of view, altering the scan rate, and changing the output format.

Liberty's cameras can easily be adapted for video conferencing. The digital programmability permits an implementation of a standard, 480p, often used for video conferencing systems. This standard is not in wide use, but is absolutely perfect for smaller screens (40- to 50-inch diagonal) commonly used in video conferencing situations.

Texas Instrument's DLP digital projectors for theatrcall exabition are an ideal compliment to Liberty's camera since both can project either 720p or 480p formats and new version are rapidly transitioning to the more advanced 1080p format. Expectations are that starting in 2013 US movie theaters will become 100% digital exhibition venues of entertainment.