**Progressive vs Interlaced**

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**Interlaced** video has been around as long as there have been televisions with cathode ray tubes (CRTs). All analog television standards are based on **interlaced** video, and we're so used to it that it's not something that we typically think about. High definition video can be either **interlaced** or progressively scanned. It's important to understand these terms, and it's really not too difficult.

**Progressive** scan video is scanned from side to side, top to bottom: line 1, line 2, line 3 etc, up to the end of the frame. It's as simple as that. In fact, it's exactly how you'd expect video to be scanned if you didn't know any better!

**Interlaced** video is scanned from side to side, top to bottom, as well. The difference is that every 60th of a second, every other line making up the complete frame is scanned. Then, a 60th of a second later, the lines in-between the lines that have already appeared are scanned. Effectively, half the picture's vertical resolution is sent in the first 60th of a second, and the second half is sent in the second 60th of a second. When the video is played back, the whole thing happens in reverse, giving the appearance of a complete frame. Each of these "halves" of a frame is called a "field."  
  
The effect to the viewer is quite distinct. First, the image doesn't flicker as much as it would if it was a simple 30 FPS **progressive** scan. This is because, to the viewer, it looks as if they are seeing 60 frames per second. Of course, what they are actually seeing is 60 fields per second; but for flicker reduction, the effect is the same as seeing 60 frames.  
  
If you were to look at an **interlaced** picture on a screen for a 60th of a second, you'd only see half the vertical resolution — every other line. But, because our eyes and brains conveniently offer a "persistence" effect, when you look at the screen "normally," what you actually see is something approaching full resolution. Persistence allows us to accumulate visual data from the two distinct fields, making them seem like one complete image.

720p and 1080i  
Progressively scanned high definition video tends to have a resolution of 1280 by 720 pixels, normally referred to as "720p", where the "p" stands for **progressive**. Likewise, “1080i” is **interlaced** video with a frame size of 1920 by 1080 pixels. Interlacing is actually a form of compression. Offsetting the two fields making up a frame by half a frame's duration, halves the total amount of information needed to transmit or store the video. Uncompressed **interlaced** high definition video generates around a gigabit per second. Without interlacing, the rate would be twice that.

24p

There is a special case of **progressive** scanning, known as 24p. Twenty-four frames per second sounds very slow, but it's used by some video systems to mimic the frame rate of film. HDV doesn't support 24p directly, but some cameras can emulate it using a technique called "pulldown." Pulldown converts a lower sampled framerate to a higher framerate for display by repeating fields from adjacent frames. Camcorders that emulate 24p take samples at 24 fps, then apply pulldown to produce **interlaced** 30 fps video to be HDV-compliant.Thus there's really only 24 frames-per-second of distinct information, but the stored video is standard 29.97 frames-per-second **interlaced** data.

Disadvantages of **Interlaced** and **Progressive**  
**Interlaced** video does have some disadvantages in comparison with **progressive**. It's prone to causing "artifacts", which look like a kind of "comb" effect, especially in slow motion or in still grabs from moving video. They are caused by the relative movement between two fields that make up a single frame. It's a fact of life, though, that 1080p, (1920 by 1080 **progressive**), which might appear to be the perfect format for high definition video, would generate too much data for current consumer technology, so we might have to wait a while for that. Rest assured that your Canopus technology, which is completely resolution independent, will be able to handle it, if it ever does appear