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Innovations Affecting Us — What's the Fuss About Digital Video?

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Please note — We are looking for a second column editor for Innovations Affecting Us. If any of you out there are interested, please contact Katina <strauchk@cofc.edu> or Norm <normd@providence.edu>.— KS

American broadcasters plan to begin transmitting digital television signals before the end of 1998. Consumers have been able to purchase digital video players (DVD) since March, 1997 to hook up to their television sets or computers to view pre-recorded movies. But, so far, there have not been many titles available in this format, mostly because movie producers fear copyright infringement and the loss of control that could result from digital copying. Yet, DVD "experienced better sales performance in its first year than either color TV or the CD format" (1998 *U.S. Consumer Electronics Industry Today*. p.3).

Digital video does for the video industry what the CD did for the audio industry. It provides high quality, full-screen, full-motion video with CD quality audio in real time without any pauses. The DVD specification calls for a minimum resolution of 720 pixels x 480 lines. This produces a sharper picture than is possible from a laserdisc and one far better than VHS videotape's 300 lines of resolution.

The film and television industries will use the same digital video codes for their digital signal when they begin digital broadcasts as DVD currently uses. This will make digital video universally compatible and make it much easier to trade bits among video, DVD, and World Wide Web pictures. Product developers will face an increasing demand for high quality video sequences. Developers and end users will also find a variety of uses for digital stock video footage as they did for digital clip art images. In fact, digital video may become the clip art of the future.

Artbeats Software, Inc., a developer and publisher of digital stock footage, plans to release a collection of stock footage clips designed for the high definition broadcasts of digital video. They recently released a product called "White Puffy Clouds HD" which consists of five CDs with seven clips taken from their Digital Film Library. Each disc contains one or two clips which run from 14 to 20 seconds.

Artbeats scanned the 35mm film at 2K resolution (2048 x 1536), then optimized it for a high definition frame size of 1920 x 1080 pixels. The frame rate is 30 fps (frames per second) "progressive." This means that each frame of an image shows the entire picture, instead of half of it as in an interlaced scan, such as on television and VHS videotape, which shows odd lines in one frame and even ones in the next frame.

These clips will not be box office blockbusters. They just show clouds moving over the sky at various speeds under variable weather conditions. What makes these clips astounding is that they consist of only three colors: blue, white, and gray. Anybody who has worked with or viewed digital images on a PC can attest to the high degree of pixellation and distortion that usually results from pictures of this type. That is because the limited palette available in most programs cannot display the infinite gradation of color demanded by images with few colors, such as a solid background, the sky, or the ocean.

The CDs include each clip in two versions: high definition and preview. Both use JPEG compression and play under QuickTime. The high definition version extends beyond the boundaries of a monitor at 1024 x 768 resolution and will probably be jerky. That was the case

using a 24X CD-ROM drive on a Pentium 266 with a 2 MB video card. QuickTime skipped many frames; but the few that it did show had stunning sharpness and high quality color gradation. Best reproduction would require a DVD player.

The preview version plays in a window at 640 x 480 resolution. Viewers can expand the window to cover the full screen. The high quality of the scanning and color resolution produce realistic images with no pixellation or distortion, even when freezing a frame or stepping from one frame to another.

These clips require lots of space, as can be imagined. File sizes range from 261 MB to 500 MB. Oddly enough, the file sizes do not correspond to the length of the clip but rather to the color variation and the amount of color redundancy that can be compressed. For example, both the largest and the smallest clips last 20 seconds. The shortest clip (14:06 seconds), on the other hand, is the second largest (458 MB) in size. Also, there does not seem to be any correlation between the file sizes of the two versions. The smallest clip in the high definition version is the largest in the preview version (10 MB), while the shortest clip (14:06 seconds) is the second largest (458 MB) in the high definition version but the smallest in the preview version.

Artbeats will also release a third title in its **ReelExplosions** series. This package will contain larger scale explosions than its previous titles. It will use a high speed 35mm camera at 360 frames per second for a longer lasting effect. **Phil Bates**, president of the company said, "Public response to the first two ReelExplosions titles was so overwhelmingly positive that we felt we had to do another volume. Many of these have a different look than our previous packages and contain debris, which is something we've had a large number of requests for."

The title will be available in three different resolutions for a wide variety of possible uses. Frame sizes and rates will have a basic resolution of 720 x 486 at 30 fps for NTSC or 720 x 576 at 25 fps for PAL. It will have a 1K version (1024 x 768) for users who need to zoom in on an effect or to give greater flexibility in the positioning of an effect within a typical broadcast frame. There will also be a 2 K (2048 x 1536) version for film use. As in previous collections, many of the explosion clips will have corresponding mattes for keying.

The clips will be in QuickTime format and use the PhotoJPEG compression codec (compression/decompression algorithm). PhotoJPEG compression permits creating clips whose quality is virtually indistinguishable from uncompressed files but whose file size remains small enough for convenient delivery on CD-ROM. The product also includes a QuickTime to Targa conversion utility for Windows users. The publisher may also release Targa versions if demand warrants.

Artbeats has not set a price for the White Puffy Clouds collection. ReelExplosions 3 has a retail price of \$499.00. Both products are royalty free with network and site licenses available. For more information, contact Artbeats Software by phone at (541) 863-4429, fax at (541) 863-4547, or email to facts@artbeats.com or visit their Website at: <http://www.artbeats.com>.

High definition digital video will soon be cropping up everywhere. It will likely replace the low quality video formats currently available. Demand for high quality stock video footage may surpass that for clip art images for use with word processors, greeting card programs, and other application packages. 