

## FOCUSING ON THE COMPRESSION CONCATENATION ROAD TO HD

**W**hen a feature, television show or even a 30 second commercial is mastered in HD there is the expectation by some producers that the image will stay exquisitely pristine, uncompressed, and high quality all the way through the delivery chain until it shows up at a viewer's house on their HD television in all its exquisitely pristine, uncompressed, high quality glory.

Nothing can be further from the truth.

In fact, there is ample evidence that the image will suffer more than just a slightly detectable amount of compression and bandwidth limitation due to most cable company delivery and satellite transmission methods. Recently, Comcast has admitted that it regularly compresses up to three HD channels into the space allotted to a single 6 Mhz analog channel. This is done simply because there is not enough bandwidth to accommodate all the HD channels viewers demand. Even DirecTV and Dish are resorting to a more efficient yet highly compressed 11 Mbps MPEG 4 codec to squeeze even more HD channels on the limited number of satellite transponders available. This is a far cry from the 880 Mbps or even the relatively "low" 440 Mbps that HDCAM SR records at when shooting and mastering a feature film or commercial. This ultimately begs the question, "what's the point of shooting and editing on a high-quality (and expensive) format such as HDCAM SR when it appears that mastering on HDV (at a modest 25 Mbps) will outperform most HD delivery systems?"

It all has to do with compression, concatenation and the compounding of artifacts as the image is recorded, edited, routed, transmitted and processed for viewer consumption. A camcorder—whether it is HDV, Varicam or HDCAM SR—uses its own compression system to record the image in HD. Then at each step of the post production and distribution, the image has to be ingested, then converted (and compressed). This is done from the point of editing all the way to delivery and broadcast from a network. In addition, the HD image is also affected by luma and chroma filtering that goes on in each HD recording system. For example, if you record on Varicam (1280 lines of luma and 640 chroma) then master onto HDCAM (1440-luma and 480-chroma), you wind up with an image that has been upscaled to 1920x1080, but the actual resolution is 1280 luma and 480 chroma. The luma to chroma resolution issue is even worse in HDV, since the luminance and chroma is encoded at 4:2:0 sampling instead of 4:2:2.

True, HDV has 25 Mbps versus DTV's maximum HD bandwidth of 19.4 Mbps, so logically it sounds like HDV has bits to spare if broadcasting over DTV. Unfortunately, this logic does not take into consideration the necessity to convert HDV's MPEG 4 to DTV's MPEG 2. Consider HDV's severe artifacting problem, especially when dealing with fast moving objects that change color or luminance values rapidly—when examined carefully frame by frame, it is truly a mess of macroblocking and detail loss that looks like anything but pristine HD. It is not possible to broadcast directly from an HDV tape—it needs to be converted into 1080i or 720P HDSDI for a network to use it for broadcast (this does not magically erase the compression artifacts inherent in the HDV, it just makes them more visible to broadcasting engineers). Now, take that HDSDI image that was originally 25 Mbps (with all the compression artifacts still in the image) and compress it even further into the 19.4 Mbps MPEG 2 DTV codec and you will see even more compression artifacts from DTV on top of the original compression artifacts that were recorded from the HDV. You will see how much that HDV signal has degraded to something not even approaching standard definition in color space and detail. At this point, we suspect that you don't even want to think about what the image will look like after satellite and cable providers acquire, encode and re-broadcast it.

What is a producer to do? For one thing, don't start out using a lossy format such as HDV, (the problems of which are revealed in greater detail in our Summer'07 newsletter). To put it in perspective, HDV is the cocktail ice cube to HDCAM SR's 40 pound block of ice, and typical compression concatenation is like traveling on foot thru the Mojave desert—in summer. How good the final product will look will depend on whether you can sell a nice block of ice or an evaporating puddle of water to a viewer thirsting for HD programming.

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### CATCH 21, THE SINGING OFFICE AND THE ACADEMY

Scott Sternberg Productions has chosen FILMLOOK Inc. for final online for three of its series, Catch 21 for GSN, The Singing Office for TLC and the second season of The Academy for Fox Reality. The multi camera series are edited in Final Cut Pro then brought to FILMLOOK either as files or tapes then onlined for broadcast.

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### INTO THE UNKNOWN

Natural 9 has brought the series "Into the Unknown with George Nori" to FILMLOOK for film simulation and color correction for SciFi. "Into the Unknown" is a talk show examining the unusual and paranormal such as UFOs, vampires and Bigfoot. The interviews are done multicamera style then brought to FILMLOOK Inc.'s FILMLOOK®/da vinci 2K system prior to airing on the SciFi channel.

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### SCARE TACTICS

Hallock Healey is producing its third season of the popular series "Scare Tactics" for SciFi, this time using FILMLOOK Inc.'s film simulation and da vinci 2K suite prior to airing. The series sets up elaborate and often terrifying pranks on unsuspecting victims, all recorded on hidden camera. The series is brought to the FILMLOOK®/da vinci 2K suite for film simulation and color timing prior to airing on SciFi.

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### ULTIMATE WARRIOR

Morningstar Entertainment has produced the pilot "Deadliest Warriors" for Spike TV, a reality series shot on HDCAM then brought to FILMLOOK Inc. for final da vinci 2K color timing. The series examines two legendary warriors (such as a ninja and a Spartan), examining and demonstrating their weapons by inflicting injury on test dummies and re-creating each warrior's training methods. Then, using historians, scientists and modern day military experts as consultants, computer simulations are run of the theoretical warriors doing battle, based on the measurable data. FILMLOOK Inc. was called upon to provide da vinci 2K color timing of the HD pilot.

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### HALFORD'S LOST CONCERT

Judas Priest frontman Rob Halford's "lost" Rio de Janeiro concert has recently surfaced, and FILMLOOK Inc. was used for final color correction and FILMLOOK processing. The concert also features never before seen interview footage of Rob Halford and his bandmates. The full-length feature documentary, shot in video and color timed and FILMLOOK processed, will be offered as part of a Halford music package to be offered this fall.

*If you have a news item for the FILMLOOK Newsletter,  
please email us at [anna@filmlook.com](mailto:anna@filmlook.com) and it will be included in our next issue.*