

Is That Video “Uncompressed?”

Just because it says uncompressed, doesn't necessarily mean it's true

■ By C.R. Caillouet



The detail area of the flower shows an uncompressed image and a corresponding one that has been digitally compressed and decompressed. It's a JPEG compression, similar to the techniques used in HD production cameras. Look for softening or blocks in smooth areas.

In the last issue, we talked about the digitization of analog signals and the reconstruction of digital ones. I also mentioned that one might make assumptions about the use of an image (or video clip) and then throw away unnecessary information to reduce the amount of data. In the caption for the picture, I asked if both images were perfect.

In fact, both images contained exactly the same amount of data. They were the same size and had the same number of pixels per inch. Thus, they contained the same number of bits per pixel. But the one that was scaled to $\frac{1}{16}$, then reconstituted, obviously contained less information than the original—and that leads us to one of most confusing terms in digital video: uncompressed.

When we capture images with a camera, we perform several operations that reduce the amount of infor-

mation from the original scene to form a digital representation. At some point, we declare the image uncompressed, or as good as we can get in the digital format.

Often, an uncompressed image has already been compromised in resolution and dynamic range, and it has obviously been sampled and quantized, so the smallest details have been averaged together to make numerically represented “pixels,” or picture elements. Those pixels are now the smallest elements of the image.

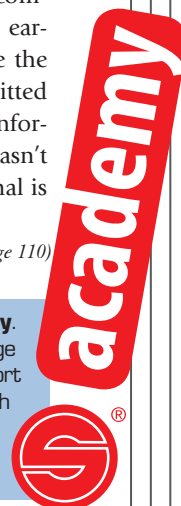
We may do any number of things to a stream of images in order to record, process or transmit it, and we

may discard information to make those things practical. But at some points along the way, we'll need to convert our material back into a usable form for display.

That form is likely to be the same image format as the one in which the original material was captured. The data may look just like that uncompressed signal that we identified earlier and the scene may resemble the original—but we already admitted that we discarded some of the information because we decided it wasn't needed. So the reconstituted signal is no longer uncompressed at all.

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“Misinformation” is a joint effort between *HDVideoPro* and the **Sachtler Academy**. The **Sachtler Academy** is dedicated to promoting open knowledge exchange among production professionals worldwide. Initiated by renowned camera support manufacturer Sachtler, the Academy offers a nonpartisan venue by which cinematographers and videographers can hone their talents, discuss techniques and stay updated on technical advances from various manufacturers. To find out more, visit www.sachtler-academy.com/ and www.sachtler.us.



MISINFORMATION

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How badly scuffed they are depends on how harshly I compressed the data. They may range from “mildly jostled” to “brutally hammered.” No, those aren’t technical terms, but represent the range of damage that can be done by compression operations.

The nature of the compression and the depth of the data-rate reduction determine whether the damage is barely noticeable or renders the material unusable for a specific application.

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In the case of “intraframe compression” (where only information within each frame is used), resolution, color and dynamic range may be compromised.

Once the jump is made to “interframe compression” (when frames before and after the current frame are compared for changes), independent images may be compromised and effectively blended with adjacent frames to further reduce the data and motion reproduction may suffer.

So even though the displayed signal may meet all the technical specifications of the original one, decompressed video content may be a far cry from that uncompressed scene representation. HDVP