

Seeing RED

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How Artbeats is using the RED One camera to create high-resolution clips for its stock footage library.

The RED One digital video camera has captured the imagination of many videographers and filmmakers. It provides film resolution in a digital format at a price point that is cost effective compared to film and other high-end digital video cameras. The RED One also captured the imagination of the folks at Artbeats. They already used film as well as high-end digital video cameras to capture source material for their stock footage library; the RED looked like an intriguing alternative. Therefore, they ordered a RED One camera in January 2007.

After a long wait plus extensive work in the field as well as in the studio, Artbeats is now releasing their first RED-originated stock footage clips. In addition to offering the resulting clips in the normal high definition, standard definition, and web resolution clips, Artbeats is also releasing 2k, 3k and 4k (4096 pixel-wide) versions of the clips depending how they were captured, in both color-corrected and full dynamic range "camera raw" variations. Phil Bates – president and founder of Artbeats, who is still very much hands-on when it comes to their technology as well as their footage shoots – shared with us some of the details behind their transition to the RED.

Why RED?

One of the reasons we're personally such big fans of Artbeats stock footage is their attention to quality. They've shot on film since their earliest days, while many others were still using standard definition video cameras. As technology has evolved, they've moved between different film scanning techniques, bought their own Sony CineAlta F900R digital high definition video camera, and used Canon 20D and 40D digital SLR cameras to capture timelapse footage.

However, these formats have limitations. Shooting film is both expensive and time-consuming, limiting

spontaneity and how many set-ups can be shot cost-effectively at a given location. On the other hand, the F900R is very convenient to shoot with, but it has limited frame rate flexibility, its resolution is limited to the HD frame, and the image it captures can be compromised by a limited dynamic range (leading to posterization when shooting bright images or light sources) and "ringing" (problems with high-contrast edges).

RED Detail



CineAlta Detail



Figure 1: When zooming in on a frame shot in HD with the Sony F900R, details can appear noisy with some "ringing" around the edges, while details in a frame shot at high resolution with the RED One remain relatively clean and sharp. The result is cleaner stock footage that can withstand more processing for a variety of uses.

RED Example 4K



CineAlta Example



By contrast, the RED One can shoot a higher resolution image than the F900R and other HD video cameras. Indeed, Artbeats shot their RED footage at 2k, 3k, and 4k image sizes (typical of scanned film), with an image aspect ratio of 2:1 – for example, 4096 x 2048 pixels. This allows the captured image to be panned, tilted, stabilized, and re-framed after the fact while still having more than enough pixels left over for a final high-def frame. The RED One also has good frame rate flexibility, shooting up to 60 fps at 3k resolution and 120 fps at 2k resolution.

Perhaps of most interest is the dynamic range of the RED, and how it uses it. In terms of objective measurement, the RED offers about 9 to 11 F-stops of dynamic range, which is on par with other high-end digital video cameras. Where it differs is how it subjectively handles the extremes of this range. In Artbeats' experience, rather than just abruptly clipping on bright images such as sunsets (which can lead to color shifts), the RED has a gentler roll-off into clipping, which yields fewer visual artifacts and a more film-like response.

The other main difference is the RED's ability to capture a "raw" image akin to high-end digital still image cameras. Video cameras take the information from their sensors, translate it to a range-video signal, and freeze the result on tape. A "raw" image maintains all of the information available at the sensor, allowing you to decide later how to translate it into the final image. This gives you much more flexibility in color correction, as well as solving problems with overexposure or crushed shadows: Rather than working with an already-altered signal, you can go back to the original source and work around potential problems or make creative adjustments after the fact. This is another way that working with RED footage is more like working with scanned film.

Hardware Issues

After a 15-month wait, Artbeats took delivery of RED One number 1168 in April 2008. In addition to the camera itself, they also purchased a fairly standard equipment package plus lots of spare batteries (they often shoot remotely or from the air, meaning a charger is rarely at hand) as well as both Compact Flash cards (less weight) and Red drives (more capacity) to use depending on a particular shoot's requirements. In addition, they acquired a Macintosh 17" laptop as well as a number of extra drives to download and back up newly-acquired footage while on a shoot.



Figure 2: The RED One being put to use on location in Wyoming.

One of the biggest choices a videographer has to make when it comes to using the RED concerns which lenses to use. The RED One comes with a PL-style mount, which is common for production cinema-quality lenses. However, these lenses are very expensive. You can rent PL lenses, and RED themselves are developing their own series of cost-effective PL-mount lenses, but in the meantime Artbeats needed access now to a wide array of lenses they could pick up and shoot with spontaneously. As a result, Artbeats had their RED One changed over from a PL to a Nikon mount, and purchased a full set of Nikon professional still image lenses ranging in focal length from 17mm to 400mm. They supplemented this with a Peleng fisheye lens for extra-wide angle shots. Artbeats also purchased a B4 mount so that they could use their Fujinon ENG (Electronic News Gathering) lenses that they bought for their F900R, but those lenses were designed for a smaller image sensor, limiting their RED resolution to 2k (2048 pixels across). The Nikon lenses allow them to shoot at full 4k resolution.

The Nikon photography lenses are very high in quality, and significantly cheaper than PL lenses. On the downside, they lack the gearing and extended zoom range needed for rack focus and follow focus effects. Fortunately, this has proven to be only a minor limitation for Artbeats, as most of their initial subjects have been nature scenes that are either locked down or have simple pans and tilts. However, they are planning to go back to the traditional PL mount once RED has fleshed out their line of PL lenses and they become more readily available.

Once a RED is fully outfitted with lenses, drive, and monitoring, it can become rather bulky compared to a more portable ENG-style camera such as the Sony F900R. Add in lens changeovers as well as the current minute-plus it takes a RED One to boot up (advanced digital cameras are as much about software as hardware these days), and some spontaneity is indeed lost with the RED One compared to using other digital cameras, but the upside is film-like image quality and flexibility.

Workflow

Using the RED One has required some changes in the workflow Artbeats normally goes through to convert captured images into finished stock footage. Once again, the resulting workflow is more similar to that of film than working with other digital video cameras. After transferring the captures to a local hard drive in the field and then the server farm back at Artbeats' office, low-resolution proxies of the original shots were viewed to make selects. The full-frame raw versions of the selects were color corrected in a beta version of the application Red Alert, then batch-converted to DPX files (a common digital film scan format with extended dynamic range) using Red Rushes. The combination of the large raw source files plus the color-corrected DPX versions has ended up consuming a large amount of their network storage.

The DPX files were then imported into After Effects, using template projects Artbeats has already set up ahead of time. Inside After Effects, a given shot may undergo additional color correction, image stabilization, time stretching, frame blending, rotoscoping to remove artifacts and unwanted elements such as telephone poles and the such, and in some cases zooming and reframing (an advantage of shooting such large source frames).

The aforementioned After Effects templates include multiple output modules which allowed full-size (usually 4k or 3k) results to be rendered as PhotoJPEG-encoded QuickTime movies, as well as the ability to create high-def, standard definition, and low resolution "web" versions from the same master composition.

RED has announced a solution to import their RAW files directly into Adobe applications such as After Effects, but Artbeats is not yet using this approach. They look forward to switching over to this workflow in the future, as it should remove some steps from their workflow including the need to store redundant DPX versions of the clips.

Zooming Out

Artbeats released the first of their RED One footage on October 21. In this initial release, shots are available as individual clips in the original source size (2k, 3k, or 4k) in either 2:1 or 16:9 image aspect ratios depending on the clip, as well as normal high-def and standard-def sizes plus 480 pixel wide "web" (low-res) versions. Prices range from \$399 for the 4k or 3k clips to \$79 for the low-res clips.



Figure 3: The screen capture below illustrates the color correction capabilities of RedAlert. Clip A002-C134 shown.

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Chris and Trish Meyer are the founders and owners of CyberMotion (www.cybmotion.com), an award-winning motion graphics studio in Los Angeles that has created a wide variety of work for film, broadcast, corporate events, and special venues. They were one of the original development sites for After Effects, wrote the highly-acclaimed books *Creating Motion Graphics* and *After Effects Apprentice* (2007), and are long-time Artbeats users.