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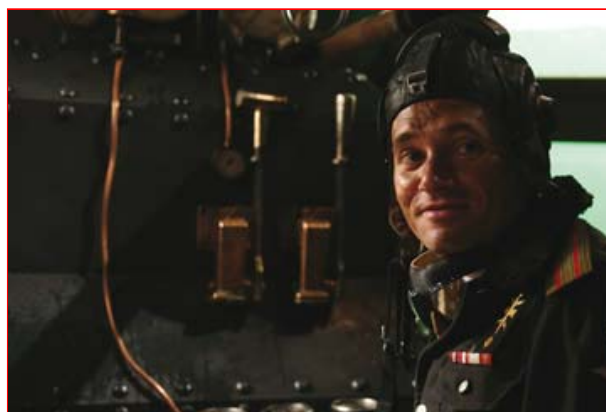
# Chronicling Mutants

**Geoff Boyle reports on his initial experiences as cinematographer on VFX-laden movie *Mutant Chronicles*, shooting *Grass Valley Viper* to *S.Twos*.**

Article first published: September/October 2006



**Geoff Boyle takes a light reading.**



**Director Simon Hunter makes a cameo appearance.**

So, I've finally shot a movie – well, the first part of it, anyway; models and 2nd unit are still to come. And after more than 20 years of shooting commercials on film, my first movie has been shot digitally.

It's been a strange experience for me. Normally when I get interviewed with the possibility of shooting a film, I get down to the last two DPs and then get rejected because I'm a 'commercials' cameraman and will be too slow as a result. This process takes months.

This time I had my first meeting with Simon Hunter, the director, and Tim Dennison and Peter Le Terriere, the producers, in a coffee bar near their office in Marylebone. Simon was very interested in what I knew and felt about digital and we talked about the look he wanted. I dragged out my laptop and loaded SpeedGrade and then tried altering the look of some images. Of course, it was in maximum power saving, so was as slow as hell and I looked a klutz, but it worked and showed that we understood each other's ideas about the look. Of course, I'd made up a special DVD showreel for the meeting that had a very sci-fi look, but the first thing Simon said was, "I don't want that typical hard blue backlight look that all SF films have." Whoops! I said I wouldn't bother leaving the DVD, as it was all – well, hard blue backlight. But Simon said he wanted to see it anyway.

We followed up with a second meeting in their Shepperton offices a couple of weeks later and after what seemed like a great meeting Peter brought up the commercials thing. Uh-oh, I thought, here we go again.

I'd talked to Greg, my agent, that morning, and had been very negative about the meeting, saying, "here we go again, another waste of time." Five hours each way from Devon. He screamed at me, told me not to bother going. Told me it was a waste of time going with that attitude: I had to go knowing that I was the one. So I did. I told Greg that I had enjoyed the meeting and that I thought I would enjoy working with Simon, but that it wouldn't go anywhere for the usual reason. A week or so later I got a call from Greg saying he had a signed deal memo. Hang on! This isn't right! They're supposed to mess around for months and then a "sorry", but...

## Pre-production

So, into pre-production; three weeks to the start of shooting. We had a lot of discussions on which camera to use, and it came down to the Sony F950 with HDCAM SR or the Grass Valley Viper with S.two recorders. I wanted the Viper. I'd tested all the available top-end cameras last year and felt that the Viper was streets ahead. However, the F950 looked as if it would cost a lot less. Happily, Motion FX managed to come up with a Viper package that worked and the guys at Plus8 in the States were hugely helpful too.

I start working on the look, establishing the overall look of the film with Simon by using Viper images that I had shot at Idiff in Cannes; they

were of me holding a G&D chart in sunshine. We'd play with these in SpeedGrade, and when we got close we did before/after prints using a Canon Selphy and left them for a day or so. We'd then go back and repeat the process. Finally we had the look we liked.

I now run into a huge problem – not with the film but with this article. Because the film has such a long post period – 15 to 18 months – the producers don't want any early leaks of story, etc. I can understand this; you want to build interest much nearer the release date, so what can I write about in this article? Not a problem, I'll write about the kit and how it worked; the film's story and the look of the actual film can come in an issue next year.

So first, take a look at the illustrations of me with the chart shot at Idiff. This may or may not be the look of the film, but it certainly gives an idea of the process! I have to say that for all people's fears about reliability, it all proved remarkably stable. I know there's at least one person reading who would argue with this, so let me expand.

### Camera

I know the Grass Valley Viper well, as I shot the launch material for it over four years ago and have demonstrated it many times since, but for those of you who don't, here's some basic info. It's a three-chip 2/3in camera, but it's very different from other 2/3in chip cameras. Whereas other cameras have chips that are 1080x1920 pixels (which is what you need for HD), the Viper chips are 4320x1920, and they average the extra pixels to whichever format you're shooting in, so you have the advantage of that extra data to start with. I guess it's kinda like scanning film at 4K and then sampling down to 2K; it looks much better than a raw 2K scan. The electronics are 12-bit and by converting to a 10-bit log file the entire dynamic range is held. In practice, the dynamic range is 10 stops.

The camera outputs a totally raw unprocessed signal, no colour correction, no detail correction, no matrix – just pure raw images that you can process later. In practice, this means that in situations where ultra-clean and detailed edges are required, such as a 300ft green screen job, it is the ultimate digital camera.

I find it interesting to listen to people say that cameras with a single chip are much better, as they have a lot more pixels; well they don't, actually. Even cameras that claim to have 4.5Kx2.5K don't. Well they might, but – and it's a big 'but' – they have to extract the RGB signals from that chip, so in fact they have half that number of pixels for green and a quarter each for red and blue. The Viper has, in round figures, 4Kx2K for each and every color. That's way more than any of the single-chip cameras, real or imaginary!

We had absolutely zero problems with our cameras; we carried two, mainly for peace of mind, but also so that we could rig one body on a device of some kind while continuing 'normal' shooting with the other body. The camera was exposed to torrential rain, fireballs, tons of dust – I mean TONS of dust – and all kinds of mechanical shocks. We had the software on one of the cameras updated while we were shooting – no way was I go to mess with both! This was to re-activate the electronic shutter facility, as it had been disabled during a previous software 'improvement'. This went well and we were able to add a 45deg electronic shutter to the 90-180 and 270deg mechanical shutters we used for various effects.

We had to add industrial grade Velcro to most of the camera so that we could attach accessories such as the Arri LCS and battery, and a large Inclinometer. A 6in monitor was also permanently attached.

We tried using multicore and BOBs for convenience; we could get signals back and forth as well as power the camera down one cable. After three of these blew up we moved to powering the camera at the head using standard camera block batteries on the dolly and a 4-way BNC/video cable loom. This was to give us two cables in use and two spares at all times. I was very skeptical about using BNCs, but it was only in week nine of shooting that they started to go. Of course, once they started...

For most of the shooting we replaced the standard VF with the new two-piece Accuscene. What can I say? It worked; very low, totally imperceptible lag and good pictures. My AC loved the pre-sets as he could zap in to a setting for focus instantly and then get it back to 'normal' (see Dan Lightning's article). My only query about this VF is to do very high temperatures. We were shooting in non-air-conditioned studios on days when the outside temperature approached 30degC, and we were using large fireballs in the stage. Occasionally, the VF would switch off; we assume due to the heat.

### Lenses and filters

We shot exclusively with DigiPrimes – all of them – and they looked great. I also had the privilege of being one of the first DPs to use the new 17-112 DigiPrime. We only got it at the end of the film, but if we'd had it at the start, I have a feeling that the whole film would have been shot on that and the 3.9mm. Both lovely lenses.

I tested magenta filters pre-shoot, but as we got the best green screen results without it, I shot most of the film without any filters. For one specific sequence that needed to look very different from the rest of the film I used a Formatt Skin-tone Enhancing filter, which gave me very much the look I wanted, and for one scene involving more than usual amounts of a young woman's skin, I used a Formatt HD Soft Effects Gold, which looks great.

### Monitoring and LUTs

This was an area where I lost my battle for kit. I wanted a CineTal and I got a Mac and an HDlink. I know, cost. At least I had an 8in Astro with built-in Waveform, etc. This proved invaluable in establishing very even greenscreens; the better I could make the screens, the faster post would be. We aimed for 50 per cent exposure in the green and less than 10 per cent in the red and blue. I also had a Sony 23in LCD, but its backlight was very uneven. I was rescued by Filmlight, but first... As I've already said, I established the overall look of the film with Simon by using Viper images of me that I had from Idiff. Unfortunately, the LUTs I could generate at the time were 1D, and therefore didn't contain any saturation information. This is where I was rescued by Filmlight – or rather by Men from Mars and Filmlight. M-f-M is doing all the post work on this film – all 15 months or so of it, God help them! So they decided it would be best if they could manage a calibrated viewing system throughout the post process. They're a Baselight facility, using Truelight to manage color matching. Now, if I had a Truelight calibrated monitoring system... this is how I came to be using a Truelight box loaned by Filmlight and a calibrated Mac monitor courtesy of M-f-M.

We took my reference frames and the .jpg that SpeedGrade had generated to M-f-M (actually I emailed the whole lot to them); their colorist matched my look and loaded it into the Truelight box, and actually we loaded three looks.

After the first day of shooting I went to M-f-M and tweaked the main look, and as this was just a tiny neutralizing of highlights it took no time at all. We then loaded this set-up into the Truelight box and used it for the rest of the shoot. All daily QTs, in DVCPRO HD100, and all the reference DVDs were then made with this look applied.

Of course, it would be much easier today, as the latest beta I have of SpeedGrade will now output LUTs for the Truelight box directly; it'll also do Luther, HDlink, S.two and a whole bunch more. Of course, as I've found, some of these LUTs are pretty useless. Sorry folks, but what is the use of a LUT that won't let you alter saturation!!?

### Recording

We used an S.two hard disk recorder and we shot 71 d.mags over nine weeks, with no problems other than those that became totally predictable. Each mag gave us 33 minutes of shooting time. Using an a.dock from S.two, we transferred it all to two LTO2s on-site with very few problems. These LTOs were then split; one was kept in the production office and one was shipped to M-f-M. Once we got a report back that they could read the LTO and had transferred it to their DVS Clipster, we would recycle the d.mag that we had been keeping safe in case of transfer problems. We needed eight d.mags to allow us to have mags always ready to shoot, but also to never re-use a disk until it had been transferred to LTO and from that to the Clipster. So what were the problems? And how did they affect us?

There's a totally predictable error that comes immediately after loading a new mag. Ninety per cent of the time you'll get a frame error during the first take. Now there are two workarounds to this; you can scream and shout that the system has gone wrong or you can quietly record a shot and delete it before telling anyone that you're re-loaded. This lets you have the frame error privately and costs maybe 30 seconds. Guess which approach was more popular?

The other predictable error is that if you decide to alter a whole bunch of the slates that the S.two electronically generates at the start of each take, the software is likely to crash at the end of this, which then means a couple of minutes re-loading the software. Again, there are two approaches to this: rename slates just before a take and scream that the software has crashed, or wait until there's a camera reposition and do it then. Once again, one approach was much more popular. So having said that, how do I feel about S.two? I love it. Of course, it has a few problems, but I've also had mag jams, scratches, fogging, and on and on. I had fewer hassles here and spent less time re-loading than I would have done shooting film.

I love being able to grab real frames from what I'm shooting, take them back to my hotel room and play with them in SpeedGrade, first applying the standard look and then playing; I love being able to print these out as references. I had a folder next to me at all times that had prints of every scene that we'd shot in it. I love the fact that the editor is looking at pictures the way I intend them to look; I love the way actors could look at full-res replays with the final look applied.

### Lighting

So what have I missed? Oh! Lighting. We tested a number of different ways of lighting the green screen and ended up using KinoFlo 525 Green Screen tubes, as these gave us the cleanest key at the lowest light level. We had hundreds of them, using four banks at the top and two banks at the bottom. We had them on 6ft centers, which meant a gap of less than 2ft between lamps.

Key lights varied depending on the set and went from 20Ks to 6K Arri Xs, which I love for their really, really hard shadows, and of course the 5K MoleBeam featured a lot. I also used a lot of Source 4s for patterns, but also had MAC 2000s for patterns I wanted to control in shot – water ripple effects mainly. Lots of 5Ks through gobos and an enormous amount of Dedos.

There were two real lifesavers in the lighting area... well, three actually. First was remote dimmer control of everything; second, large Springballs on huge boomarms, so that I could drop in a little local fill or rim; and, of course, the real get-out-of-jail card: the Kisslite from Gekko. This ringlight was remote-controlled, so I could gradually dim down the fill as the camera got closer to an artist. I could do this from a fair distance away while watching a monitor. This approach meant I could light the set in a very high-contrast way, but reduce the contrast for important close-ups.

Although I used my meter in the normal way, as did my gaffers, to establish the base light, we used the monitors with the Truelight look applied to fine-tune, as we were able to see exactly what we were getting.

It's odd for me that I switched from film to video once before in 1980, thinking that the time had come and that it would replace 16mm. I lost a lot of money pioneering then. I switched back to film for the majority of my work, but have always tried to keep tabs on where we were going digitally. I watched as people said the F900 was wonderful; I tested and decided that it wasn't: not that it's bad, it's just not good enough.

The Viper came out, but the workflow wasn't right. Then the Genesis and the D20 came out, and the Dalsa, and the Viper found a workflow and things started to change. Now I'm totally happy to shoot digitally; there are some jobs I still think film is more appropriate for – and I'll use it as required, but we are now entering an era of rapid change.

DPs need to learn this kit if they're going to survive, and it's no good thinking you can lean on an HD-savvy AC to cover for you: there aren't enough to go round; believe me, I get an enormous amount of calls from DPs who want HD ACs. If the DP knows HD, then he can easily teach any good film AC.

So, a message to producers: don't just pick any DP for a digital shoot, pick one who knows digital, otherwise you're not going to get the best out of the format. But then I'd say that to a producer about to shoot on film who thought that they could use a video-trained person.

I think you might have guessed by now that I would like to do this again – but on disk, not tape.

*Box copy*

### Monitoring with the Accuscene viewfinder

**Dan Lightening:** I was 1st AC on *Mutant Chronicles*. The Viper was supplied by John O'Quigley at Motion FX who, after a couple of weeks

of shooting, managed to provide us with the brand new Accuscene color HD viewfinder, hot off the production line. In fact, the Viper system is advancing so quickly that the camera system went through various updates as we were shooting. As well as the viewfinder, there were software updates to give us, featuring among other things more shutter options (not all of which were particularly smooth or problem-free). We also took delivery of the new Zeiss DigiPrime 17-112 T1.9 zoom, which was very impressive.

Physically, the Accuscene viewfinder is quite a neat package consisting of an independent short style viewfinder connected to the electronics box (which sits on the standard video viewfinder mount on the camera) via a cable, and held in place by an engineered curved bracket that gives you a lot of movement options. Most electronic viewfinders only rotate on one plane and make operating in a non-conventional position difficult. I expect many people have resorted to camera tape to get viewfinders in a position to be able to operate. With the Accuscene in normal mode you can rotate it through 360deg as well as pull it away from the body at 90deg. A very useful feature for 1st ACs who can do a quick eye sharp at any point without having to move the operator from behind the camera. It also makes operating easier in, for example, ladderpod situations, where instead of climbing and leaning right over the camera to see an image you can climb up the side leg and pull the viewfinder out at 90deg – a lot easier and less dangerous. If you unscrew the viewfinder from the bracket (very easily to do and no tools necessary) you can reconfigure it to operate on the other side of camera. Nowhere near as efficiently as an optical film VF, but not bad. The VF also has a smooth-style diopter-setting knob similar to an Arri viewfinder, rather than the 'clicky' style of normal video viewfinders. Image settings are controlled by one small multitasking button, which gives the whole package a smooth look.

The only slight criticism I could make is the possibility of wear and tear. We used it for about eight six-day weeks and it held up pretty well apart from the hand screws holding the VF to the bracket, which became easily loosened towards the end, meaning the VF would flop out at 90deg sometimes during a take. Although the discipline of keeping it tight at all times may also have lapsed towards the end! The other issue is the cables. There is a cable that powers the viewfinder off the 12v output at the back of the camera, which has to travel the whole length of the camera body; a cable between the viewfinder and the electronics box and a cable from the electronics box to the standard viewfinder input on the camera. Although we didn't have many problems with this, there were occasional snags on the pan bar when removing the camera, which resulted in some wear and tear on the flimsy 12v power cable and 4-pin fitting, which after much more use would need fixing or replacing.

The image quality of the viewfinder is extremely impressive and offers five preset settings that you can quickly switch between using the single multitasking button. We had preset 'A' as raw HD with a little bit of crispening from the camera menu. This gives you a slightly green image, but generally a very high quality look-through, with very little obvious delay when panning at 24fps, something I have always found very frustrating with other HD viewfinders. As far as electronic viewfinders go, this one is about the sharpest and clearest I've seen, as well as offering accurate and extensively adjustable color images. On preset 'B' I was able to use the electronic magnifying feature very similar to using an optical magnification on a film viewfinder. I also had the peaking wound up for checking eye sharps; I could switch to preset 'B' and make things much easier for myself. This was also extremely useful for checking the back focus on the Zeiss DigiPrimes using the 'sharp max' device, which goes on the front of the lens and projects a focus chart to which you adjust your back focus.

However, despite the simplicity of the preset system, we had some difficulty at times applying a look that we wanted to a particular preset, and occasionally the changes we made would not save. There were also instances of saved settings changing for no apparent reason. These problems often occurred on hot days in the studio when the kit was particularly hot. In fact, in these situations the VF would sometimes not 'strike' when you turned the camera on, so you would have to independently power down the viewfinder for a few seconds to get it to work, frustrating when monitor watchers have already got a picture and are waiting for you to frame up while all you're seeing is flashing lines until it settles down. I'm sure with more time and some instruction I could use the menu more efficiently, but sometimes it seemed a little unclear and not very responsive. Despite this, the Accuscene is the best electronic, color viewfinder I have seen to date and generally allowed us to work efficiently and effectively.

*Daniel Lightning has been working with cameras for about 12 years. He worked as a film documentary assistant, but later moved to commercials and drama. Recent projects include I'm With Stupid for BBC drama.*

Box copy

## Martian chronicles

*Mutant Chronicles vfx supervisor Phil Attfield explains why it was important to have a print-emulation grade on-set from the start of shooting.*

We've used Filmlight's print emulation technology, Truelight, at Men-from-Mars for more than two years in our digital intermediate and VFX workflow. The benefits of a color management system for DI and VFX are obvious. But why did we use it on set for Mutant Chronicles? Why weren't we happy with a 2D look-up table (LUT) on set? What was the point of print emulation at such an early stage of the production? Didn't it cost the earth to have Truelight on set? These were all questions fired at me during the first couple of weeks of production.

In my experience as a VFX supervisor, I've tended to work with directors of photography during production and then not see them again until the final grade. This means that sometimes I'm second-guessing the grade and look a DP wants for a given scene. A movie such as *Mutant Chronicles* has a lot of partial and virtual sets. The level of detail that will be apparent in the final release print depends just as much on the DP's grade as the work of digital artists. As a VFX supervisor I have to ensure we don't waste any VFX resource on something that'll be lost forever in shadows after the final grade and stands up to scrutiny on the big screen.

As well as needing to share Geoff Boyle's vision for *Mutant Chronicles*, Men-from-Mars was tasked with creating the digital dailies for the show. After a brief chat, Geoff and I realized that we shared the same objective: we both wanted our director Simon Hunter, the on-set crew, editorial and vfx artists to see the same graded pictures. We wanted consistency across a range of viewing environments prior to the final grade. Even allowing for less-than-perfect viewing conditions, I felt we could achieve this using Truelight.

Test dpx frames were shot and graded by Geoff Boyle before printing hard copies. The hard copies and original frames were given to M-f-M's colorist Adam Christopher. Once Adam had match-graded the dpx frames on our Baselight, we translated the grade into LUTs for specific scenes using the Truelight software. The LUTs were then loaded into the Truelight hardware box attached to the output of a DVS Clipster, in virtual VTR mode, for loading in to Final Cut Pro. Using the Clipster and Truelight box we were able to give editorial footage with Geoff's overall look for each scene, and all the usual burn-ins derived from the dpx headers.

The same LUTs were loaded into a second Truelight box on set and viewed on the same model of monitor as editorial is using. Geoff was able to tweak the LUTs by phoning in minor adjustments to Adam, and new LUTs were derived from the grade and loaded into the two Truelight boxes. VFX artists at M-f-M also have access to the Truelight LUTs as Shake nodes.

So, we have achieved our objective of sharing the same vision across the production. I haven't come across Truelight being used in this way before, but we certainly didn't use it because we were trying to prove any particular color science point. Truelight just gave us the functionality we wanted. The only 'extra' cost is the on-set Truelight box, which can be built into the cost of making digital dailies for editorial. Using Truelight on set has been cost effective, technically simple and given everyone an early preview of Geoff's vision.

*Phil is creative director at Men-from-Mars, specializing in vfx for film and TV dramas. He has worked on commercial, promo, drama and feature projects for over 20 years as an editor, vfx artist and vfx supervisor. He has been nominated for both Emmy and BAFTA awards.*



## Geoff Boyle

Reel Show cinematography editor Geoff Boyle's recent feature films as director of photography include *The Mutant Chronicles*, *Dark Country* and, currently, *Street Fighter 2*. He received his first camera, a Brownie 127, when he was eight. From then on the future was clear. After art school in the late 60s, he worked as a stills assistant. One day he was asked if he knew anyone who could film a concert. Of course he did! He moved into film and shot documentaries for TV, 10 years or so of *20/20* for ABC and a lot of music videos. In 1985 he shot a 'making of' about the Pirelli calendar. Terence Donovan liked the way he lit and asked him if he shot commercials. From 1990 to 2005, he has shot almost entirely commercials, with occasional sidetrips into drama, a short he shot – *About A Girl* – winning a BAFTA in 2001. He also shot special effects on *Enemy at the Gates*, won the SMPTE Eastman Gold medal in 2000 and was made a fellow of the BKSTS that year. He started the cinematography mailing list (CML) in 1996 with 60 members. It now has over 3,000 members in 148 countries and is acknowledged as the pre-eminent internet site for cinematography.