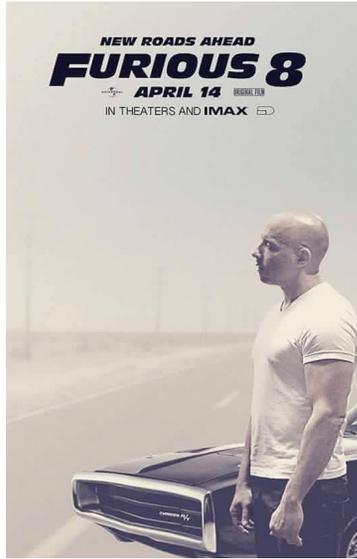


C O D E X

2017 - ISSUE 9

GHOST IN THE SHELL | KONG: SKULL ISLAND | LIFE



Cover image *Ghost in the Shell* – Captured on Codex Director Rupert Sanders Cinematographer Jess Hall BSC

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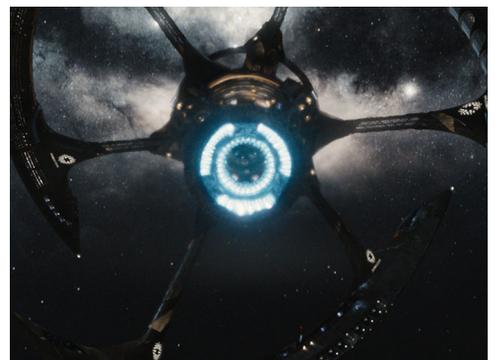
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SHEDDING LIGHT ON WAR

Cinematographer Michael Seresin BSC on *War for the Planet of the Apes*



“THE CODEX SYSTEM REALLY SPEEDS THINGS UP”

Michael Seresin BSC

War for the Planet of the Apes is the third instalment in the blockbuster franchise which follows highly evolved chimpanzee, Caesar, and his struggle to defend his race against an army of humans, led by a deadly and tyrannical Colonel. Caesar is forced to reconcile with his inner ruthlessness as he goes on a journey to avenge the death of his kind. As he comes face to face with the perpetrator, Caesar is pitted against the Colonel in a final battle that will determine the fate of both species and the entire world.

Digital technology is remaking toolsets in many fields, but in filmmaking, the pace of change is nothing short of astonishing. From one project to the next, the tools are refined and redesigned based on the artistic goals and tangible realities presented by this endeavour. Into this ongoing evolution steps Michael Seresin BSC, a cinematographer who resolutely insists on keeping the ones and zeroes at arm's length. After successfully overseeing the sprawling, high-tech operation that led to *Dawn of the Planet of the Apes* in 2014, Seresin re-teamed up with director Matt Reeves on *War for the Planet of the Apes*. Although the former film, *Dawn*, earned upwards of three-quarters of a billion dollars at the box office, the latter was not to be a carbon copy in terms of its look. To begin with, *Dawn* was shot in native 3D while *War* was done with the large format ARRI ALEXA 65.

"The whole idea of the shallow depth of field was baked into the concept of this movie from the very beginning," says Seresin's first AC, Taylor Matheson. "Michael tends to light economically and likes wide open stops, and Matt and the studio wanted something that was shot wide open. We shot a lot of material at minimum focus. The appeal of the ALEXA 65 was obvious; the resolution and the ability to create a very rich negative, and the option to play with it in post - to zoom, reframe, and do all sorts of directing after the fact. But of course, the bigger the sensor size or the larger the film negative, the shallower the depth of field. So, from a technical perspective, it was an incredibly challenging movie."

In a widely-varied career spanning 45 years, Seresin's camera has brought us *The Ragman's Daughter*, *Midnight Express*, *Fame*, *Birdy*, *Angel Heart*, *Come See the Paradise*, *Angela's Ashes*, and *Harry Potter* and the *Prisoner of Azkaban*, to name a few.

"Some cinematographers love the whole technical aspect of digital filmmaking," says Seresin. "I'm of the generation which came up with analogue film, and I use the same principles of light. Composition's composition and we use light, camera movement, et cetera as we did before - however you achieve that, to me, is secondary. There are more options and flexibility with digital, but it sort of worked fine before. Probably the biggest restriction is accommodating the CGI guys. It doesn't alter my lighting. It doesn't alter the composition. I just hire people who know about the technical stuff. There are infinitely smarter people than me and they love that. They are concerned with making the technical element work, and I concern myself with lighting and composition and do as I would have done had we been shooting on film."

Subtle camera movement also plays an important part in the

“HERE CODEX HELP AGAIN. ONCE I HAVE SET UP THE WORKFLOW, MY LOADER CAN STAY ON TOP OF THE DAY-TO-DAY TASKS AND KEEP THINGS ROLLING. IT'S A PRETTY EASY SYSTEM TO UNDERSTAND.”

Michael Seresin BSC



look. More than half the shooting situations were vast night exteriors accomplished on a massive set. Seresin says the imagery is "on the darker end of the spectrum."

"We opened the film shooting on Vancouver Island, and things felt kind of heavy and overcast and dark and miserable and rainy, he says. Then we got a week of the most immaculate, sunny weather, but it gave it a whole other look. In the bigger scheme of things, it worked so much better because it's such a different part of the movie. It looked sort of prehistoric, which works. We dropped the colour out - the overall look of the film will be quite monotone. Matt and I have a shared aesthetic and that makes it much more enjoyable, for sure."

At times, as many as eight ALEXA 65s were in use on the shoot, three or four on the main unit (often on Libra remote heads, Techno-cranes or Techno-dollies) and often three on the second unit. The package constituted roughly a fourth of all the ALEXA 65s in existence at that point. The camera's sensor is

3.7 times the area of the ALEXA XT's. DIT Simon Jori says that the ARRI sensor is a perfect tool for Seresin's naturalistic, low-key lighting, in which a contrasty, dark and moody LUT often interacts with hot key light.

"That ARRI sensor has a beautiful filmic response to light, both in how it rolls off highlights and in its sensitivity and roundness in the low end," says Jori. "It never looks like 'video.' Michael's single-source approach to light combined with his utter fearlessness of the dark side, roots exposures firmly in the lower end of the scale, and leaves a real honesty to the images. They never look lit but still have an energy."

With the ARRI Prime 65 lenses, wide open meant T2.2 to T4.8, depending on focal length. Matheson was challenged, yet thrilled by Reeves's treatment of focus as another creative element. It was his second project on the ALEXA 65.

"Rather than play the focus in a way that is conventional or normal, Matt's approach involved a process of discussion based on the content of the script," says Matheson.

"Focus pulling is very technical, but there can be an emotion and a feeling toward it. It can add to the disturbing or off-putting nature of certain shots, or add to the harmony and flow. We were only able to do four to six shots a day. Care was spent on every camera, every set-up. This was a demanding show on many levels, and it made me better at what I do."

Low light situations were not a concern, according to Jori. "Honestly, 1280 ISO on the ALEXA 65 looks better than 800 ISO on regular 35mm digital cameras," says the DIT. "That's a real bonus considering some of the medium format lenses that are needed to cover the large sensor area, are not as fast as we are accustomed to using. Usually when one 'gains up' a digital camera signal a stop or more, the otherwise insignificant electronic noise, lurking in the shadows and mid-tones of the shot, is exponentially increased - often resulting in objectionably coarse and grainy images. With the ALEXA 65, the pixels are so relatively small compared to the final frame size that any increased noise is so fine-grained that it has far less apparent effect on the image. We could increase ISO to 1280, 1600, even 2000 if needed without suffering problematic noise levels."

SXR Capture Drives were new on the market at that point, and they enabled the crew to record full 12-bit 6.5K sensor data in ARRIRAW at up to 60fps. The 2TB capacity of each drive could record more than 43 minutes at 24fps - the equivalent of a 4000ft roll of 35mm film. That gave Reeves the freedom to do very long takes, thus allowing the actors to get into a rhythm. "Sure, there are CG apes riding horses, but believe it or not, this project is really all about the acting and the audience's connection to the characters," says Jori.

Two separate and programmable video monitoring outputs on the ALEXA 65 are features that DITs love. "I can set up one for me to grab a LogC feed - non-colour graded to see the full range of the sensor signal - and leave the other in a more immediately viewable Rec709 mode for on-camera monitoring," says Jori. "The assistant feed can also have separate status

information and image magnification applied to it if needed without affecting the LogC feed to me at the DIT station."

At the DIT station, Jori used Pomfort LiveGrade, driving BlackMagic Designs HDLink boxes. He applied a base 3D-LUT and performed a fine-tuning colour grade under that within the ASC CDL format. The LUT used was designed by Seresin and SHED colourist Matt Watson during prep. The LUT was slightly softer than the regular ARRI K1S1, with an EXR style colour palette and a cool bias for a post-apocalyptic feel. The colour-graded 1920x1080 4:2:2:2 signals were displayed for the DP on calibrated Sony 25" PVM OLED monitors in a light-controlled environment.

"You are sitting in the dailies screening room in real-time right there on set," says Jori. At the DIT station, we have iris control of all cameras. That's a fantastic way to work, keeping the camera exposure right where it needs to be at all times, riding it during shots as required. Combine that with on-set colour grade control and you have the perfect way to keep the exposure in the sweet spot of the sensor, to ensure the final DI has the room they need to produce those images we were seeing on set. That control is vital when riding the creative edge of exposure, as was our mantra."

The Codex Capture Drives, once ejected from the cameras, would be taken to the camera truck for downloading using a Codex Vault XL. "The Codex system really speeds things up," says Jori. "It allows for very fast transfers of the large amounts of data from the drives to Codex's proprietary 8 TB flash memory transport drives. The speed here was important, helping our loader, Preston Cooke, keep on top of all that footage. We had 20 TB of footage some days!"

The Codex Transfer Drives were sent to a mobile truck lab operated by SHED, the boutique post house in Santa Monica

founded by Yvan Lucas. SHED used the truck for remote work and set up their operation in the production office for the studio and backlot work. There, a second Codex Vault XL unit would take the 8 TB Transfer Drives from set and allow SHED data manager, Stephan Marliss, to quickly transcode the ARRIRAW files into 4K ProRes (as mezzanine files) for the fast creation of the editorial deliverables in FilmLight's Daylight system. Marliss and colourist John St. Laurent, would incorporate colour grade information from set - polish the look as needed, and generate dailies files, archives, and other deliverables.

"I really try to stay focused on the shooting process," says Jori. "If I can bring someone else up to speed on the downloading procedure so that my attention can stay on assisting the DP, I will every time. Here Codex helps again. Once I have set up the workflow, my loader can stay on top of the day-to-day tasks and keep things rolling. It's a pretty easy system to understand."

Codex works together with SHED to help Jori make sure the technical side is invisible to Seresin.

"Everything was seamless," says Seresin. "The quality of service they gave was immaculate. We didn't have them last time on Dawn, and on this one, having them really paid off. The lab technician, John, was absolutely brilliant. The dailies were beautiful, pretty much as Matt and I had seen it in the DIT tent. In terms of footage shot, it was massive, and we were working pretty ferocious hours. We were so pleased, and we trusted them. The mobile unit, as well as the California operation, is pretty slick. But it's not just the machinery - it's the people who are just on it, that really come through. I like that they are a small company, and I know the bosses."



SUCCESS STORY: WAR FOR THE PLANET OF THE APES
CINEMATOGRAPHER: MICHAEL SERESIN BSC
RELEASE: 2017

Twentieth Century Fox plans to release *War for the Planet of the Apes* in July and August 2017 for varying countries. Check your country's listings for an exact release date.

"IT ALLOWS FOR VERY FAST TRANSFERS OF THE LARGE AMOUNTS OF DATA FROM THE DRIVES TO CODEX'S PROPRIETARY 8TB FLASH MEMORY TRANSFER DRIVES"

Michael Seresin BSC





BRIDGES TWO WORLDS

Netflix, Amazon and HBO are changing the equation in the television business.

The distribution model is disruptive, the production slates are prolific, and the money spigot is on. The ripples are being felt far and wide, not least behind the camera, where cinematographers are given the budgets and schedule – and the freedom – to create quality.



A good example is Netflix's *The OA*.

"Netflix takes risks," says *The OA* director of photography Lol Crawley BSC. "No one wants to fail, but they take risks with the content, and that makes you bolder and braver in your choices. The format can change – our show no longer has to have commercial breaks and last a certain number of minutes. Storytellers are embracing these new structures. I found Netflix to be incredibly supportive and hands-off. They let me just get on with it."

In the long history of cinematography as practised within the realities of television production, that is a rare sentiment indeed.

Crawley was nominated for a 2017 American Society of Cinematographers Spotlight Award for his work on *The Childhood of a Leader*. He took top cinematography honours at the 2008 Sundance Festival for *Ballast*, a film he credits with helping get the gig on *The OA*.

The OA is a mystery that blends sci-fi and fantasy elements. Co-creator and co-exec producer Brit Marling stars as a young woman named Prairie who resurfaces after having gone missing seven years ago. Blind at the time of her disappearance, she has somehow regained her sight in the interim. Over the course of eight episodes, she tells her story to a group of recruits, whom she needs to help rescue other missing people.

On *The OA*, Crawley and his team shot for about 86 days. Exteriors were done mostly in Woodbury Hills, north of New York City, and many of the interiors were done on sets constructed at Kaufman Astoria Studios in Queens. Cameras, lenses and Codex equipment were provided by Panavision New York. Crawley thought of the show as a five-hour feature film divided into two worlds: a more real, recognisable setting in current-day Michigan, and the place where Prairie begins her captivity, which is depicted in a visual style that feels more documentary.

Netflix stipulated that the recording format be 4K RAW.

"We chose to shoot everything on the Panasonic VariCam 35 with the Codex V-RAW recorder," says Crawley. "That was the way to go for RAW capture. We shot the Michigan scenes with Panavision anamorphic lenses, but with everything framed in 16:9. For the other setting, we designed a more handheld, searching style, and I shot with spherical lenses. It's subtle. Hopefully, viewers can sense the aesthetic difference, but are not quite able to identify the difference."

Before choosing the VariCam 35, Crawley considered various RED cameras as well as the Sony F55 and F65 cameras. He also tested the Sony A7x.

"I was keen to emulate the look of a still photographer named Todd Hido," he says. "The mercury vapour lamps in his photography have a strange, ghostly light. His work feels more caught and less engineered than Gregory Crewdson, as good as Crewdson is. Hido shoots a lot of night photography with long exposures, and obviously that's not going to work shooting

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“WE CHOSE TO SHOOT
EVERYTHING ON THE
PANASONIC VARICAM 35
WITH THE CODEX
V-RAW RECORDER”

— — — — —

Lol Crawley BSC



moving images. But one of the reasons I went with the VariCam was that it has an 800 ASA native setting as well as a 5000 ASA native setting. I wanted to shoot night exteriors in a very

real environment, and try to light with film lights as little as possible. Increasing the ASA seems like the natural thing to get more light in there. Besides, I kind of like the noise at 5000. I wanted to be brave and bold and shoot as much as possible with a very high ISO."

Crawley prefers to operate the camera himself when possible, especially in handheld situations. Certain complex scenes were storyboarded, but often the handheld scenes were more instinctive.

"The way that a camera operator finds a frame, and the way a still photographer finds a frame, is a hard thing to articulate," he says. "I like to watch a scene and respond to it. I like reflections, and I like shooting through doorways. I like natural light or the feeling of natural light. I like to be quite bold with the exposures. You feel in your gut the way you'd like the master to play out. I've done shows where the director forced a certain approach to headroom, for example. On *The OA*, Zal booked me for a reason – largely the way I compose, along with lighting. My handheld tends to be quite responsive – I try to lock in with the actors and react and respond to what they're doing. So he let me run with it, for the most part."

Crawley and his DIT, Matthew Selkirk, used a process of live grading to achieve minimal discrepancy between his intentions on the set and the imagery he brings into the colour correction suite. In post, the grade was done at EFilm with colourists Tim Stipan and Tom Reiser.

Early on in the process, Crawley and director and co-exec producer Zal Batmanglij had seen a test of high dynamic range (HDR) imagery and didn't think it was right for the project. But during the grading process, they revisited HDR.

"My first impression of HDR was that it felt like the difference between looking at a photograph and a projected slide," Crawley says. "In a sense, the light really does feel like it's coming from the image, especially with clouds or points of light like practical lamps. We thought it would be great if every time we went into the story, it popped like that, and in the more familiar, naturalistic setting, we suppressed or calmed the HDR down in order to make it feel like something we're used to seeing."

During the shoot, the VariCam 35 and the Codex recorder were capturing all the information necessary to make these HDR manipulations in post.

Netflix was "incredibly supportive" throughout the post process, Crawley says. "They were very generous with grading time, and let us get to where we needed to get to."

The OA debuted on Netflix in December of 2016 and was recently renewed for a second season. Critic John Doyle of *The Globe and Mail* said, "*The OA* is Netflix's strongest and strangest original production since *Stranger Things*. In terms of substantive, original drama, it transcends it. Mind you, it is unclassifiable in the context of drama, mystery, science-fiction and fantasy, since it is straddling all sorts of lines and blurring them. It is outright astounding and brilliant, too."

CIRCLE OF LIFE

Codex helps DIT Francesco Giardiello harness a multi-camera and colour workflow

The camera-to-post digital workflow for *Life*, Sony Pictures Entertainment's \$80m sci-fi horror, directed by Daniel Espinosa, was supervised by DIT Francesco Giardiello.

Working in collaboration with the movie's cinematographer, Seamus McGarvey BSC ASC – plus DI colourist Peter Doyle (who did not do the final colour grading due to scheduling) and colour scientist Phil Oatley from Technicolor, and Luke Moorcock, John Bush and James Corless at Pinewood Post – Giardiello harnessed Codex Vault S to create a full ACES-compliant pipeline for rushes emanating from a wide range of digital cinematography and consumer cameras used on the

shoot – including two ARRI ALEXA 65 large format cameras, two ALEXA Minis, Codex Action Cam, Flare 4K SDI, Sony A7s-II, GoPro4 Session HD and Apple iPhone 6S – creating a fast and reliable pipeline.

The production of *Life* was based at Shepperton Studios, UK, where the action took place on multiple ISS replica sets on H and R Stages. Giardiello, who also worked as the DIT on first unit, with Sean Leonard the DIT on second unit, set-up a Codex Vault S workflow system on H Stage, as the primary collection point for all footage. He was supported in ingest, metadata management and transfer routines by data wrangler Kristin

Davis. Pinewood Post (based at Shepperton), used Vault XL to perform the cloning, QC and LTO-tape back-up tasks, before separately making the editorial and VFX deliverables.

"I have used Codex every single day of my working life since 2010, and can genuinely say that you can trust it, it works," says Giardiello, whose DIT credits using Codex include *Knights of the Roundtable: King Arthur*, *Christ The Lord*, *Ben-Hur*, *Pan*, *The Man from U.N.C.L.E.*, *Thor: The Dark World*, *Romeo & Juliet*, and *Game Of Thrones*.

"For creative and technical reasons – including the tight shooting environments of the ISS sets – Seamus used a variety of cameras on *Life*. As 80% of the movie was shot using the ARRI ALEXA 65 and ALEXA Minis, at their highest ARRIRAW resolutions, Seamus needed the smaller cameras to work at their best-possible resolutions. This would also ensure the VFX teams were able to do their wire-removal and set-extension tasks at the best possible image quality," says Giardiello.

"Thanks to the development strategy of Codex, Vault can now read and ingest many common file types. For any cameras that do not output these common file types – and those with their own proprietary formats – we found new ways to transcode the footage into the highest-quality, Vault-readable formats, before ingesting them all into the Codex workflow."

Codex has worked closely with ARRI for many years, and Codex Vault automatically provided an optimised ingest workflow for the ALEXA 65, 6560x3100, 12-bit ARRIRAW and ARRI ALEXA Mini 3424x2202 ARRIRAW files. Codex has also optimised the workflow for Codex Action Cam HD enabling the speedy ingest of 1920x1080, 12-bit Codex DPX files into the Vault.



The Prime 65 lenses, fitted to the ALEXA 65s, and Panavision Primos, used on the ALEXA Minis, both feature Lens Data Systems (ARRI's LDS for the ARRI Prime 65s and external encoders for the PV Primos), allowing frame-accurate metadata about focus, iris and zoom settings to be recorded within the uncompressed ARRIRAW image stream. During production, this metadata passed along with the pictures, through the Codex workflow – from the in-camera Codex SXR Capture Drives (used with the ALEXA 65s) and CF2 cards (used with the ALEXA Minis, and cloned into Codex XR Capture Drives for better data management efficiency) to the near-set Codex Vault S, before processing on Vault XL at Pinewood Post.

For the other cameras used during production, Giardiello employed a number of third-party solutions, running on a separate workstation, to process and transcode the images into ACES-compliant, Vault-readable formats, before ingesting them into the Vault. Production data wrangler Kristin Davis used the Vault's file-card system to manually input metadata and perform file-naming routines to make the footage compatible with that coming from ALEXA 65, ALEXA Mini and Codex Action Cam cameras.

The Flare 4K SDI, 3280x1842 files, were converted from DNGs to Open EXRs using a custom script written in DCRaw. The Sony A7s-II's, 7952x5304, ARW and 4K UHD MPEG4 files, plus the GoPro4 Session HD, 1920x1080, H264 MOV files, were converted to ProRes 4444 using FilmLight's Daylight by Pinewood Post.

For the iPhone sequences, Giardiello employed a custom-developed version of Filmic Pro to enable ACES-compliant recording of material at a higher bit-rate, generating low-compressed, 2048x1080, MPEG4 files. These were then converted to ProRes 4444 using Daylight, with time-code embedded.

"Of course, these days there is a pressure to get the live action and VFX shots turned around fast, not just for post production, but also for promotional trailers," says Giardiello. "So these new ways of transcoding material, combined with the wider range of ingest formats now available in Codex Vault, were a great advantage during production."

Also helping to expedite production, Vault S was used to playback takes on-set, not just for McGarvey and Espinosa's review, but also to QC the footage for focus, and unwanted image flares, as well as possible dead pixels and dust on the camera sensors. In the case of the ALEXA 65, the ability to playback processed 4K material from the Codex Vault S, for review on a 4K monitor, enabled scrutiny at 1-1 pixel size.

Along with supervising the workflow, Giardiello also worked as the production's dailies colourist. "Whilst Codex are known for the safe transition of images and metadata from production into post, it was equally important to have a secure colour pipeline," he remarks.

He deployed Codex Live (which has reliable and simple controls to adjust a range of colour parameters, backed up

by a strong colour science engine) to fine-tune the looks of the ALEXA 65, ALEXA Mini and Codex Action Cam cameras in full ACES colour space. These on-set grades were exported as ASC-CDLs, and then imported and embedded as metadata within each ARRIRAW file through the Vault S on-set.

The non-ARRI cameras, capable of streaming a video feed from the camera body, had their signals converted on-set to an ACES-compliant colour space/gamma using custom input transforms created by Peter Doyle and the colour science team at Technicolor.

Once converted to Apple ProRes 4444, these files, along with the ones that could not be viewed in real-time on set (i.e. GoPro), were ingested into the on-set Codex Vault S, where Davis applied the CDL along with other metadata. After that, an ALE file was generated, which became a sidecar file for the master clips that were unable to store metadata inside their file headers. Those ALEs were then used by Pinewood Post to acquire essential metadata and CDL values.

"This process didn't only streamline the post production for the unusual formats we were managing, but it also made those contents virtually identical to the ARRIRAW files," says Giardiello. "Once footage had been converted downstream to OpenEXR for the DI and VFX, there was no difference in colour space, resolution, filename or metadata structure between each camera format. The crucial thing was that, thanks to Codex's workflow control and integration, the looks that Seamus created on-set were exactly as what appeared in the VFX and editorial deliverables, and in the DI grading suite."

Whilst only circle takes were stored on the near-set Vault S, all the footage was delivered to Pinewood Post: "As Pinewood Post is located so close to where we were shooting, we did not need to make clone copies on-set. It took very little time to transfer the assets," he notes.

To even-out the workload, Davis performed a rushes split,

"I HAVE USED CODEX EVERY SINGLE DAY OF MY WORKING LIFE SINCE 2010, AND CAN GENUINELY SAY THAT YOU CAN TRUST IT, IT WORKS"

Francesco Giardiello

whereby rushes were transferred from the set to Pinewood Post twice a day – once in the early afternoon, and then again when production wrapped every day.

With the *Life* experience now under his belt, Giardiello is currently working on *Jurassic World II*, directed by JA Bayona, and shot by Oscar Faura, scheduled for release in 2018, with Codex Vault once again the foundation stone of the workflow.

"When I am working on a big project, Codex Vault is always my #1 system," Giardiello concludes. "As per normal its performance on *Life* was amazing, and when I needed any technical support, that was equally good. All of this gives you and your team a lot of confidence in a high-pressure environment."



AMATTER OF LIFE AND DEATH

Seamus McGarvey BSC ASC brings to life an extra-terrestrial sci-fi thriller. Whilst his private passions for astronomy, space and manned space travel were amongst the lures for Seamus McGarvey and his cinematographic attraction to Daniel Espinosa's sci-fi thriller *Life*, he was under no illusions as to the creative and technical challenges he would meet in bringing the script to fruition on the big screen.

Sony Pictures Entertainment's \$80m production focuses on the crew aboard the International Space Station (ISS) who encounter the first proof of extra-terrestrial life in a capsule returning from Mars. However, the seemingly benign organism, nicknamed 'Calvin', proves to be a lethal adversary, threatening not just the crew but life on Earth.

"I loved how taut and tense the script was – a rich seam of human emotions distilled into a pressure-cooker environment," says McGarvey. But I was highly aware of the challenges regarding the photography, lighting and camera movement – given the limitations of size and space within our ISS sets – as well as the task of visually creating the impression of zero gravity."

The production of *Life* was based at Shepperton Studios, UK, where multiple ISS-replica sets were built on the H and R

— ● —
**"LIFE IS THE MOST INTENSE
AND TECHNICAL PRODUCTION I
HAVE EVER WORKED ON"**
— ● —

Seamus McGarvey BSC ASC

Stages. Two short additional shoots were conducted at ABC's 'Good Morning America' studios in New York, and on the backlot at Pinewood Studios.

McGarvey says that initially Espinosa was keen to shoot *Life* on 35mm, but he convinced his director that, because of the

low-light levels on-set, plus the cramped and awkward ISS sets, a more compact, digital camera package would be the most practicable solution.

"Although I had tested the ARRI ALEXA 65, I never used the camera system on a production before," explains McGarvey. "I was attracted to the ALEXA 65, not for what it's known for – epic landscapes and wide vistas – but for how the sensor mimics medium-format photography – its depth-of-field, the lovely way it records skin tones, and the fall-off on faces. It is a great portraiture format, with minimal distortion, backed-up by fantastic colour science from ARRI and Codex's efficient camera-to-post workflow."

McGarvey opted for ARRI Prime 65 lenses, incorporating Hasselblad glass, as the high-performance optics would enable him to use wide lenses without the same distortion produced

by a camera with a smaller sensor, while delivering a forgiving photographic outcome. McGarvey framed *Life* in 2.39:1, rather than 1.85:1, as along with using the format for portraiture, the wider aspect ratio would enable him to place faces at the edge of frame, and use the empty spaces of the picture to create a dramatic, edge-of-the-seat darkness.

ALEXA 65 was the main camera on first and second units. ALEXA Minis, fitted with Primos, were used as B-cameras on both units. Both the Prime 65s and Primos feature Lens Data Systems, which allow frame-accurate metadata about focus, iris and zoom settings to be recorded within the uncompressed ARRIRAW image stream. This metadata and the pictures passed from the in-camera Codex SXR Capture Drives (used with the ALEXA 65s) and CF2 cards (used with the ALEXA Minis) to a near-set Codex Vault S, before being processed through Pinewood Post for the editorial and VFX post production teams.

McGarvey also shot other sequences – such as Calvin POV shots through air vents, plus the innards of the ISS – using Codex Action Cam and Flare 4K SDI cameras. He even used an Apple iPhone 6s for various VOIP call scenes between the ISS crew and Earth. All of these camera rushes went through the Codex Vault too, under the auspices of the on-set DITs: Francesco Giardiello on H-Stage – who helped establish a full ACES pipeline on the production, performed on-set grading with Codex Live, and who McGarvey describes as a “key cohort” in the cinematographic workflow; and Sean Leonard on R-stage. Data wrangler Christine Davis supervised the passage of the digital negative to Pinewood Post, based at Shepperton Studios, which performed the ALEXA 65 processing, data cloning and image QC using Vault XL, before creating of the editorial/VFX deliverables.

During prep McGarvey immersed himself in the practical logistics of the lighting of the ISS sets with production designer Nigel Phelps, supervising art director Marc Homes, prop master Barry Gibbs and gaffer Lee Walters. Because of the restricted space – such as the astronauts’ sleeping pods and narrow 40ft-long connecting tunnels – the interior lighting of the ISS had to be integrated into the sets. Along with the in-camera practical lights, Walters designed an array of bespoke LED lights – low-profile, diffused, linear and circular boxes – using ribbon strips, which were all carefully positioned or concealed. McGarvey’s enterprising gaffer also devised a small hand-held LED pad that could be used beside the camera to provide gentle, diffused fill on the actors’ faces. All of these lights were wired to a dimmer board, controlled from an iPad, to allow the relationship of the lights to be adjusted as required by the scene and time of day.

To emulate the effect of direct sunlight, and the sharp shadows it creates in space, McGarvey hit with actors and sets with a direct beam of light from a K5600 Alpha 18K. To create the ambient bounce of light coming from Earth, ARRI SkyPanels were arranged as large soft boxes, with silks and double egg crates to channel the throw of the light. These fixtures could be also changed within seconds from cool daylight to blue/green moonlight settings, making the lighting set-ups fast and organic.

Whilst the lighting requirement proved one challenge, creating

“IT IS A GREAT PORTRAITURE FORMAT, WITH MINIMAL DISTORTION, BACKED-UP BY FANTASTIC COLOUR SCIENCE FROM ARRI AND CODEX’S EFFICIENT CAMERA-TO-POST WORKFLOW.”

Seamus McGarvey BSC ASC

a feeling of weightlessness was quite another. Various solutions lay in suspending the actors from vertical wires (painted out in post) that fitted through a small channel in the roof of the tunnel sets, with the camera travelling on the end of a telescopic crane arm in coordination with the action. At other moments the actors were inverted on wires, facing head-down towards the camera, or strapped into tuning forks. Occasionally the actors rode a platform on a GF-8 jib arm, moved subtly to create the feeling of zero gravity. At other times, the actors were seated on large yoga exercise balls, kept discretely out of frame, and used their performance skills to create the appropriate appearance of weightlessness. One set of the crew’s sleeping quarters was built on a gimbal, which could be pivoted around an axis to allow for different configurations of wire-manipulations of the actors, to helping them to float in and out of their sleeping pods.



During production, Peter Robertson operated A-camera on H-Stage, with Alan Hall as the A-camera first AC. Iain Struthers was B-camera operator, with Olly Tellett as B-camera first AC. The R-stage unit DP and camera operator was Carlos De Carvalho, with Paul Wheeldon his first AC.

To expedite production, two camera units often ran side-by-side on Shepperton’s H and R stages. Typically, R-Stage DP/operator De Carvalho would rehearse and prep the complex stunt and wire moves, whilst McGarvey and Espinosa were shooting on H Stage. When their shoot on H Stage was complete, the pair would then shuttle across to R stage, leaving H stage ready for the next set-ups.

“We were never idle and this way of production proved very efficient,” says McGarvey. “I have known Carlos for 20 years and it was such a bonus to have his great eye and expertise on this feature. Lee, Gary and I were always migrating between the two stages, jumping between lighting and shooting and vice versa.”

McGarvey concludes, “*Life* is the most intense and technical production I have ever worked on – setting-up the constructed environments, preparing the cameras, the lighting, the stunts and weightless choreography – as so much of the technology and the techniques were new to us. I hope that, like me, audiences will feel that *Life* is a poignant, cautionary tale about how we treat one another.”



SUCCESS STORY: THE CALLING
CINEMATOGRAPHER: RUSSELL CARPENTER ASC
RELEASE: 2016



EXPLORING THE LIGHT

Tyler Stableford and Russell Carpenter ASC
on their collaboration for *The Calling*

As Canon developed the Canon Cinema EOS C700 camera, they naturally turned to Codex, the leading manufacturer of recording technology, media and workflow for digital cinematography. Over the course of 2016, Codex worked closely with Canon as they rolled out the C700, including collaborating on the first short film to be shot with it – *The Calling*.



Directed by Canon Explorer of Light Tyler Stableford and shot by cinematographer Russell Carpenter ASC (*Titanic*, *Charlie's Angels*, *Ant-Man*), *The Calling* profiles three people pursuing their dreams in Western Colorado and paired Tyler and Russell up for the first time. It was filmed around Tyler's hometown – Carbondale, Colorado – over a few days in October 2016. We recently had the chance to catch up with Tyler and Russell and find out more about their collaboration on this project.

Tyler, tell us about working with Russell? When did you first get together with him to start planning the shoot?

I really adored working with Russell. He is a dear-hearted man, with such a detailed eye for lighting, framing, and motion. We connected two weeks prior to shooting *The Calling* for the director's scout. I hadn't met him before; he was relatively quiet during our scout, taking all the information in, listening attentively. That quietness transformed to spirited action during our tech scout just prior to the shoot, with a great series of inspirations and plans that he developed from all of our research. It was really fun to witness!

When Canon first approached you about this project, did you immediately have an idea of what you wanted to shoot?

Our producer Steve Tobenkin called and invited me to partner with him on the pitch for this film; and really the idea for the film was entirely his – he suggested we feature the real life characters of a cowboy, a distiller and a rock climber here in my hometown of Carbondale, Colorado. He had worked on a project with me here a couple of years ago, and loved the people and scenery of western Colorado. We discussed other possible characters, anything that might be cinematic and show craftsmanship, and we landed right back with his original ideas, as these really seemed to be the best fits. From there, I began writing the script, and Steve and I edited it and condensed it to its final iteration.

Were you aware of Codex before this project?

I feel silly admitting that I was not aware of Codex before this project. But boy was I impressed with both the technology and the people who stand behind Codex! In truth, the Codex crew were always the smartest people in the room during our shoot. We were working with two production sample C700 cameras, really the only two cameras in the U.S. at the time, with no user manuals – so much of what Codex was helping us with was honing in on the potential looks, and really pushing and testing the imaging capabilities of the C700. All of which we found to be very impressive with the 12-bit RAW recording!

How about you Russell? What was your experience with Codex prior to shooting *The Calling*?

I'd had uneven experiences before shooting with other companies providing digital RAW recorders, mainly because the recorders were not attached directly to the camera body and connections between the camera and the recorder were not robust enough for feature films to facilitate uninterrupted recording with no "drop outs". This was frustrating, but it was heartening that Codex addressed these problems with the camera manufacturers and developed a completely dependable system, whether the recorder was onboard or separate. I first

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Russell Carpenter ASC



realised this on *Ant-Man* for Marvel Studios when I used ALEXA XT cameras with Codex recording inside.

How involved were you with the workflow Tyler? Did you view dailies in the production van?

As director I was not intimately involved with the digital workflow, as I simply didn't have the time during the long shoot days to spend more than a few minutes at a time in the workflow van. That said, I certainly kept a close eye as often as I could, providing input wherever it was helpful – but really Russell oversaw the workflow with Brian Gaffney and Chris Chrisenberg from Codex.

Russell, what is your approach to dailies? Do you grade your dailies or just use LUTs?

I tend to use just one or two LUTs and create my imagery around those. As in the film days, I find that if the dailies are

being graded each day for me, I may get a bit lost or not see when I'm getting into trouble with my exposures. So I keep it simple!

And do you use a DIT on-set? Tell us about your relationship with your DIT? What do you rely on him/her for?

In a feature situation, I converse with the DIT all the time, as we've worked out LUTs in pre-production and he or she knows the intended look of the film very well. We are always discussing the shadows and highlights and the colour balance, determining what we might want to let go of in the exposure extremes and what we will want to make sure we retain. However, there are often situations on action films where my operators are going "free range"... I really like the idea that when operating the C700, the operator can use the "in eyepiece" waveform monitor to immediately switch between the chosen LUT and Canon Log to make critical exposure decisions.

How important is a solid workflow to you when you're choosing a camera? Or is it all about the image?

For me, it's all about the image - but having a rock-solid workflow is critical to achieving that end. With the advent of digital cinematography, so many people have been working so hard to develop methodologies that ensure the artistry of everyone participating endures from capture to presentation. It's so important that the different components of image capture co-ordinate well together... and it's good to see that Canon and Codex have worked together to make that happen.

What were your thoughts when you saw the images on the big screen at SHED?

I was very happy with the Canon C700/Codex combination because of the way subtle nuance was rendered in the faces of the people we photographed. I still think the most important thing any camera can do is see the subtleties in the "facial landscape".

Tyler, do you have plans to use the C700 again?

Yes! I am working on a potential short film featuring ski patrollers doing avalanche control work at 12,000 feet, where the latitude of the C700 will be a real boon in the challenging natural light. I am also eager to use it for upcoming TV commercial work - so much of my outdoor cinematography involves heavily backlight scenes at sunrise and sunset, with fast-moving setups and relatively small lighting kits; in these situations, having the latitude of the C700 with Codex RAW recording is a huge asset for both holding the highlight and shadow information, as well as bringing up subtle shadow details in the colour grade when needed. This can really save us lighting time on-set.

And Russell, why should someone choose to shoot with the C700, given all the camera choices available today?

I think the most immediate reason to shoot with the C700 is that it's a 4K camera in a very production friendly package that when paired with the Codex recorder, provides a 15 stop latitude, great colour space, in a very robust system that provides feature quality imagery in a combat-tough camera package.

SUCCESS STORY: KONG: SKULL ISLAND
CINEMATOGRAPHER: LARRY FONG ASC
RELEASE: 2017



KING KONG GETS A 70'S LOOK

Boyhood dreams become reality for Larry Fong ASC

When Larry Fong ASC read the script for *Kong: Skull Island*, he thought he might be the cinematographer for the job. Of course, the opportunity to make a film with the progenitor of all movie monsters was appealing from a career standpoint, but for Fong, the thrill was also personal, as he grew up as a superfan of the tragic simian. In high school, he had a shelf full of books about Kong, beginning with "The Making of King Kong," by Orville Goldner and George Turner, which is the standard reference. He studied the visual effects techniques used by pioneer Willis O'Brien, and his first attempts at filmmaking featured stop motion animation, ball-socket armatures, clay sculptures, and rear projection.

"I made my dad take me to the theatre whenever *King Kong* was playing," says Fong. "I'd force my friends to watch the original 1933 *King Kong*."

In fact, during this period, Fong read in the Los Angeles Times that the 1976 Dino E. Laurentis *Kong*, starring Jessica Lange, Charles Grodin and Jeff Bridges, would be paying tribute to the hairy protagonist, with the robot from the film production

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**"IT WAS IMPORTANT
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Larry Fong ASC

performing impressive feats. Fong convinced his dad to take him, but it turned out to be a thinly veiled excuse for gathering extras for the scene in which Kong escapes from his cage. Fong's enthusiasm was undimmed.

"We sat there all night long, and nothing happened for hours and hours," says Fong. "There was a problem with the robot and all it did was twitch its pinkie. My dad said that we had to leave, and I begged him to stay. In the film, there are a couple of seconds from that night, surrounded by shots made by Rick Baker."

Fast-forward several decades, and Fong is now a freshly minted member of the American Society of Cinematographers with credits like *300*, *Watchmen*, *Super 8*, and *Batman v Superman: Dawn of Justice*.

"When I realised that the Skull Island script was a King Kong story, it all came flooding back," he says. "It freaked me out, I have to say, to know that I'd be part of that long lineage."

The next question for Fong and director Jordan Vogt-Roberts was how to put their own spin on the tale. *Kong: Skull Island* is set in the 1970s, and the initial look they devised referenced 70s classics like *Apocalypse Now* as a springboard. The look evolved from there. Film buffs will notice echoes of 70s-vintage films in the script and characters as well.

"It's a blockbuster, popcorn kind of movie, and a pop culture mash-up to some degree," says Fong. "We tried to take an artistic approach while making it accessible to audiences all over the world."

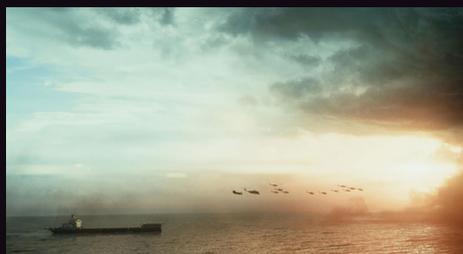
Fong is known in cinematography circles for shooting film, but in this case he opted for digital, which he has used throughout his career on commercials and television projects. Still, a film aesthetic was the goal, so Fong chose the anamorphic format and used lenses engineered to his specs by Panavision's Dan Sasaki.

"We didn't want to create classic anamorphic flare," he says. "We went for a warmer flare and different look. Dan basically combined new and old glass into a unique hybrid lens."

The cameras were ARRI ALEXA XTs using Codex Capture Drives.

DIT Robert Howie was aware that *Kong: Skull Island* was Fong's first feature on digital. "Larry has shot huge movies on film, and could have very easily done this without me," says Howie. "Even though he has shot tons of digital, he hadn't used it as the primary format on one of his features. So it was my job to support him wherever he needed it. My goal was to give him all the extra tools that digital has to offer and let him choose what would help him in his process."

"Dan Sasaki told us that the 2x anamorphic glass was designed more for the 4x3 sensor setting than for the extended FOV



OpenGate format," says Howie. "So we shot 4x3 FULL mode to give some extra room on the sides for visual effects and other adjustments. It was important to know we could go up to 90 frames per second in that mode and still get the FULL quality of the sensor using Codex recording. I pre-made all the user setup files for the camera assistants so that they could switch between different sensor modes without having to do a



"I WAS FAMILIAR WITH THE ALEXA-CODEX WORKFLOW FROM PREVIOUS SHOTS... THE ONLY DIFFERENCE WAS USING IT THEATRICALY. IT WAS SMOOTHER THAT I COULD HAVE IMAGINED – SMOOTH AS SILK, IN FACT"

Larry Fong ASC

complete re-initialising of all the settings, since sometimes we needed to go OpenGate Spherical for visual effects."

The jungle portion of the shoot unfolded in Hawaii, where Fong has previous experience on *Last*, and in Vietnam. Fong found the right DIT in Howie, who came with a reputation for mobility. The duo worked up a couple of LUTs beforehand that "made things look interesting without making them look bizarre," according to Fong. A special 5219 film emulation LUT designed by Steve Yedlin ASC simplified things.

"Larry and I specifically focused on the locations in prep," says Howie. "We had very little stage work, so everything needed to be compact and adjusted to run completely off 24- or 12-volt systems if needed. My full systems with OLED displays and modified smaller packs allowed us to move from mountain tops to boat work. After talks with the folks at Legendary, we decided Codex Vault would allow for the simplest, quick and secure on-set copy process. After the on-set copy was made, the Codex Capture Drives were a perfect shuttle solution over to FotoKem and the NextLab team."

Howie points out three reasons the Vault was the right choice: "One is Vault's unique ability to handle all the formats and run quick offloads," he says. "Second, the secure format made the studio happy knowing that the media wasn't simply accessible to anyone who got their hands on it. And third is the amazing support that Codex is able to supply. This gave all of us confidence that in our hard-to-work locations and weather we would not be left in the cold."

Fong, whose love for *King Kong* and admiration for his creators has come full circle, says that technically, the shoot went well. "I was familiar with the ALEXA-CODEX workflow from previous shoots," he says. "The only difference was using it theatrically. It was smoother that I could have imagined – smooth as silk, in fact."



CAPTURED ON
CODEX

MARVEL CONTEST A CINEMATIC FUTURE

Guardians of the Galaxy Vol. 2, Marvel's latest 8K superhero extravaganza shot in RED 8K.

Guardians of the Galaxy Vol. 2, Marvel's latest superhero extravaganza, hit theaters in May of 2017. According to director James Gunn and cinematographer Henry Braham BSC, audiences are in for a unique visual experience. Gunn has been quoted on Facebook as saying, "I'm interested in being one of the many who help to create a new kind of magic that will usher the cinematic experience into the future."

Gunn recruited Henry Braham BSC, the cinematographer behind *The Golden Compass* and *The Legend of Tarzan*, to serve as director of photography. In testing, the filmmakers found the imagery that best served their lofty goals was delivered by the RED WEAPON 8K, a camera that was still in its infancy at the time.

"We were looking for a great, big-screen theatrical experience," says Braham. "It's a very visual movie, with rich, fantastical and complex imagery. I really liked the 8K because of the depth of the image, the intensity you get with it. The quality is astounding."

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**"CODEX HAS BECOME
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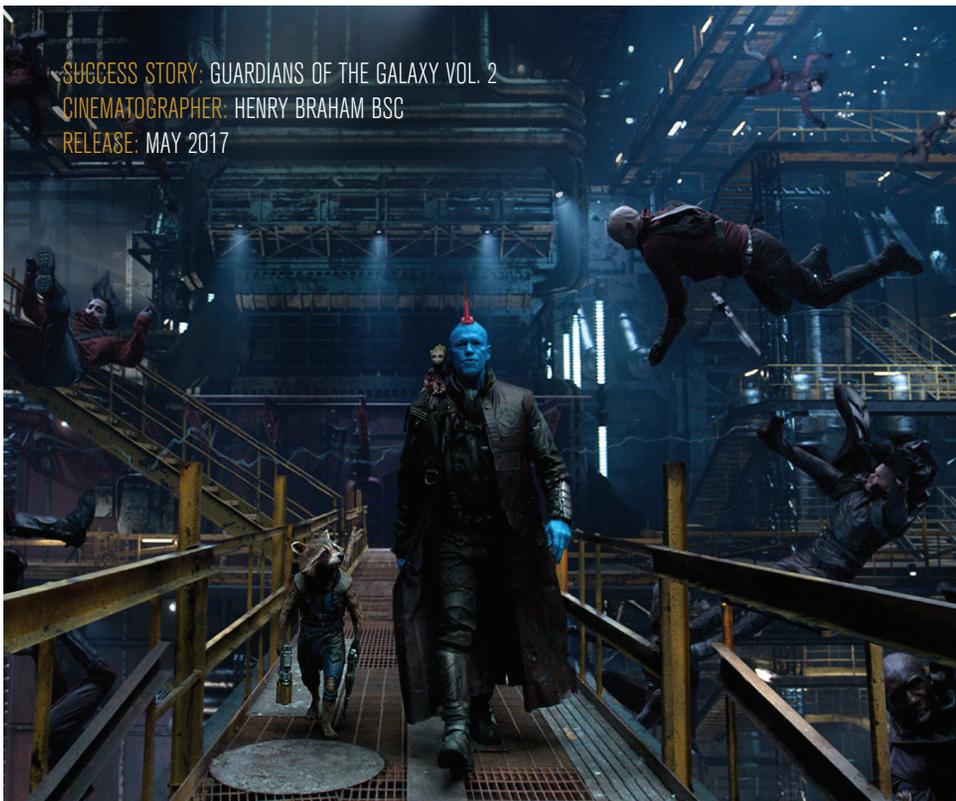
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Jesse Torres
VP Post Production at Marvel

Gunn says that the RED WEAPON 8K gives him control and freedom in post, as well as the ability to shoot very long takes, better allowing him to capture the "energy and rawness" in a performance. And he believes that new technologies will lead to "a new aesthetic of film, one different from what the past has offered, but equally beautiful – perhaps even more so."

Braham shot an early digital feature, *Flyboys*, in 2005, and describes himself as having been "cynical" about the importance of resolution. "I'm not sure I could really tell the difference between 2K and 4K," he says. "But when we shot the *Legend of Tarzan* at 6K, there was a significant difference between 4K and 6K. With *Guardians*, 8K really stood out. I've changed my view on this. It's a very engaging image to look at. It almost has an added dimension because of the amount of detail in the texture. I really think this is a beautiful new aesthetic in filmmaking."

Before committing to a brand new format, many questions



SUCCESS STORY: GUARDIANS OF THE GALAXY VOL. 2
CINEMATOGRAPHER: HENRY BRAHAM BSC
RELEASE: MAY 2017



needed to be answered, not the least of which was how to handle the massive amounts of data. Three months of testing allowed Braham to work with RED to tune the camera and make it ready for the realities of production. SHED, the creative finishing boutique with offices in London, Santa Monica and Atlanta, designed a solid, efficient workflow based in part on experience with ALEXA 65 and RED DRAGON 6K on films like *Captain America: Civil War*.

The size of the full 8K frame is 8192 x 4320 pixels, and the RED WEAPON can capture 8K resolution at up to 75 frames per second. With multiple cameras, the amount of REDCODE RAW data generated by the production was estimated to be more than 230 terabytes.

SHED specified an entirely Codex-based workflow from on-set through post, VFX pulls and archiving. The procedure involved loading 1 TB RED MINI-MAGs into a Codex S-Series Vault near the set. After a check, the data was cloned to an 8 TB Codex Transfer Drive. A pair of Codex XL-Series Vaults at SHED Atlanta then processed the R3D RAW files with LUTs applied and rendered all the necessary deliverables through Codex Production Suite. ACES was also used to manage the colour and ensure consistency.

The original 8K camera data, including metadata such as the camera gyro and accelerometer data and any white balance changes, were tracked and updated along with the editorial ALE files and tied together using Codex Backbone, which provides reports and facilitates the flow of information. Codex Backbone is also being used to manage and provide all VFX pulls from the database created automatically during production.

Marvel has worked closely with Codex throughout its extraordinary run of success. Jesse Torres, VP Post Production at Marvel, says, "Codex has become our standard for digital productions and was the natural choice to facilitate the flow of data from set-to-post. Codex Vault is extremely robust. We can trust that our post partner SHED will be able to use the system with no issues. By choosing Codex, we can be completely confident that our data is not only secure, but delivered on time to whomever needs it."

Braham is pleased with the results. "From an audience point of view, it's really exciting to look at," he says. "It almost has a slight 3D quality, but in a very pleasing way. I think that's a reason to go and see a movie in as high a resolution as possible. It bodes well for the future of filmmaking, the business side included. It's an exciting time to be photographing movies. These formats are changing fast, and they're really good. They are what you make of them – if you're fearful, you might not have such a good experience. But if you embrace them and make them work for you, they're fantastic."





CAPTURED ON
CODEX

WOMAN AND MACHINE BECOME ONE

Jess Hall BSC paints
a near future cyber
world with live action in
Ghost in the Shell

SUCCESS STORY: GHOST IN THE SHELL
CINEMATOGRAPHER: RUPERT SANDERS
RELEASE: 2017



Rupert Sanders made a bold opening move with the visually elegant *Snow White and the Huntsman*. Sanders's feature debut was photographed by Greig Fraser ASC ACS, who made extensive use of film emulsion on the project, including a significant number of scenes shot in 65mm film format. For his second feature, *Ghost in the Shell*, Sanders has teamed with Jess Hall BSC, whose resume includes a number of distinctive features shot on film, including *Transcendence*, *The Spectacular Now*, *Creation* and *Brideshead Revisited*. This time around, however, Sanders and Hall settled on an approach that combined large format digital cinematography, distinctive lenses, and a very controlled approach to colour.

Based on the internationally acclaimed Japanese Manga, "The Ghost in the Shell", the movie stars Scarlett Johansson as Major. She's the first of her kind – a cyber-enhanced soldier designed to stop the worst criminals and terrorists. Originally a human, during the course of the movie she relentlessly tries to recover her past, find out who transformed her and stop them from doing it to others. The production worked mostly in Hong Kong and at Stone Street Studios in New Zealand.

"We were looking for imagery that paid homage to the visual quality of the anime, but that also worked for what we were doing – a movie," says Hall. "The large format came out of our



need for something subtle and sophisticated enough to rival film in terms of colour reproduction, and the spatial resolution to work with all the different distribution types."

Hall compared the colour, patina and texture of the source material to watercolor painting. He exerted an unprecedented degree of control over colour, working with lighting manufacturers to develop customised lighting tools, and often "timing" the movie on the set by manipulating the output of LED fixtures. He also collaborated closely with Panavision to tailor the Sphero 65 lenses.

"In manga, there's a certain painterly quality as well as a certain kind of bloom or halation around highlights," he says. "At the same time, I needed very high speed and high performance lenses, because we planned to shoot in Hong Kong at night using a lot of available lighting. The correct perspective – flatter, and wide angle, with a wide field of view but without distortion – was important so I asked Dan Sasaki at Panavision to build a 29mm that could accommodate the 65mm format. This lens, the only one of its type in the world, became a very effective lens for us."

In the bigger format, the 29mm is roughly equivalent to a 19mm in 35mm. The ARRI ALEXA 65 was set to capture data at a rate closer to 5K, which saved about a third on data wrangling and associated costs.

"We originally thought we'd shoot certain scenes on the 65, but once we started testing, it felt like we wanted to shoot 90% of the movie that way," says Hall. "So my idea was to shoot in 5-perf 65 mode, which records in 1.78:1. I wanted to frame in



SUCCESS STORY: LOGAN
CINEMATOGRAPHER: JOHN MATHIESON BSC
RELEASE: MAY 2017

TRUE CINEMATIC GRIT

John Mathieson BSC creates a rough and real look for *Logan*

The Wolverine character made his big-screen debut almost 17 years ago, in the 2000 Marvel flick, *X-Men*. Back then, the wave of comic-book-inspired, visual-effects-heavy feature films was just gaining momentum. Since then, no fewer than 40 feature films have been produced with Marvel characters, and comic book-themed movies are a mainstay of the industry.

For that reason among others, director James Mangold and director of photography John Mathieson BSC avoided a formulaic approach to the visuals on *Logan*, the latest entry in Wolverine's cinematic adventures. Rather than a perfectly designed world where a slightly campy superhero clad in tights and a mask emerges from earth-shattering explosions with nary a mote of dust, *Logan* takes place in a recognisably grungy and gritty world.

"It wasn't as though I'd made a conscious decision to make it look grubby," says Mathieson, (*The Man from U.N.C.L.E.*, *X-Men: First Class*, *Gladiator*). "That's the way the characters were written on the page. Our heroes live in a disused factory surrounded by toxic, rusting things. One character is sickly and anaemic and can't go outside. Charles is a bumbling,



cantankerous old man who lives with a terribly obnoxious drunk – the washed-up Logan. Rather than boldly looking for a global crisis to fight through, they are in hiding. It's not a glamorous film. It's rough and real, and you feel the dirt and grit.

With that in mind, the production ventured out to actual locations for major parts of the shoot, keeping with the real-world aesthetic. Louisiana, Mississippi, and New Mexico served as backdrops. The story unfolds mainly in exterior situations, which meant that Mathieson could depend on natural light in many cases. He often pushed exposure to create photography that communicated a sense of the heat and dust.

"I was really trying to shove it somewhere so that when we went out in the desert, you felt how it was to be in the sun," says Mathieson. "James wanted to feel the searing heat of the desert. We didn't want the lovely, soft golden colours of *Lawrence of Arabia*, but rather hot, hard, horrible sun, to convey that these people live somewhere they don't want to. This film does have plenty of texture. You feel you're on the road. These characters are running."

Mathieson says that Mangold's instincts in terms of framing harkened back to classic road movies of 1970s American cinema, like *Two-Lane Blacktop*, and *Thunderbolt and Lightfoot*.

"The American landscapes were great for me, he says. I've never really lit exteriors, but that's true for this film in particular. I did have some matching, and the skies were always changing in New Mexico. But setting up a nice, big 40x40 silk with a crane, making it nicely soft underneath, and then relighting – I'm so fed up with that. And it wasn't right for this film. If someone was in shadow and they stepped out into the sun, let

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**"THIS FILM HAS PLENTY
OF TEXTURE. YOU FEEL
YOU'RE ON THE ROAD
WITH THE CHARACTERS
RUNNING"**
— ● —

John Mathieson BSC



them. That's it – because James made them real people and they are in a real situation, and that's what it's like. Your eyes wince and you can't see a damn thing. You have that high desert contrast and spectacular light. That's not something we see in Scotland!"

There were some visual effects, but most of the fights were done traditionally, in camera. Mangold prefers to use a single camera whenever possible, often in the middle range of focal lengths. The cameras were ARRI ALEXA XTs in 4:3 and Open Gate mode, with internal Codex recording set to ARRIRAW format. An ALEXA Mini was also on hand, and the lenses were Panavision E-Series anamorphic as well as two Panavision anamorphic zooms. Some spherical lenses were used for visual effects elements. Footage designed to represent cell phone video was captured with smaller Canon and Blackmagic cameras.

Mathieson worked with Technicolor for the post portion of the job, as is his custom. On set, the digital imaging technician was Daniele Colombera. Regarding colour, Mathieson says, it's certainly a colourful film, but I don't want to introduce colour from the box or the DI. It has to be in the design, something you can get a hold of. I don't even like to enhance things. I want people to feel like this is a real place with real people. If you start to enhance something, people stop believing it. You push people outside the story. I wanted to give James images he liked, without fiddling too much on the set or later. You want the director and editor to like and feel the mood of the images."

The washed-up *Logan* nevertheless elicits empathy. Through its first three months of release, the film is the third-highest gross at the 2017 box office, having multiplied its reported \$97 million budget by six.





CAPTURED ON
CODEX

GRIT

ON THE ROAD

DIT Daniele Colombera experienced a new and gritty approach to the Wolverine franchise.



Before DIT Daniele Colombera had the chance to meet with John Mathieson BSC, to discuss Logan, he assumed that like previous instalments of the *Wolverine* franchise, the assignment would entail significant CGI and be shot mostly under controlled conditions on soundstages.

"When I met with John, I discovered that it was going to be a film on the road, filmed in real locations, and that was a nice surprise," he says. "John's no-frills approach was a breath of fresh air, designed to capture the locations and the rawness of the story without bringing in a Hollywood blockbuster look. I thought John's plan was clever – to avoid artificial and sometime fragile light, and to work instead with negative fill and silks to sculpt the light we encountered at each location, with an emphasis on feeling the strong emotions of the characters. And it shows."

The first night of shoot in New Mexico, the filmmakers wondered whether they had made the right decision. They were subjected to a blinding New Mexico sandstorm that destroyed most of the tents. But they kept shooting, and that footage appears in the final edit. That night set the tone for the entire shoot. Luckily, Colombera's igloo-shaped DIT tent survived, with the help of three crew members holding it down with sandbags. "Blasts of hot, sandy air leaked into the tent, but John kept his British aplomb, and we got the shots," says Colombera.

Generally, conditions were not quite that extreme. But the majority of the film was done at night or in hot, desert exteriors. "John's goal was to convey the uncomfortable experience of being in the desert," says Colombera. "That meant a hot exposure, but my role was also to make sure we didn't clip the highlights, and to optimise the exposure within the dynamic range of the camera. We were embracing nature without going against the nature of the camera. We were not shy about working in the upper level of the exposure. With the ALEXA, you can count on a smooth roll-off in the highlights, so it's cinematic and there's still information there that can be used in post and CGI."

— ● —
**"ONE OF THE THINGS
CODEX DOES RIGHT
IS TO MAKE IT
ABOUT EFFICIENCY...
DOWNLOADING DOESN'T
REQUIRE HOURS – IT
REQUIRES MINUTES"**
— ● —

Daniele Colombera



All the ALEXA ARRIRAW footage went through a pipeline designed by Colombera that included software he helped develop – Colorfront On-Set Live, the backbone of the Technicolor's DP Lights 2 grading system. Express Metadata Dailies files included all camera metadata, ASC-CDL values, and uncompressed stills. The system allows him to see, share and send uncompressed still images with the grade applied on a shot-by-shot basis, which shows exactly Mathieson's intent down the line.

"At the lab, the dailies operator could see exactly and compare CDL values and graded reference stills, which is great, because after a 16-hour day, the last thing you want when you get back to the hotel is a phone call from the lab about intentions," says Colombera. "At some locations in New Mexico, we were pretty much off the grid."

The script also called for some imagery captured furtively with a mobile phone camera. After testing, the filmmakers chose to shoot with a Canon FS20, a standard-definition consumer-grade camera. Other shots in the sequence required visual effects, and these were done with a Black Magic Pocket Cinema Camera and re-photographed with the Canon.

"John really wanted to feel the graininess and the realism," says Colombera. "He wanted all those elements that make the images look amateur – chasing focus, erratic zooms, extended depth of field, auto-exposure and white balance. Normally, you shoot this kind of content with a professional camera, and then adapt it the way you want in post, but John didn't want to cut corners. It looks great on the big screen, and even the VFX supervisor loved the effect."

Colombera prefers to use Codex Vault on every project. Lately, that has included *Deepwater Horizon*, with director of photography Enrique Chediak ASC.

"One of the things Codex does right is to make it about efficiency," he says. "Downloading doesn't require hours – it requires minutes. Nobody wants a two-hour download at the end of a long day – not the data manager, not the transportation captain, not the producer. It's a domino effect. The generator needs to keep running. Even the lab gets the footage later. Those are real, practical considerations, and they have a real effect on the bottom line. And any other system will take three times as long."

"I go with Codex Vault, in part out of respect for the crew," he says. "Everyone wants to go home at the end of a long day. But I also need to have a rock-solid, certified clone that was downloaded and QC'd with the Codex proprietary data workflow. And on this project as well as in others, my data manager left the camera truck at the same time as the rest of the camera department, or shortly thereafter. Nobody has to wait, and the time saved adds up over the course of the production."

On *Deepwater Horizon*, speed was of the essence. "We shot some ARRIRAW Open Gate and ALEXA 65 on that project," Colombera recalls. "Peter Berg is one of the fastest directors on the planet, so I thought the secret was to be fast. We had to be ready for any situation, with a lot of footage in a brief period of time. He does extensive coverage, often with long takes. We used the Vault, and we were able to send everything out very quickly and turn over the digital rolls. On a remote location, that's even more important."

About two months after release, *Logan* has earned half a billion dollars at the box office. Colombera is currently working on *Avengers: Infinity War*.





EMPIRE STATE OF MIND

Codex caught up with Nicholas Kay DIT, talking about
Passengers and an enviable filmography



New York based DIT Nicholas Kay is one of the most sought after DITs in the United States. Nick and his company, Frame Logic, have supported many feature films and TV shows shooting in New York, Atlanta, and around the world including *Passengers*, *Pirates of the Caribbean 5* (DIT Ted Viola), *Teenage Mutant Ninja Turtles I & II*, *Going in Style* (DIT Matt Selkirk), *New Years Eve*, *Gotham* (DIT Dan Brosnan), and *The Smurfs* to name just a few. He has recently also been involved in one of the first TV shows to shoot RAW with the Panasonic VariCam 35, *The OA* (DIT Matt Selkirk) for Netflix. Nick shares his background with us, along with his experience with Codex.

How did you get to where you are today? Did you go to film school?

I went to school at NYU for Film and TV Production. My classes were more about compositing and Maya/HDR lighting though. While everyone was fighting to do their thesis on 35mm, I got the F950 cameras that were used in *Star Wars Episode 3* and built a computer to capture direct to hard drive instead of going to tape. This was when PCI technology just hit 1.5ghz clock speeds, so the digital/computer world was just opening up and this process was cutting-edge. Plus 8 Digital provided the cameras and when they saw what I did they hired me in the engineering department. I became a DIT shortly after. Since I had technical hands-on knowledge of both camera imaging and computer imaging, it was a natural fit. Plus Panavision then purchased Plus 8, and after the transition I was involved with supporting early Genesis cameras there as well, from my work at Plus 8, which led me to work more in movies.

I started my company Frame Logic in 2008, because there were not a lot of DIT solutions at the time. Standards were still less regulated, so there was an early need to reproduce fine control, across multiple shooting units, with high precision. When media acquisition changed to file-based solutions, we were already very familiar and ready to support productions and their big data needs. So it was all based on necessity, and we were in the right place at the right time.

Do you have any mentors in the industry?

I was fortunate to be taught early camera engineering by Rob Strait when he was the engineer at Plus 8, then Panavision, in NYC. Now, interestingly, he also works with me, and Frame Logic. So we have a very unique and longstanding relationship, through the evolution of HD. Whereas my focus was more computer-based early on, Rob taught me camera shading and early HD standards and calibration.



I was also fortunate to start at the time when HD was first transitioning from film, and to have had the good fortune to have been "trained" by the film process also. It's a privilege to have both survived and grown from that time of film, as well as HD technology, which was extremely demanding. Thanks to the assistants at the time for putting up with me!

Also, my approach is to be neutral, and learn from each cinematographer on every job. About how they respond and see the image of the project, which is a great privilege and gift. I like to re-learn how to like, and hate, certain looks on a project, only to embrace them on the next. Thanks to the cinematographers for training my eyes and putting up with me over the years.

Where do you see yourself in five years?

I hope to keep doing what I'm currently doing, offering more services in the digital world, working in HDR, and 4K, and helping to create flexibility in scene-linear colour pipelines, and providing greater levels of production support, for ever more demanding jobs.

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"MY COMPANY, FRAME LOGIC, INVESTS IN CODEX BECAUSE IT IS A WORKFLOW SOLUTION PROVIDER. FOR YEARS NOW WE HAVE BEEN WORKING ON THE HEAVIEST DATA JOBS USING CODEX..."

— ● —

Nicholas Kay

When did you first come across Codex?

I first came across Codex probably back around 2009, I had some experience with early Vaults, but got more involved once the Onboard Recorder became available, which was a big game changer from shooting to tape. My comfort with computers really helped with the heavy lifting that early file-based workflows needed.

Tell us about your experience with a Codex workflow with the ALEXA 65.

My Codex experience with ALEXA 65 was great. *Passengers* was one of the first movies to be entirely shot with the ALEXA 65. Media management was handled like a conventional XT ARRIRAW job, essentially. We transferred and processed the ARRIRAW footage on-set on 2 Vault XLs, and sent high-speed



shuttle drives to the lab, like a normal shoot, but with 10GigE transfer stations in between. We averaged about 12TB a day, but we managed to wrap up within about an hour at the end of the day. It sped up things for the lab substantially by being able to start ingesting and working right away, and regulated our Capture Drive count to 20 2TB drives, since ingest and turnaround was quicker. This saved time and money for production. We ended up shooting about 800TB by the end of the show, so everything we could do to speed up the process was very helpful.

What about The OA? What's different and/or the same about the VariCam 35/Codex combination?

With *The OA*, shooting the first V-RAW job, we are using similar high-speed transfer stations as *Passengers*, and also breaking media to the lab conventionally on high-speed shuttles, but again shooting about 8-10TB a day. Even though the data rates are high, we are able to keep up with the media, and the new Codex docks are keeping up to speed very nicely. The DIT was Matt Selkirk, I know he had his hands full on that job, but I looks like it came out great, really nice job on his part.

Why did you decide to invest in Codex equipment yourself?

My company, Frame Logic, invests in Codex because it is a workflow solution provider. For years now we have been working on the heaviest data jobs using Codex, and we continue to find ways to make workflows more conventional for production and also manage hardware costs and data turnaround. By working with Codex and providing Codex solutions, we have better control regulating both budgets and efficiency, so it offers the best balance for production. We have a good number of DITs and DPs that use Frame Logic for their preference of precise imaging and high-speed data transfer solutions, and we are privileged that productions and crew continue to trust us with their image.

To learn more about Nick and his company Frame Logic, visit: www.framelogicdigital.com

TICKETTORIDE



Prieto's Pristine Imagery Takes *Passengers* to the Future

On two recent projects for Martin Scorsese, Rodrigo Prieto ASC AMC was taking viewers to the past. The pilot for *Vinyl* took place in the 1970s, and *Silence*, a feature film about missionaries in Japan, is set in the 17th Century. After those two projects, Prieto turned his eye to the future. *Passengers* takes place on the Starship Avalon, which is transporting 5000 people to a distant colony planet. Two hibernation pods open 90 years too early by mistake. Complications ensue. The director was Morton Tyldum and the cast is led by Jennifer Lawrence and Chris Pratt.

Prieto is known for mixing and matching formats and recording media to underscore story and character, most recently on *Silence*, where he shot both digital and film. Other examples of his work include *The Wolf of Wall Street* and *Babel*.

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**“GETTING THE DATA
INTO A CONSISTENT
TURNAROUND AND
BUDGET WAS A BIG
HURDLE”**

— ● —

Rodrigo Prieto ASC AMC

On *Passengers*, he and Tyldum developed a conceptual approach built around purity.

“I try to find the texture of a film during preproduction,” says Prieto. “On *Passengers*, with a spaceship 600 years in the future, I felt that the air inside the spaceship should be very clean. That took us in the direction of a very transparent, pristine image. Morton had not worked with digital yet, and he wasn’t necessarily sold on it. Through several phases, I shot all sorts of tests including film negative and different digital cameras with a variety of lenses.”

The tests also compared anamorphic versus spherical and a widescreen 2.40:1 frame was chosen. The filmmakers thought the optimal look was captured with the ARRI ALEXA 65 and



Panavision Primo 70 lenses. *Passengers* was one of the first feature films to use this particular combination throughout.

"With the Primos, I could really see a difference," Prieto says. "They maintained the resolution of the big format, but I could open up to T2 or T2.8. The results were beautiful because the image was high resolution and very pristine, and yet had a softness to it with the shallow depth of field. It was a more romantic image, in a way. I could use depth of field to isolate the characters from their environment or, when we wanted, to include them in the environment by using deeper stops with higher ISO ratings. In the wide shots, we'd have the resolution to see these incredible interiors of the spaceship that Guy Dyas designed."

Prieto occasionally added a tiny degree of SoftFX filtration. Tyldum responded to the way faces looked. "We knew that the movie was really about these two characters, and that we'd be on their faces all the time," says Prieto. "The skin tones, their expressions, the texture of their faces, the colour of their eyes and the sharpness in their eyes - that was all very important."

DIT Nick Kay provided a film-based LUT that gave Prieto a solid starting place. "I was able to change the ISO rating on the

camera, sometimes even within a scene, without any noticeable degradation or noise," Prieto says. "I might use 800 ISO on one camera, and for the tighter shot on a longer lens getting a close-up, I might use 1600 so that the depth of field appeared more similar. The ability to go to 1600 ISO while maintaining a clean image was also a big asset because the sets incorporated a lot of practical LED lighting. While shooting, we were also managing the white point on the camera itself. We were using different colour temperatures for the sensor, depending on whether I wanted a scene to feel a little cooler or a little warmer. That's incorporated into the raw image, and I could feel it on the monitor on-set and decide what worked best with our LUT for each scene."

Kay had worked with Prieto on *Vinyl*, which helped. "Rodrigo wanted to veer away from a traditional style of video grading, more towards film-style grading, mainly colouring in density," says the DIT. "I gathered some information and discerned a printer point equivalent on LiveGrade, our on-set platform. That way, when Rodrigo wanted to dial a half point of red, we would all be doing it to the same value, a value more consistent with traditional photochemical timing. That worked well and looked great, too."



Passengers was one of the first full productions to download and process ALEXA 65 footage and deliver ARRIRAW to the lab on shuttle drives. On average, about 12 TB of data went out every day. The production used two Codex Vault XLs and eight 8TB SSD Transfer Drives.

"The ALEXA 65 produces basically four times the data," says Kay. "Getting the data into a consistent turnaround and budget was a big hurdle. By keeping the data exchange more conventional, we eliminated extra stages of downloading and RAW processing before the lab could download to their SAN. Instead, the lab went straight to ingest, which cut turnaround time and additional lab time back to normal."

"I used 10GbE to Thunderbolt through Mac Pros to download the ARRIRAW from the Vault to 16TB Thunderbolt shuttles," says Kay. "We had two dedicated download systems, one for each camera. We kept the data backed up on-set until we received clearance from editorial."

Kay also used FSI DM250 OLED monitors, graded on Pomfort, and used DaVinci for stills. He used a Miranda 16X16 router, a Leader 5800 waveform, Fuji IS-mini LUT boxes, and worked off a Mac Pro.

Prieto says that the 6K imagery helps, even when the DCP in the theatres is closer to 2K. "When we did *Frida*, not too long after Roger Deakins made *O Brother, Where Art Thou?*, we found that scanning the film negative at 6K resolution, even when down-rezzed to 2K, gives you more information. With the ALEXA 65, even though technically the colour depth is the same, my impression is that I have more colour information. I've been enjoying the DI - I've got plenty of colour to work with, and there are no surprises."

The combination of the large format ALEXA 65 and the Primo 70 lenses complicated the job for Prieto's longtime first AC, Zoran Veselic. "It definitely took me out of my comfort zone," says Veselic. "But being out of the routine made me more attentive and mentally focused on every shot. Every movie is different, with its own challenges, demands and obstacles. I'm grateful and proud to have been a part of the process, and to contribute to the visual part of the storytelling with an artist like Rodrigo."



BLOODFLOW

Nao's music video *Bad Blood* was shot RAW to Codex Capture Drives with the ARRI ALEXA XT by DP Ben Fordesman

Although most feature films and many commercials use the ARRIRAW format with the ALEXA camera, it's relatively unusual for a music video production to choose this path. However, Nao's *Bad Blood* video, one of the entrants in the music video competition at Camerimage 2016, was shot RAW to Codex Capture Drives on the ARRI ALEXA XT by DP Ben Fordesman.

Ben's first choice of camera is the ARRI ALEXA. One of the reasons for shooting RAW was that the original aspect ratio was going to be 4:3. As he wanted to shoot at higher frame rates, it was necessary to shoot RAW to Codex Capture Drives. Despite changing to a 2.39 aspect ratio at the last minute (the night before the shoot!), Ben decided to stick with ARRIRAW. "We were compositing a lot of VFX," he explains, "and I generally prefer the original recorded data not to be compressed in any way."

The on-set workflow was straightforward – the ARRIRAW files were recorded to Codex Capture Drives. Although the piece wasn't shot in black and white, a monochrome LUT was used on-set for viewing and the dailies were transcoded to monochrome. Post was done by Four Walls in London, with colour grading by Luke Morrison at the Mill.



To see more of Ben Fordesman's amazing work, visit: www.benfordesman.com



CAMTEC®

INTERVIEW: KAVON ELHAMI

Here at Codex we are eternally grateful to the many customers who have supported us from the beginning. One such early customer is Los Angeles camera rental facility Camtec. Established as CamTec Motion Picture Cameras in 1989, Camtec has grown into a full service facility with knowledgeable staff and extremely loyal clients like Matthew Libatique ASC and Linus Sandgren. We spoke to Kavon Elhami, who recently became an associate member of the ASC (well-deserved!), about his company and what they've been up to recently.

Tell us about how Camtec got started and how long you've been in business.

My father Jay Elhami was studying film-making and cinematography in Berlin in 1970 when I was born. I have pictures of myself in diapers with an ARRI S on my lap. From very early in my life I was watching movies through a cinematographer's eye. My father took over Denny Clairmont's bench at Birns and Sawyer when Denny left to start his own company in the 80s. About 10 years later Camtec was born in our garage. When we started all our clients were my age - students and such in their early 20s. Over the years those clients have grown up into successful cinematographers and of course we have met many new friends and clients along the way.

What's unique about Camtec?

We have never strived to be the biggest. But we do strive to be

the best. We put a huge amount of personal love and attention into the projects that our friends and clients embark upon. The relationships that we cultivate with our clients are deep true friendships that we are very proud of.

Tell us about some of your key customers and any recent projects that you are particularly proud of supporting.

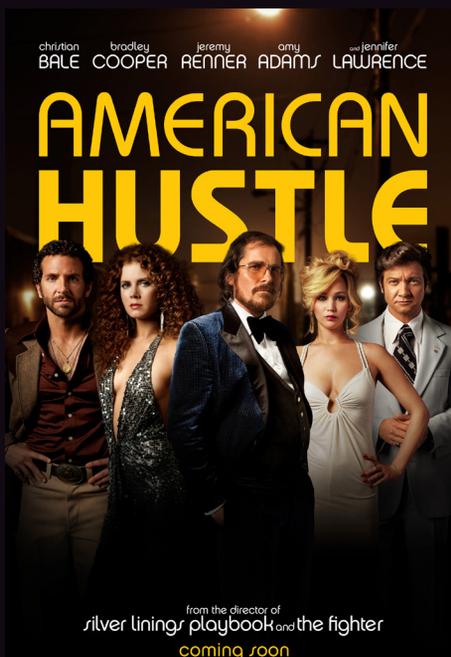
Really we are very proud of all of our clients. I think by nature of who we are, we attract a certain type of clientele. They are not necessarily impressed by the size of our building but rather enjoy and embrace the close relationship that I'm speaking about. It's really like a family. All my clients have my personal phone numbers. They know they can call me anytime. We don't just talk cameras. It's really a lot more than that. That being said, a few projects have brought us a lot of notoriety in the past few years. *American Hustle*, *Joy* and the upcoming *Battle of the Sexes* with Linus Sandren of course were huge.

Straight Outta Compton and many other films with Matthew Libatique. Matty and Camtec go back to the 90s! *Arrival* which Bradford Young just shot on our modified "Vintage" Ultra Primes. These projects of course have brought more attention to us in recent years.

How has the camera rental business changed in the past few years and how is Camtec positioned to address these changes and grow into the future?

Well, the equipment is of course always changing. But the underlying business, in my eyes, hasn't really changed all that much. Its about relationships, friendships, learning from each other, collaborating. I don't think that will ever change.

www.camtec.tv





Erik and Oliver Schietinger

Panasonic VariCam Pure
and Codex Capture Drives



CAMERA FOCUSED

in New York City and has been a customer of Codex since the days of the ARRI ALEXA and Codex Onboard M recorder. More recently, they've been an early adopter of the Panasonic VariCam 35 and now the VariCam Pure, cameras that are ideally suited for the technical requirements of companies like Netflix and Amazon Studios. They just completed a VariCam/Codex TV show for Netflix titled *Gypsy* and have a Warner Brothers feature *Crazy Rich Asians* shooting in Malaysia and Singapore with the VariCam Pure. We chatted with brothers Oliver and Erik Schietinger to find out more about TCS.

Tell us about how TCS got started and how long you've been in business.

TCS was founded in 1978 by T. Carl Schietinger, father of the current owners Oliver and Erik. Carl had a love for understanding the mechanics of motion picture cameras and after running a camera service division for several years, decided to strike out on his own. Initially, the company focused on camera and lens service; after earning a solid reputation for optical and mechanical expertise, TCS expanded to include rental and sales of motion picture cameras, lenses and accessories.

What's unique about TCS?

TCS offers bespoke camera rental service to our customers. We are camera agnostic and therefore advise based on creative choices and camera capability. Our goal is to present all the creative options and then ensure efficient and cost effective production.

Tell us about some of your key customers and any recent projects that you are particularly proud of supporting.

Recently we attended the ASC Awards in Los Angeles and 3 of the 4 categories had nominees for projects that we had worked with. Of those three, two DPs won for their category, so TCS supported 2 of the 4 ASC award-winning projects in 2017.

How has the camera rental business changed in the past few years and how is TCS positioned to address these changes and grow into the future?

Moore's Law is playing its part in the camera rental business as well. The pace of technological change is amping up every year. Not only is our main focus to stay on top of the new developments and weed out the good from the bad, but also

to share that information with the filmmaking community and provide the opportunity for people to test and make their own judgements. We have never had so many camera tests for studios and networks - Netflix, HBO, Warner Brothers, ABC, and CBS - as we have in the past 12-18 months.

What's different about being a NYC-based rental facility?

Hustle. You better bring your A-game in NYC, everything is a little harder here, but I think New York also creates and moulds great industry people because they have learned to adapt under extreme conditions (less space, less time, less patience).

Why did you decide to invest in the VariCam Pure?

We have been monitoring VariCam's progress over the last two years and think the camera reached an inflection point towards the end of 2016. We always want to offer the tools to create the best possible image so using Codex Recorder was an easy decision. With the announcement of the VariCam Pure, we knew that the camera system would be a home run.

"WE ALWAYS WANT TO OFFER THE TOOLS TO CREATE THE BEST POSSIBLE IMAGE SO USING CODEX PURE RECORDER WAS AN EASY DECISION"

Oliver Schietinger



Codex V-Raw Recorder



To learn more about TCS go to www.tcsfilm.com



“I COULD GO ON FOR HOURS ABOUT THEIR TECHNICAL SUPPORT, WHICH IS ABSOLUTELY AMAZING, AND HAS COME THROUGH FOR US IN A PINCH ON SEVERAL OCCASIONS. I’M A HUGE FAN.”

Stuart Dryburgh ASC NZSC

With a budget of \$135 million, *The Great Wall* is touted as the most expensive film ever shot entirely in China. Director Zhang Yimou, known in the West for visually stunning films like *Hero*, *House of Flying Daggers* and *Curse of the Golden Flower*, has said that even the team of more than 100 on-set translators was impressive.

DRYBURGH SCALES NEW HEIGHTS



SUCCESS STORY: THE GREAT WALL
CINEMATOGRAPHER: STUART DRYBURGH ASC NZSC
RELEASE: 2017

The tale is an action-adventure, with historical and fantastical elements including a greedy monster from Chinese mythology – a bit of everything, in other words. The cast includes Matt Damon, Andy Lau, Jing Tian, Pedro Pascal, and Willem Dafoe.

The Great Wall is also notable as the first full-length feature film to be shot almost entirely on the ARRI ALEXA 65. When filming began in March of 2015, the ARRI ALEXA 65 had been used on a few sequences, including underwater scenes in *Mission Impossible: Rogue Nation*. At that time, fewer lenses were available, and the camera could not accommodate high frame rates. Only 512GB Capture Drives were available, which limited run time to 10 or 12 minutes. But cinematographer Stuart Dryburgh ASC NZSC did not hesitate to recommend it.

"I pitched the ALEXA 65 to Zhang Yimou in our first Skype meeting, before I even got the job," says Dryburgh. "I told him that if we're going to shoot digital, this is the camera. *The Great Wall* is a film with great scope, a cast of thousands and big battle scenes. The 65 system would definitely be a help to us, and also for visual effects, given the resolution it would achieve."

Looking back to the project's early conception, Dryburgh says that the renderings of production designer John Myhre were one key to his approach.

The colour palette was tending toward earth tones, but complicating matters was the fact that four distinct divisions of the imaginary Chinese army had to be designated by colour. Testing helped find a balance between colours that were recognisably different and colours that popped out too much from the overall imagery. In some cases, costume designer Mayes Rubeo used dirt and wear to bring down the colours.

Given the costume and set design, Dryburgh found he didn't have to control colour as much using photographic techniques. The metadata, he says, was pretty much left at the base LUT established for the movie. For high speed shots, he used an ALEXA XT with Master Prime anamorphic glass, which delivers depth of field and angle of view characteristics not dissimilar to those of the ALEXA 65.

In general, using the ALEXA 65 didn't feel like a completely new camera system.

"Everything worked extremely well," says Dryburgh. "The ALEXA 65, being so closely related to the basic ALEXA camera system, was totally familiar. Everything about it looks, feels, and behaves like an ALEXA. It just has a much larger sensor. The full sensor, even when cropped for a 'Scope frame, is over 6K, but based on Legendary's post policies, we essentially down-rezzed as we went, backing up and storing at around 4K. But it's like

details really beautifully and in a flattering way. It's completely devoid of aliasing. That was to me an unexpected result. Once I saw that, I thought, 'This is awesome.' For my money, it's the closest any digital system has come to truly matching film in its ability to render flattering detail in faces."



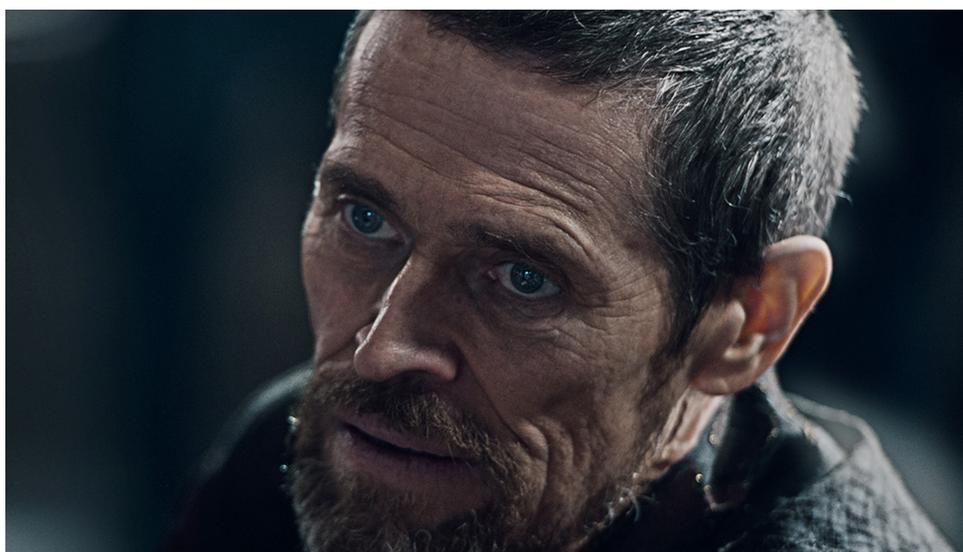
The Codex Vault systems used on-set helped ensure a flawless shoot despite the significantly increased data rates. Dryburgh says that the Codex recording and data handling systems are industry standards. "It's what we use," he says. "I could go on for hours about their technical support, which is absolutely amazing, and has come through for us in a pinch on several occasions. I'm a huge fan."

When the production was on the studio lot in Beijing, Dryburgh could check dailies on a large 4K screen. His DIT was Grace Guo. Her rig included two Leader waveform monitors and two Sony OLED monitors, all calibrated by ARRI Rental London. A TV Logic monitor was used for C camera, the XT. She set one of the ALEXA 65's two SDI outputs for Log C colour space, and used the other, set to Rec. 709, for the first AC to judge focus. The camera signal goes through AJA Kumo and three HD-link LUT boxes controlled by Live Grade from a Macbook Pro to the monitors.

"Then I could apply the special LUT that Stuart developed with the post production company from U.S." says Guo. "Stuart would have a look at every scene before shooting and make any adjustments. Then I would balance the three cameras and send signals back to Stuart's waveform. Having two waveforms was important when I couldn't be close."

Once the images were set, Guo saved CDLs to be applied at the dailies stage. The 512GB limit made quick offloads crucial. "ARRI Rental London and Codex provided the latest Codex S-Series Vault and one Codex XL-Series Vault for *The Great Wall*," she says. "They were very fast for offloading footage, but we still prepared enough Capture Drives to be safe. We set the Codex Vault on a small cart near-set, and my assistant picked up every Capture Drive and offloaded them. Once full, the internal module could be removed and delivered to China Film Group. Sim Digital handled backups."

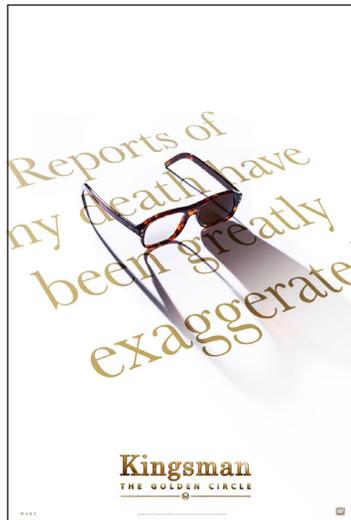
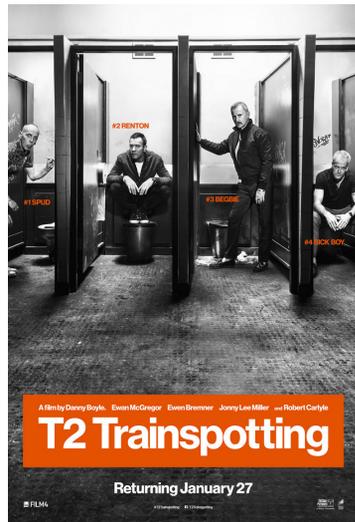
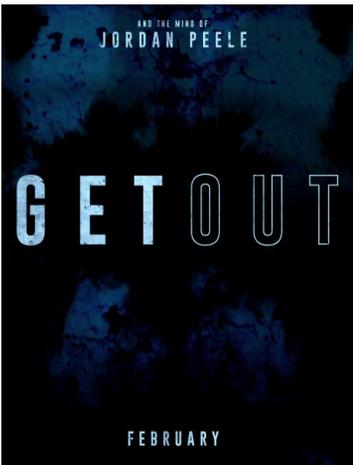
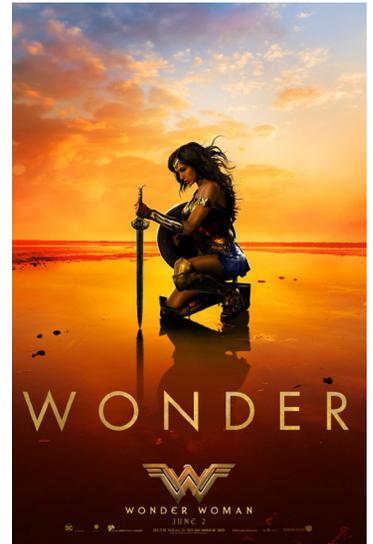
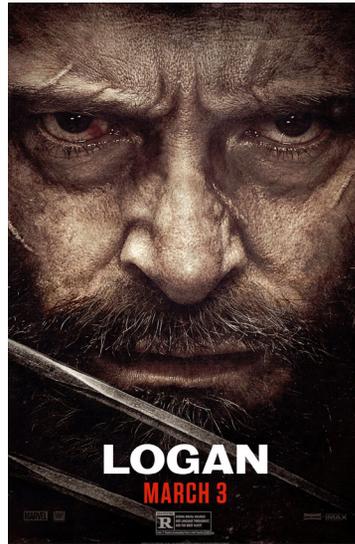
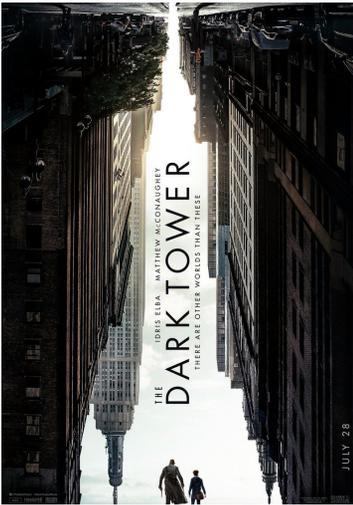
Guo first used Codex in 2012 on *Man of Tai Chi*. She says the technology has evolved quickly. "Codex responds very fast," she says. "And their technology is always upgraded. In only three years, cameras have become much lighter and flexible with internal recording. The ALEXA 65 has great colour and the 6K image is fantastic."



"I thought his set designs and renderings were incredibly beautiful, and my first thought was, 'Let's make it look like these,'" Dryburgh recalls. "They were high contrast, with a rich but limited palette. That was the basis for our conversations. Because the story involves mythological creatures, the setting wanted to feel very real and very true to its 12th Century time period. We weren't looking for a vintage look as such. In fact, we wanted to render the image honestly and basically and let what happens in front of the camera be recorded rather than be messing with it by using filters or strange CDLs or LUTs."

oversampling in a music CD. Given the huge number of pixels that you begin with, even when down-rezzed, it still looks really great."

Dryburgh was wary of excessive or annoying sharpness. "The main complaint cinematographers have about digital systems concerns the unflattering edges that they put on people's faces, bringing up lines and faults that you don't really see with the naked eye," says Dryburgh. "What's great about the 65 is that when you shoot a close-up, it renders the skin tones and the



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