Jon Fauer, ASC www.fdtimes.com Apr 2015 Free Preview 68-69 FILE FILE FOR STATE OF FOR THE STATE OF THE STATE

Cover: Michael Keaton, Emma Stone, Emmanuel Lubezki, Alejandro González Iñárritu on *Birdman.* Photos by Alison Rosa © 2014 Twentieth Century Fox. Leica Summilux-C 18mm, CineTape, Preston FIZ, ARRI Alexa M. Free 26 Page Preview of 96 Page NAB 2015 Edition

Birdman: Or (The Unexpected Virtue of the Unblinking Eye)



The phone rang minutes before these pages went to press. "Mr. Starr on the line." Maury Starr, latest tycoon, studio chieftain (name changed to protect the guilty) calls often to troll for news. He fulminated, "Whaddaya know about NAB?"

"96 pages. You can read FDTimes NAB issue on April 13," I said.

"Whaddaya kiddin'? I need your two-minute coverage right now."

"Half of it is NDA, secret, not to be divulged until opening day."

You could hear teeth grinding as he puffed and chewed on his Cohiba. "Here's the thing. *Birdman* won 4 Oscars. In 2008, *Slumdog Millionaire* won 8. There's gotta be a pattern, and my ticket to the next awards."

Maury is an award-watcher. Patterns perceived often become ingredients for his next film. This time, he was at a loss what these patterns might be. I promised to do a little divination, and sent him the following:

Birdman captured the imagination and votes of Academy members with its audacity, acting ensemble, and above all, style. Not style as in fashion. Style as in look, the way it was done. Although seemingly a single take, it was was divided into manageable takes joined with seamless transitions. At the ASC Awards, Matty Libatique quipped that the math didn't add up. 'The movie seems all the more impressive when you realize that it plays in one continuous take — somehow shot over 30 days.'

Alejandro González Iñárritu's *Birdman* took us on a giddy, gliding journey down narrow corridors. The camera moves were like *Das Boot* in a Broadway theater. It's not an accident, an unexpected virtue of ignorance, that both *Birdman* and *Slumdog Millionaire* both won Best Cinematography Oscars with their exuberant joyride of lightweight, unblinking, in-your-face camera work. Both films relied on new technology and custom modifications to achieve their distinctive styles.

At NAB we'll see all kinds of new equipment that will spark the imagination. While the cinema vérité cat on the shoulder took us out of the studio and onto location, the new cats go on gimbals and drones and may be more like Macavity the mystery cat (he's broken every human law, he breaks the law of gravity.)

With lighter and smaller cameras, multicopters and rigs to move

them, lenses and lights to define new looks, filters and effects to degrade those looks in ways that will horrify the engineers, sensors will get bigger, with more resolution, as we viewers move closer and closer to the movie screen, monitor, tablet or phone.

Some new products are not yet in this edition because their designers are racing to the finish. Some will arrive at NAB carrying prototypes, still soldering parts together in the taxi from airport to hotel. Other companies like to surprise us on opening day, revealing models under glass, pulling covers from mockups like rabbits from hats. They will astound us in press conferences and demos. AJA, Blackmagic, Cooke, Canon, Servicevision, Sony, and RED are a few of the companies with lots of buzz and rumors, cries and whispers.

ARRI surprised us with a flurry of pre-NAB announcements, including the new Mini and Alexa upgrades. In this edition, Stefan Schenk, Managing Director at ARRI Cine Technik, discusses his views on where things are and where they're going.

There's a lot of speculation about what's coming next from RED. NAB 2006 is where it all began. A year later in the RED tent, Jim Jannard introduced "a little something we shot in two days in New Zealand" with Peter Jackson. It was a bold move that invigorated the industry with ideas of democratizing the format and following the path that digital still cameras were suggesting: high resolution, gentle compression, small size, single CMOS sensor. The early roadmap included larger and larger sensors from the very beginning—mapped out even to VistaVision, I think.

Jarred Land, President of RED Digital Cinema, said, "VistaVision still seems to be a perfect format for RED. It has the aesthetic advantages of having a larger frame and retains the ability to still use faster glass without hitting the limited availability of lenses that 65mm has to deal with—especially on the wide end.

"With our Dragon sensor testing out at the very top of the still camera market, we naturally have a lot of customers who primarily use still lenses. And, of course, there are a huge array of options available for both new and vintage full frame glass.

"Speaking of handheld form factors...as we started designing the Epic and Scarlet cameras, we knew we had to get smaller than our RED One—but also up the resolution and other tech specs. Once we hit that form factor and starting shipping Epics in 2010, all the handheld guys kept asking if we could shave off any more weight. And that is how using magnesium and carbon fiber instead of aluminum was born. I think it has had a really big influence, since many other camera companies have followed with their own versions of Epic form factor."

There will be the usual debate at NAB comparing higher resolution, wider exposure latitude, larger or smaller cameras, different formats, formats that can handle all other formats, and where to find a decent lunch in the culinary desert of the LVCC.

Whether you're the latest tycoon or seasoned cinematographer, director, crew person, manufacturer, rental house staff, above the line, or below the line, I hope this NAB edition of Film and Digital Times will help fulfill the dream that if you can imagine it, you can shoot it. Or, as Eli Cross (Peter O'Toole) said in *The Stunt Man*, "If God could do the things that we can do, he'd be a happy man."

Birdman: Or (An Interview with Emmanuel Lubezki, ASC, AMC)



JON FAUER: Why did you decide to do so much handheld camera work on *Birdman*?

EMMANUEL LUBEZKI, ASC, AMC: When we started rehearsing the movie we hadn't defined the style of shooting. Then, based on the blocking, the rehearsals and what we felt the movie needed, we shot it half handheld and about half with Steadicam. Handheld cameras, especially smaller ones like the ARRI Alexa M, allow you to get really, really close to the actors. You can move within their space and between them. It allows you to get into the eye of the hurricane, as we say. I find that handheld has a more organic feel and way of moving that is less mechanical than a Steadicam. The Steadicam is beautiful for certain things, but it's a bigger machine and not as easy to get really close. The other thing with handheld is that you can go from very low mode to high mode very quickly.

You were shooting handheld with the Alexa M. Was Steadicam Operator Chris Haarhoff using an M or an XT?

Chris was using the Alexa XT. We were both shooting ARRIRAW. The other thing about the Alexa M, for me, is that I like to operate a lot and I like to frame. I think framing is an essential part of cinematography. Even though Chis is an incredible Steadicam operator, I like to have the camera in my hands. I can react to certain things, actor movements, reactions and so on. I can time the panning from one actor to the other. It's harder for me to express to the Steadicam operator how to do it, even though we do many rehearsals. There is something as a cinematographer that I like about being in control of my own framing.

How did you decide when you do a scene handheld and when to do it with the Steadicam?

The shot almost determined how it would be done. There are certain scenes, like long hallways or long moves at certain speeds that required the steadiness and gliding of the Steadicam. And there are other scenes that required the daintiness of handheld. It's bizarre: the movie, the blocking, the spaces informed us very quickly as to the best way to do it. We had one or two occasions where we switched from one to the other after many rehearsals. Suddenly we'd say, "This has to be Steadicam" or vice versa. It happened a couple of times. But mostly the movie tells you how to do it.

Are you shooting in this similar style on your current movie?

No, because this was a very particular concept for *Birdman*. The script was written in a way that called for this idea of the one shot. If we had found a space connected to the back of the theater that would have allowed us to do it in one shot, Alejandro would have done it. We cut just because we couldn't find the right space to do it in a single take. So we did half of the shots in the real theater and the other ones, in the guts of the theater, were built on a stage. But it was written as a one shot movie. I think every movie, every script, every story requires a different kind of approach. The movie we're doing now (*The Revenant*) requires its own particular language.

It's just too bad that the Alexa Mini that ARRI just introduced the other day wasn't available for *Birdman*. You would have had a much lighter camera to carry.

It was inconvenient timing for us that the Mini wasn't ready then. But we were able to work with the M. Also, we were lucky because we really could have not done *Birdman* the way we did if the M and XT were not out yet. We did extensive tests. We could not have done it on film. We tried film. We tried other cameras. It was truly a meeting of a creative script and technology that allowed me to do the movie this way.

Based on what you did, will a lot of people use small cameras...



Here's a camera that Chivo and Chris Haarhoff would have enjoyed on *Birdman*. The new ARRI Alexa Mini has a carbon fiber body and weighs 5 lb. Its titanium PL mount is connected directly to the sensor assembly for unwavering flange focal depth. It can also accept interchangeable lens mounts of the ARRI Amira for B4 video and EF (Canon) lenses.

The Alexa Mini can be operated by wireless remote control, as a normal camera with the ARRI MVF-1 multi viewfinder attached, or with an on-board monitor. It has user buttons on the camera body.

Alexa Mini is compact, quiet and (hurray) has a symmetrical design. You can shoot in almost any orientation: upside-down, portrait mode, straight up, down, etc. There are many mounting points.

A sigh of relief can be heard worldwide today. Alexa Mini comes with a 4:3 sensor. It will have an automatic de-squeeze mode for anamorphic lenses.

The camera records 0.75-200 fps, ProRes or uncompressed AR-RIRAW, either in-camera to CFast 2.0 cards or to a specially-designed external Codex recorder. The Codex recorder can handle up to four image streams simultaneously. For example, you might use 4 Alexa Minis at one time for car rig shots, stunts, or 360° plate shots.

Alexa Mini images will match all other Alexa cameras.

Alexa Mini has a built-in lens motor controller. New active lens motors can be connected directly. iOS or Android tablets can be connected via Wi-Fi to remotely control camera functions such as the motorized internal ND filters. Wow-internal ND in something this small. The ARRI Alexa Mini is scheduled to ship in May 2015.

NAB Booth C4337 Alexa Mini microsite: arri.com/alexamini

Canon C300 Mk II



Here's a camera ADM (Anthony Dod Mantle, DFF, ASC, B.S.C) might enjoy, since he's been using the C300 lately: C300 Mk II.

It's hard to believe that the Canon C300 was introduced 3 years ago. The camera has been very successful. Add a bunch of zeros after the 300 in the name, and you get very impressive numbers.

Now, Canon introduces the successor: EOS C300 Mark II. It records what almost everyone had been asking for: internal 4K. There are so many new features inside the familiar C300 body shape, maybe they should have named it the C400 or C4K. At least 4 prototypes will be on hand at Canon's NAB booth.

Here are some of the new things in the C300 Mk II:

- RAW recording via connectors at rear of camera.
- Internal ND filter cuts 8 and 10 stops of exposure in camera (previously the maximum was 6 stops)
- EVF can display a clean picture area without text. Information can be positioned outside the picture area, along the edges of frame.
- You can send a waveform via HD SDI to video village.
- Improved EFV and monito: sharper and clearer
- HD SDI and HDMI connections

- New battery: 12 VDC industry standard
- Beefier fan, no fan noise
- Dynamic range has been increased to an astonishing 15 stops. Dual DIGIC processors (two separate processors, working in parallel) "expose" the image at 2 different ISOs simultaneously, high and low.
- ISO: 100 102,400
- Sensitivity has been changed, we can now use lower ISOs (with the C300 it was recommended not to go below 640)
- Base ISO is 800 (instead of the light-meter vexing 850).
- Normal exposure latitude is 6.3 stops above and 8.7 below.
- Rec. 709, cine gamut, Rec. 2020, ACES compatible.
- Previous Canon log is still available.
- Slow shutter to ½ sec, timelapse
- 24-bit audio
- Dual pixel autofocus. Covers a wider area. Can tune autofocus parameters. Autofocus boost (auto/manual), Face detection, manual focus. Focus control wirelessly via iPad or iPhone with WiFi adapter.

Canon C300 Mk II, cont'd









- 3 indications of focus status: front, back and in-focus shown by arrows and colors. As you turn the lens barrel, the rectangle showing focus area turns green when sharp. You can position the rectangle with the joystick control.
- Cinema lenses now read out in f or T stops.
- Detachable cables to onboard monitor different lengths.
- Handle unit is more practical, with more ¼-20 threads and cheeseplate attachment.
- Interchangeable mounts: comes standard in EF, with options for locking EF or PL mount. Mounts can be changed in the factory, at a qualified rental house or service facility.
- By the way, there are 12 EF mount Cinema EOS lenses now
- Sensor is 8.85 Megapixels: 4096 x 2160
- Records internally to AVC Intra 422 10-bit or Cinema RAW externally

- Rolling shutter issues have been eliminated because readout is 2x faster
- Maximum internal frame rate: 30 fps in 4K, 60 fps in 2K, 120 fps in HD
- An accessory audio interface has XLR audio connectors.
- Internal recording to CFast 2.0 cards in 60 or 128 GB capacities for 20 or 40 minutes in 4K. In 2K, recording time is greater than 2 hours.
- Shipping estimated September 2015.
- Price is expected to be similar to original C300, around \$17,000.

NAB Booth C3628 and C4325 usa.canon.com/cusa/professional

Stephan Schenk on Alexa Mini, SXT, 65, Amira



Stephan Schenk (above right) is Managing Director at ARRI Cine Technik and heads ARRI's Business Unit Camera Systems. Michael Jonas (at left) is Product Manager of the ARRI Alexa Mini.

JON FAUER: A lot of new camera announcements were made by ARRI during the last weeks: a new software update road map for Amira, then the Alexa Mini, and Alexa SXT.

STEPHAN SCHENK: Not to forget Alexa 65, which has been launched by our colleagues from ARRI Rental. So yes, we have a lot of news for our customers. But the great thing about all that is that none of these announced cameras are making the others obsolete. Based on the tremendous success of our classic Alexa which by the way, is still in our line-up and is still being sold in what will soon be its 6th year—we received a lot of feedback on what to improve. We are trying to turn as many of those suggestions into products or product upgrades.

How has the reaction to Amira been since it started shipping in June last year?

Amira has been very well received and, as I mentioned, not by replacing ALEXAs. We have reached out to new customers who might have used Alexa on one occasion or the other, but now have really invested in Amira, because it is exactly the right tool for what they do. Take Jamie Oliver with his cooking show or the NFL. TV shows have embraced Amira for productions like *Das Supertalent*, the German equivalent of *America's Got Talent*, as well as Reality TV shows. The 200 fps capability is making it a popular choice for commercials. I just read in a British magazine that Amira last year was the 4th most rented camera in the UK, quite remarkable considering that we just launched it mid-year. I have to thank all the early adopters here for relying on Amira.

What's next with Amira?

We try to get even better—both, in hardware and software—to ensure a long product lifecycle, as with Alexa. We made a new eyepiece because we received feedback to improve it, and we did.

Then we announced the software update road map for the next 2

updates. With SUP 2.0 Amira supports 4K UHD, and with SUP 3.0 it will have a 50 Mbps codec. So Amira will give customers a huge number of options from low broadcast-style data rates to Alexa-quality ProRes 444 high data rates. And we, of course, are already thinking about what to add next.

The Alexa Mini announcement got a lot of attention. You must have received a lot of feedback and questions. It ranked among the highest number of hits ever on FDTimes online.

Same with us. Our server was down for 15 minutes. Not that I like that, but the interest in Alexa Mini was and, more importantly, continues to be phenomenal.

Are we in a new era of hand-held camera work? *Slumdog Millionaire* a few years ago and now *Birdman* both won best cinematography Oscars with lighter, smaller, hand-held cameras.

Not so sure. Both Anthony and Chivo use normal form factor cameras on their projects, too.

In *Birdman* Chivo used Alexa M but also Alexa XT. Anthony had 9 different camera types on *Rush*, including a classic Alexa Plus and Alexa Studio.

I think DPs chose their tools according to their shooting style but even more according to the project needs. And this is exactly why we have so many different cameras. At ARRI we believe in dedicated cameras for dedicated jobs – not in one fits all.

There's a long history at ARRI where our studio cameras were accompanied by our lighter and smaller companion cameras like the 2C, 35-3 and 435 or the ARRICAM LT. Many DPs like to have well balanced cameras in a pick-up and shoot configuration and not only box cameras that need to be complemented by accessories like a Christmas tree.

What market is the Alexa Mini aimed at?

The Alexa Mini is a companion camera to the Alexa in the first place. Our customers ideally would like to have the same image quality for their A, B and C cameras. Alexa Mini gives them exactly this. But equally, Amira is a wonderful shoulder mount camera for handheld work. It has the same sensor and image quality and can also be easily intercut with Alexa and Alexa Mini footage.

Secondly, there is a fairly new style of shooting out there, where DPs use gimbals and multicopters for their projects. There is a huge interest in Alexa Mini among these creatives.

How did the idea for the Alexa Mini first begin?

Actually it started way back with Alexa M. In the early days of Alexa, our customers requested a smaller and lighter model for rigs, cars mounts and special applications in addition to their A camera. Also for the 3D rigs, the classic Alexa was not the ideal choice. Ask Larry McConkey, who bravely had a 3D rig with 2 classic ALEXAs on his Steadicam on *Hugo Cabret*.

That was the reason we built the Alexa M. James Cameron and Vince Pace approached us because they wanted to have Alexa image quality in a smaller form factor for their 3D rigs.

About the same time, I first met Anthony Dod Mantle, and asked him whether he would consider the classic Alexa. He said, "Well, my shooting style is a bit different and I like to have a small formfactor camera." So I said, "What if we remove the head?" He

Stephan Schenk on ARRI, cont'd



Alexa 65 available through ARRI Rental

Alexa SXT

Alexa Mini

said, "Certainly that would be an interesting idea." From that day on, our email subject line was "Marie Antoinette" as the Alexa M developed. He was one of the first to use it, on *Trance*. Quite a number of significant productions have used Alexa M: *X-Men Days of Future Past, Dawn of the Planet of the Apes, T.S. Spivet* and *Divergent* to name just a few more.

But the requests were eliminate the cable, because a fiber connection between the head and the back end is not always ideal. So now we have an answer to this with Alexa Mini.

Why couldn't you come up with Alexa Mini earlier? Was it a physical limitation of shrinking the electronics down to that size?

Yes, at that moment in time, we could not squeeze everything into a small package, so we had to separate the camera head and the recording unit with a tether. Now we are able to benefit from advances, some of which are also seen in Amira.

What is important to point out is that the entire processing hardware is already inside the camera. There's no need for external computer cards and a computer to get the files processed. It is all in the camera. You record completely processed color images onto internal CFast 2.0 cards or onto the Codex recorder.

In your travels talking to customers, are most people going to use the Mini with internal data cards or do you think they will use the external Codex recorder?

I think there will be both. Most people will shoot ProRes to the CFast 2.0 cards and ARRIRAW up to 30 fps can also be done like this. But there are a lot of requests for high speed in ARRIRAW these days, and that is when they certainly will use the Codex recorder. Furthermore, the Codex records multiple cameras. Also, an external Codex is helpful in more dangerous scenarios where you may not want to record data on a camera that might get damaged, but is recorded externally, somewhere safe. Or maybe in a helicopter mount so you can easily swap capture drives.

You've been pretty busy lately with yet another new camera. Tell us about the Alexa SXT.

SXT stands for Super Extended Technology. Again, the list of wishes to improve and complement the Alexa is very long and our Product Manager Marc Shipman-Mueller and our R&D team in Munich are not getting tired of looking for ways to incorporate them in software updates. But some requests can't be fulfilled with software upgrades based on the same electronic platform; you need a higher performance base. Now with Alexa 65 we have this platform. However, Alexa 65 is a 65mm large-format camera and not the answer to all questions of shooting Super 35.

By using Alexa SXT, our feature film, TV drama and commercial customers can now benefit from Alexa 65 electronics and also from some new features that we implemented first on Amira, like 3D LUT-based looks. Therefore they will have a very powerful tool for their projects.

Amira

The 4K discussion continues and ARRI now also announced 4K features. What is your view on this subject?

All of our new cameras offer an in-camera 4K recording. However, and we have said this over and over again and it remains our message: spatial resolution is just one parameter of an image. If you look at what Alexa SXT will give you, it is not just 4K Cine and 4K UHD. We always aim to deliver the best overall image quality and also the best overall production costs, i.e. efficient workflows, reliable functionality, fast and easy color grading and VFX work.

Some production companies insist on native 4K.

First of all, Alexa 65 has a 6.5K sensor. If a customer wants high spatial resolution that is an option from ARRI through our ARRI Rental group, as there will be business-to-business deals possible.

Also, with Alexa SXT, Mini and Amira, our 4K image looks fantastic and we ask all our customers to just compare images. The creatives out there don't shoot test charts, they want to tell a story. Therefore we are not dogmatic about which pixel count to use, but about delivering the best image quality.

We do not claim that we have a new sensor, we openly say that we use our ALEV 3 sensor with a very mild 1.2 up-sample to create 4K UHD or 4K Cine in-camera. The ALEV 3 sensor may have fewer pixels than others but we think that our design of each pixel delivers more information with excellent results. But again, we leave that decision up to the user. Try, compare, and then judge the image quality.

In this year's award season, the vast majority of nominated feature films used Alexa. This is true not only for cinematography but also for VFX. Four of the five VFX Oscar nominated films were captured with Alexa, except *Interstellar*, which was shot on Imax. This says something about the quality of our pixel design.

It's going to be very exciting NAB for ARRI.

We really have a great camera line-up: Alexa 65, Alexa SXT, Alexa Mini and Amira. And don't forget, we have lighting, lenses and accessories too. In particular, with our anamorphic lens range and the new flare options, there is much to see. We're really looking forward to NAB.

Michael Jonas on Alexa Mini

Michael Jonas is Product Manager of the ARRI Alexa Mini at ARRI Cinetechnik.

JON FAUER: How did you first become involved in the Alexa Mini?

MICHAEL JONAS: Flying remote controlled helicopters used to be my hobby. When I worked at AVID, we built a small multirotor in our spare time. I was quite into the scene and had a lot of contacts. After I joined ARRI, a lot of people called me about being able to fly the Alexa. But Alexa cameras were not originally intended for this. A few people tried and built big multicopters, but it was pretty clear that just increasing the size of these rigs was not going to be sufficient for the kind of agility and movement required.

I used to be the project manager for the Alexa XT recorder module which had just been delivered so I had time to look into the large emerging market of gimbals. At the time, the idea of handholding multirotor gimbals kept coming up and Freefly introduced the MoVI. I went to a BBC tech meeting and talked to users. Next, we developed preliminary specs for a camera, including the size and optimal weight. We discussed the concept with our engineers who said they could try to shrink the Alexa electronics, but there would be a cost factor. We began with an exercise focusing on size and weight and cost. It wasn't unrealistic. We decided to build a prototype and see whether it would work out. And it did. It started as a very small idea and now it's a very, very cool project.

How does a guy from Avid, like you, wind up building cameras?

I've been in the motion picture industry for quite a while. I used to work for Das Werk doing VFX and later for a start-up called NXX/Alienbrain which got acquired by AVID. My focus used to be VFX and postproduction workflows, meta-data and asset management. I live next door to ARRI and I knew a few people. They were interested in hiring someone with a post background to do research on workflow and codecs. It seemed interesting and I joined ARRI. Initially, I worked on defining post production strategy, but a few weeks into the job, ARRI needed a project manager for Alexa XT and I was thrown in at the deep end.

Let's talk about the Mini. What is its intended use?

It was designed to be a companion to Alexa in order to cover all the scenarios where our larger cameras were not ideal. The goal was to have another tool in the ARRI toolbox which would have the same image quality but focus on low weight and a compact form factor. As it turns out the camera is really exciting because there are so many different ways you can use it and I look forward to seeing where this camera is going to end up. Underwater is a very exciting application because I'm a diver myself. Getting in touch with all these cinematographers who seek to get special shots is amazing and very rewarding.

Let's go into specific details. How do you plug in a lens motor?

The lens motor plugs directly into the titanium PL mount. There is an L-Bus interface with a Lemo plug on the PL lens mount. You can daisy-chain up to 3 cforce motors from there. Each cforce motor has two connectors. The daisy-chain keeps cabling simple and clean. We are going to release a new cforce model for the Alexa Mini that is smaller and lighter, but still has very serious torque. It is called the cforce mini and will work very well with primes and midsized zooms.

The PL mount has the same four pin lens contacts?

It is an Amira style PL mount with LDS contacts. You can use our new titanium mount, and you will also be able to use the LDS steel mount of the Amira. These mounts provide power for the Fujinon Cabrio zoom lenses. Also, you can use Amira's EF mount on the Alexa Mini, and the B4 mount.

Are third party manufacturers making mounts for Canon, Leica, Nikon, and other lenses?

I know there is a range of mechanical mounts available from P+S Technik, which include Nikon F-mount, Canon FD, Panavision and I believe Leica R.

What are you doing for the viewfinder?

It's basically the same EVF as used on the Amira. The cable is a little different because we have a new, very rugged connector on the camera body. Same EVF, new cable.

Alexa Mini has a 4:3 sensor. Will it handle anamorphic desqueeze in the viewing?

Not initially, but in a later software release with a license upgrade it will do 4:3 recording and de-squeeze anamorphic.

I guess your PCA group is busy building rigs to shoulder-rest the Mini and mount the Codex recorder on the back?

We'll offer a complete, modular cage consisting of multiple adapter plates and side arms. There is going to be a minimal, very lightweight adapter plate and a more complex one with 15mm rod support. We will provide a bridge plate adapter so that the camera can be mounted to our traditional cine-style bridge plates like BP-8 and be used with a long lens on a tripod if needed. We will have side arms that offer our standard rosettes for handgrips and extensions. There is going to be a battery plate that mounts on rods and has some special features for balancing. Also there is going to be a shoulder pad.

ND filters, LUTs, Monitors, Controls?

The Alexa Mini has motorized internal ND filters, very much like the system we have on Amira. Alexa Mini features our advanced look management known from Amira with 3D LUTs and CDL color controls in the camera. The camera does not need a viewfinder: camera controls can be managed with a four-button interface. We will provide a new version of the Transvideo StarliteHD 5" OLED monitor which integrates with the camera and will provide a touch interface. One thing I often forget to mention, that a lot of people asked about, is that the camera has an audio input. It's a Lemo 5-pin connector in front for stereo line level input.

We are going to build an LCD control panel for the camera as well. It's a standalone LCD system that you can connect to the camera in order to do the setups. The LCD screen and the buttons around it will be very much like our RCUs. It has two connectors. You can daisy-chain it between the camera and the viewfinder so you can put the LCD on the right-hand side for the assistant and use the viewfinder on the left-hand side. This LCD panel will also work on Amira so you can use it on the right-hand side assistant panel as well.

Michael Jonas on Alexa Mini, cont'd





The ARRI R&D camera team for the Alexa Mini, in Munich.

And the antenna in back?

It's for our lens control system. WCU-4 will be a good remote control unit for the Alexa Mini providing control of lens motors and operational parameters. There's also Wi-Fi built into the camera so you can control it via a smartphone, tablet or laptop wirelessly. It's a web-based system so you don't need an app. You just join the network of the camera and call up a specific web page and you will have full control of the camera. It looks similar to the menu or the display in the viewfinder.

Where is the recommended place for mounting an on-board battery?

We will provide a battery plate that will go on rods. Most of the gimbal operators will actually use the battery on the right side of the camera. Right now we are using Velcro to attach the battery adapter there but we are looking into something more "ARRI-like". I know that Freefly is working on a way to mount the battery on the side as well. There is going to be a very exciting new battery from PAG UK which provides 90Wh of power and I think around 10A of current in a very small and lightweight form factor.

It is going to be very good with the Alexa Mini.

Do we have to worry about blocking the cooling vents?

The cooling vent's intake is on the camera right side. The exhaust is on the back. A nice feature of the camera is that it is symmetrical and you can easily rig it upside down. So if you need the clean side for the battery mount on the other side, just switch the camera around and flip the image.

How long does it take to boot up the Mini?

The camera boots in about 12 seconds, which is quicker than some of the accessories we have tested.

Several rental houses who recently purchased anamorphic lenses, and need cameras with 4:3 sensors, are wondering whether to upgrade to an Alexa SXT or purchase an Alexa Mini.

I think they will need both. Alexa XT and Alexa SXT still is the better choice as the main unit camera. The Mini is the companion camera. The advantages of the Mini vanish very quickly with the amount of equipment you add on the camera. If you look at a typical main unit camera, it's usually built up with a video transmitter, motor controller, video monitor, UDM, lens motors, and what not. Next, add a large zoom lens, lens support, rugged baseplate, and you wind up with a large and relatively heavy package. Then, compare the practical day-to-day differences in media, of using internal CFast 2.0 to Codex Capture Drives. CFast 2.0 cards are very small and you need to take care of them, which is okay if you are aware of that. I'm not one to downplay CFast, but you can literally drive a car over a Codex Capture Drive, and not much is going to happen (hopefully).

In a really rugged environment, the Alexa XT is the gold standard and I think will remain the gold standard because it's actually built so solidly. The Mini has been designed to be small and lightweight. It is rugged, but not to the extent of the Alexa XT.

If you try to build the Mini up to an A-camera configuration, it isn't a big advantage anymore. It starts to become what people call a Frankencamera. The Alexa is very streamlined and efficient for what it's designed to do.

Of course, for somebody like Anthony Dod Mantle who likes to shoot handheld in front of his body, the Mini is the better choice for him.

If I were a rental house buying a Mini body, what else would I need to complete the package?

Along with the Alexa Mini, you would probably buy the viewfinder, the cage, the mounting option for the viewfinder, battery plates, a shoulder set, and base plate adapter.

If you want to control the camera in handheld mode, then a big advantage is in using our wireless control unit WCU-4 because it can remote-control the camera and you will be able to change all the operational parameters as well as control focus, iris and zoom. You'll probably want to buy three of our new cforce mini motors.

When you will actually be delivering the first Minis?

If all goes well, then we will start shipping in May.

Congratulations on a brilliant camera and its rapid introduction.

Leica M PL Mount











The Leica M PL Mount is here.

This rugged adapter lets you attach PL mount cine lenses onto Leica M (Typ 240) rangefinder cameras. Of course, you'll want to use Leica Summilux-C and Summicron-C primes, but the adapter will work with almost any other PL cine lens.

By accepting PL mount cine lenses, Leica M cameras become very interesting friends for cinematographers, both on set and on location scouts. With the M PL Mount, Leica M cameras can be used as director's viewfinders with real-time framing. You can capture the image as a still or video. An articulating electronic viewfinder (Leica EVF-2) provides a crisp, high resolution image.

The integral baseplate attaches directly to the lens mount and the base of the camera, providing support for heavier PL mount lenses without putting stress on the native M mount. It comes with a handgrip.

The Leica M–PL Mount Adapter is compatible with both the Leica M (Typ 240) and Leica M-P (Typ 240) digital rangefinder cameras. Both cameras have a 24-Megapixel CMOS Leica format (24x36mm) sensor. Shoot stills in RAW DNG and/or JPEG. Shoot video in full HD 1080p .MOV video at 24, 25 and 30 fps (MJPEG, 4:2:2, 100MB/s).

Both cameras come with the native Leica M mount, compatible with a large selection of legendary Leica M lenses.

The M PL Mount provides an additional interesting and useful function. Because the M is a 24x36mm format camera, you can see the entire image circle of native PL format lenses. You get a graphic image of exactly how much image area the lens will cover as well as the overall image shading (vignetting, illumination). You can crop this in Photoshop as needed.

Because PL lenses don't have mechanical rangefinder coupling, of course you cannot focus through the Leica rangefinder. Instead, focusing is done through the EVF.

- Technical reminder: flange focal depth of Leica M lenses is 28.70 mm
- Flange depth of PL lenses is 52 mm.
- Diameter of PL lens mount is 54 mm.

Leica Camera and CW Sonderoptic: NAB Booth C3623. cw-sonderoptic.com

Canon XC-10 (4K, 10:1 zoom, 1")









Here's an exciting new camera from Canon. Their 5D paved the way for still cameras that shoot video. This one is a video camera that shoots impressive stills.

If Canon's XC-10 looks like a mirrorless camera, well, it is. It will be at home on gimbals, drones, rigs, remotes, and anywhere else a lighter, smaller 4K camera with attached zoom lens is requested. Tim Smith called it a "POV and rig camera on steroids." It's also a lot more.

One of my favorite features was the removable prism finder that clips onto the tilting rear LCD monitor. It's very sharp, focusable, and compact. The XC-10 runs on the same batteries at Canon's DSLRs like the 5D. There's a swiveling right handgrip.

The XC-10 has a 1-inch sensor and an attached 10:1 zoom lens: 8.9-89 mm f/2.8-5.6. That's the impressive equivalent of 24-240 mm in full frame 35mm still format (and approximately 16-160 mm in 35mm Academy Format.) The Canon XC-10 records 4K UHD 3840x2160 AVC Interframe 422 8-bit up to 30 fps , 60 fps in HD. Files are MXF .MOV compressed 4K.

You can shoot 12 megapixel stills, or you can get 8 megapixel framegrabs from the video recording. Ships May or June 2015.



NAB C4325, C3628. usa.canon.com/cusa/professional

George Richmond on Kingsman



George Richmond, BSC was the cinematographer on *Kingsman: The Secret Service*, a Twentieth Century Fox Film production directed by Matthew Vaughn.

Anthony Lane's review in *The New Yorker* is always better than any spoiler alert: "The conceit upon which *Kingsman* rests is a simple one. The service in question is international, filthy rich, and independent of any government, although it is based in London and staffed by British agents. They are modelled on the Round Table, with sobriquets to match: Arthur (Michael Caine), Galahad (Colin Firth), Lancelot (Jack Davenport), and so on. They fight evil, crime, and other caddish deeds, and the front for their headquarters is a tailor's called Kingsman, in Savile Row.

"In case all this sounds too decorous for its own good, be advised that the director is Matthew Vaughn, who made *Kick-Ass* (2010), and whose idea of decorum, as far as I can gauge, involves switching to slow motion, in the wake of a savage punch, the better to show us an uprooted tooth sailing gracefully by."

Speaking of sailing by, ski jumping is the subject of *Eddie the Eagle*, a film now being produced by Mr. Vaughn's Marv Films. Eddie was Great Britain's beloved ski jumper in the 1988 Calgary Winter Olympic Games. The cinematographer is George Richmond. We spoke to George on location in Seefeld, Austria. He was using pretty much the same camera and lens package as on *Kingsman:* Hawk anamorphics on ARRI Alexa cameras, all from Vantage Film.

JON FAUER: How did you arrive at the look of the film?

GEORGE RICHMOND: The creative starting point was old spy movies from the 60s and 70s. We started referencing some of the early James Bond films as well as shows such as *The Avengers*. Matthew asked me early on, 'why don't films look like old films anymore?' We used that as a starting point, adding our own twist on the classic spy concept as we went along.

Cameras and lenses on Kingsman?

We had ARRI Alexa XT cameras recording ARRIRAW on the main unit. We used the Blackmagic 2.5K Cinema Camera to generate all the images for the monitors. Hawk V-Series anamorphics were our main lenses. We carried a set of Hawk V-Lites for the Steadicam. The other lenses were Cooke S4 sphericals, Angenieux handheld zooms (15-40mm and the 28-76mm), an Alura long zoom, and the Cooke mini/S4 primes for the skydiving sequence. Arri Media (now ARRI Rental) in London was the rental house. They own a few sets of the Hawk V-Series, V-Plus and V-Lites, but we went directly to Vantage for the second set of V-Series and two sets of their 45-90 and 80-180 mm zooms for both units.

On a VFX-heavy show, why use anamorphics?

Because the Hawk lenses gave a cinematic feel to the movie. Even though we cut spherical scenes in, 80 to 90% of the movie is anamorphic. They basically give you a cinematic feeling. They have pleasing aberrations. Anamorphic lenses give you wide backgrounds, but you're actually shooting with a longer focal length, because there's a longer lens inside of it that's being bent to make it wide. So you get a shallower depth of field. It makes actors look more film star-like. You really get the look of the actors because the lenses separate them from the background and it really allows you to concentrate on what you're looking at. I think it just makes them look good.

The other very good reason was that Matthew Vaughn had never shot on spherical. He wanted to shoot anamorphic too. So the big decision was what lenses to choose and you're kind of down to two choices really; you go Panavision or you go Hawk. And Vantage Hawks were the ones for this, because they just have that look.

The thing I like about the Hawk V-Series lenses is that they don't have the blue streak flares that the Panavision ones do. They feel slightly smoother and they have slightly more extreme aberrations around the edges. It seems almost as if they were designed for digital.

Why are so many lenses looking better on digital?

It's because digital has a harshness; it has a sharpness to it because of the lack of grain and the lack of texture that's inherent in film. Film just softens everything off a little bit, which is why we use it. Actually, my first point of reference when shooting digital is the glass. I shot a mini-series for the BBC about the great train robbery and we used ancient Cooke Speed Panchro spherical lenses, which were basically 1930s glass rehoused. They made it feel and look old. They're warm and they're soft. And they have this slight portholing and loss of exposure on the edges. So the glass is the most important thing.

In ways that filters cannot do?

Filters just don't, no. Because filters affect everything in a flat way. If you put a soft filter on, it affects everything. If you use an old anamorphic lens it allows the point of sharpness to be sharp, but it affects everything else, basically in layers.

You used all the Hawks: the V-Series, V-Lite, and V-Plus?

Basically the main sets were V-Series, which are among the older ones that they have. I think the oldest set is the Hawk C-Series. The next series that they made, in the 90s, was the V-Series, and then they updated those with the V-Plus, which have a different baffle inside the lens and they're a little bit more contrasty. I didn't use the V-Plus primes; but I did use the V-Plus zooms. So all the primes were V-Series, the zooms were V-Plus, and then we used V-Lites for handheld and Steadicam. Most of the second unit and the fight sequences were done with spherical lenses.

The anamorphics matched the spherical lenses nicely.

Yes, but that's because we spend a lot of time in the DI suite grading them and a lot of those lenses were squeezed at the edges, to give a sort of anamorphic feeling to those spherical lenses. They digitally re-invented and added little bit of a pin cushioning in post, so to speak.

At what stop did you shoot?

Our target stop was sort of T2.8 to 4, and they work well there. If you're shooting anamorphic wide open you can get certain focus aberrations all around. But most of the movie was studio based so I could light it up to make the target stop.

Making a target stop, that's something the old movies did. They lit their sets up to make their lenses work best. I worked with Alex Thompson, BSC years ago. I was one of his clapper-loaders and he always maintained that anamorphic looked best at T4 to 4.5 on film. So he'd light everything up at T4 to T4.5.

What lenses did you use on your last film?

Unlocked was a Michael Apted film. It's very good, with an amazing cast. Michael Douglas, John Malkovich, Noomi Rapace, and Orlando Bloom. We shot in Prague and in London. We used the Hawks again. I like those lenses.

Describe the skydiving sequence on Kingsman.

Brad Allan was 2nd unit director; Craig O'Brien was aerial unit DP with helmet mounted cameras and a belly mounted 2.5K Blackmagic Cinema Camera.

We had six days to film this sequence, which we had previsualized and then broken down into smaller bite size pieces of action. With just under a minute of free-fall time on every jump, Brad and his team were able to film up to three different elements over 50 or so jumps. For additional cuts they relied on Blackmagic's Pocket Cinema Camera, equipped with a 16mm prime, and had it fitted to a special wrist mount. We got some fantastic shots, particularly when the hand goes up behind the back of the parachute to pull the release cord.

In filming that sequence there was a lot going on. We had a helicopter for two days, shooting air-to-air with long lenses, and we had cameras on the ground shooting up with long lenses. We filmed the sequence using spherical lenses as they were lighter and more manageable in the air. It also meant that we had the ability to reframe in post if necessary.

Speaking of post...

Joshua Callis-Smith was the DIT and Rob Pizzey was Goldcrest Post's colorist. We applied grades on-set that followed through to post production. I've become very aware of the 'science' of DaVinci Resolve when it comes to solving color issues and balancing cameras on set, more than I ever thought I would. We took ARRIRAW and applied LUTs on set to view warm, cold, dark and light setups. The LUTs were created in preproduction, which meant two or three days were spent doing lighting and camera tests at Warner Bros. Leavesden Studios ahead of principal cast arriving. We had stand-ins wearing the real wardrobe to test how these would look.

With the help of Goldcrest, we created a series of looks in Resolve, saved them as 3D LUTs and then applied them to a second set of tests using different lights and colors to make sure they performed correctly across all of the lighting conditions we might use during production. This allowed me to start creating the look of the film before the cast arrived and gave me options when the director showed up as to how we might approach a particular scene.



Colin Firth as Harry Hart, impeccably dressed spy, in *Kingsman, The Secret Service*. Photo: Jaap Buitendijk. © Twentieth Century Fox Film Corp

John Paul Docherty on Kingsman on Fusion



1. Eggsy and Harry in front of window. Anamorphic lens. Green screen.



2. Green screen extracted using Fusion's powerful set of keying tools.

Fusion is a leading visual effects and motion graphics software toolset. VFX Supervisor John Paul Docherty describes it this way: "I see Fusion as a sort a Swiss Army Knife for VFX. It has a decent paint system, it's very fast, it's an accurate color space compositor, and has a good chunk of a 3D system thrown in. On set it's great for mock ups and quick roughs to give the DP and Director an idea of what can be done to make the best of what's in front of the camera. In post, these ideas can be worked up to finals in any color space and any resolution. I have a lot of background in 3D so the extensive 3D environment makes it particularly good for me.

Fusion Studio was used by John Paul Docherty's VFX house Doc & A Soc (Docherty & Associates) to construct many of the complex visual effects in *Kingsman: The Secret Service*. Two time BAFTA-nominated visual effects supervisor John Paul Docherty (*Skyfall*, *The Imaginarium of Dr Parnassus*, and *The Golden Compass*) composited more than a hundred VFX shots using Fusion Studio.

Docherty worked with digital matte painter Jim Bowers to create 360 degree environments for key sequences in the film, including a huge hangar filled with aircraft and secret service staff.

"The whole shot was an environment created by matte painter Jim Bowers, and we added in various moving elements, including workmen, a plane being towed and a man arc welding at the back, which is a little throwback to *Lost in Space*," said John. "There are about ten layers of environment in that shot, and then we ran it through Fusion Studio's 3D environment. The shot went through an awful lot of changes within Fusion, including re-lighting the whole thing, without needing any additional elements from Jim and then the foregrounds shot was keyed in."

Compositing for major explosion effects was also carried out in Fusion Studio, with Docherty creating glass shatter effects, together with mattes of building exteriors, which were overlayed



3. CG re-lighting is adjusted for final integration into plate.



4. The final shot.

on live pyrotechnic footage shot with high speed cameras. "In the explosion sequence we had to deal with four shots filmed with high speed cameras at Leavesden on a cold, rainy day. I then had to render this in, together with the glass shattering effects I'd created. We had to deal with multiple image formats and lots of lens distortion, as well as some pretty dramatic color space and resolution differences before we could effectively comp in the office and taxi elements."

Fusion's Dimension Optical Flow toolset was also a key element in Docherty's work, particularly when complex re-speeding issues had to be overcome. "In one scene we move from the aftermath of an action sequence to a moving taxi with the Kingsman logo flashing on a back seat monitor. This looks like quite a simple shot but the speeds on both sides had been adjusted by the editor, which works really well, however he would throw in cut frames that made the respeeds very complex. Fusion's Optical Flow did very well handling all of that."

Conflicting schedules meant that overall visual effects supervisor Steve Begg (*Skyfall, The Wolfman, Batman Begins*), one of the UK's most respected visual effects artists, had to move onto another production. Docherty was asked to take over as additional visual effects supervisor, splitting the remaining VFX with John Bruno (*Titanic, Avatar,* Oscar for *The Abyss*). Docherty covered a broad spectrum of shots, ranging from full CG and environmental simulation to cosmetic retouches, fixes and pyro work.

John said, "There's a very long shot where Valentine, played by Samuel L. Jackson is revealing his evil plan to Michael Caine's character, Arthur. The actors were shot on different days with different camera moves and no motion control. The complex workflow involved a load of tracked patches, re-speeds and reanimated elements as well as heavy duty color matching. Fusion handled it with ease."

John Paul Docherty on Kingsman on Fusion, cont'd



1. Live explosion shot slow motion against blue structure at Leavesden.



2. Integration and cleanup of explosion in Fusion.

Interview with John Paul Docherty

John Paul Docherty was born in Glasgow, Scotland. When he was 12, he moved with his parents to Toronto, Canada, got a BA at University of Toronto, moved back to the UK, and has been in London ever since. We did a follow-up interview a few weeks ago.

Jon Fauer: On Kingsman, did you talk with George Richmond about look, lighting and matching? And with the Director?

John Paul Docherty: Yes, the VFX dept worked with George on a lot of the sequences to get the look just where he wanted it, not just using Fusion, but Resolve in the DI suite as well. And of course, Matthew Vaughn was involved in all of this.

Kingsman was an anamorphic show?

Some of it was and some of it wasn't. It was every format known to man. The main unit had Hawk V-Lite Anamorphics. Most of the plates and dialogue were anamorphic. Pretty much all the effect shots were spherical, with Cookes mostly. There were Cookes and Canons. A good chunk of it was Alexa. Some of the stuff in the air was RED. Some of the POV stuff was Blackmagic Design cameras, some high speed stuff on a Phantom, a Canon 5D for some of the other bits and bobs. It was basically anything we could get our hands on. There were Hawk Zooms and big Alura Zooms.

What about the effects shot in the hanger?

Basically the foreground plate was anamorphic, shot on Alexa and everything through the window was CG. And the people moving in the background are CG as well. Yeah, all of that. There's a welder in the back, which we sort of snuck in as a little homage to Angus Bickerton and his work on *Lost in Space*, which Docherty also worked on. All the planes were mostly put together by a brilliant sort of 2½-D matte painter I've worked with a lot. He did a lot of the background work f in *Skyfall*, when Bond goes to the big



3. Fusion flexible node system is fully scalable, allowing for multiple staging areas and outputs. Pictures courtesy of Blackmagic.



4. The final shot. Pictures © Twentieth Century Fox Film Corp.

Dragon Casino. He also did a lot of the surrounding airport stuff for the plane crash stuff in *Casino Royale*.

What' does he use to create the mattes?

He uses all sorts of stuff. Mostly it's Softimage and Photoshop. And a lot of fancy tools for textures that he warps and does in his own weird and wonderful way. He's very, very CG conscious. I've worked with him on god knows how many movies now. And the good thing is we can exchange files and I can run them up in Fusion. We can effectively run a 3D comp between us. We bounce the files between us and work it up from there. That shot went through an awful lot of changes. It was quite difficult, originally, to get it looking realistic. It was about 15 layers of normal passes and lighting passes.

In addition to Fusion, do you use Resolve as well?

George and Eddie Hamilton, the editor, put together a color workflow for the show. Because every lens and every camera format known to man was used, everybody used DaVinci Resolve Lite, the free version, to do their final QuickTime assembly to go into the edit. We could then take George's 3D LUTs that he'd created on the full Resolve for on set use. We could apply those to the QuickTimes so when they were dropped into the edit, it looked pretty much like what Matthew (the director) saw on set and didn't look completely different. So in that sense everybody, all the vendors, used Resolve to create QuickTimes that went into the edit.

I did a lot of work in the DI suite on the big Resolve at Goldcrest with George as well. For example, the parachute sequence was shot on many different cameras. To get the look consistent, we graded in Resolve and in Fusion, at both ends, to get it all to sit together. Then George and Matthew both had passes on it as well.

We shot the green screen material over four separate days. One day was blinding sun, the next was overcast. It was one of the last

John Paul Docherty on Kingsman on Fusion, cont'd

sequences to finish, and it wasn't anything to do with CG. It was just purely color intensity and matching.

I've been using Fusion for years. I knew Steve Roberts, the guy who originally wrote it, back when he was in Australia. When he moved to Canada they were about three blocks from where I went to school in Toronto. As I've said, Fusion tends to be like a Swiss Army knife. So if I'm on set, it's a valuable tool that helps me show a director how moving the camera three degrees to the right could help production save a million pounds I can whack that together on a laptop with a little server under my arm. Rather than trying to explain it in words, I can just grab the DP, grab the Director and say, "Have a look at this." Or ask, "Is this what you've got in mind?"

Fusion has a very fast paint system, it's a fast render, and it's got a pretty fancy 3-D system. The guys at Fusion are very good. You can call them up and talk to Steve Roberts or one of the software guys. They're very responsive.

What was the company originally?

They were an Australian Production Company that built this compositing system around 1987. It was originally called Digital Fusion, and it went through 4 or 5 versions. Around version 5 Steve and the entire company emigrated en masse to Canada. Blackmagic Design took it over, and are doing a brilliant job. They've said that a Mac version is coming.

You mentioned grids for compositing. Some producers are trying to talk crews out of their prep days doing test charts in advance. I'd love to hear your point of view on that.

We tend to try and insist on that on any show these days, no matter what the budget is. Otherwsie, producers are throwing money away, because it'll cost them five times as much at the end of the day. I've had that argument so many times.

In VFX, a day in prep will save you five days in post if you're smart. If you're spending \$50 million on the VFX then maybe you can afford to wing it afterwards, but otherwise it ends up detracting from the look of the thing. I'm absolutely all for decent preparation. I really push pre-vis for a lot of things and camera lens grids are absolutely essential in this case. I mean, some of these anamorphic lenses are horrific, and as I said, we had all kinds of brands on this show.

There's an explosion shot in the film where an office in Whitehall blows up and the stunt guy jumps out of the explosion. We used Fusion to remove the lens distortion, to undistort it to match the spherical stuff correctly. The distortion around the outside edges in that anamorphic lens was just one of the most amazing I've ever seen. It had massive chromatic aberration and the edges turned to mush.

Normally what you do is work out a lens distortion that straightens everything up so if it's barreling you end up pin cushioning it to make all the lines straight. You basically make the geometry correct, then you invert it, and finally you put back the same distortion on your CG that the original footage had and stick it back on top.

Now, just to play devil's advocate, since we accept pin cushion and barrel distortion in anamorphic's on non-VFX shots, why is it so important on VFX shots to match? That's the point. You put it back. You end up with the same distortion in the end picture. You undistort it during the compositing to get the CG to match. Then you distort the entire thing back the way the original picture was. For example, if you've got a bit of debris flying across the screen in CG, say at 20 miles an hour, it's a consistent path, right? But everything else in the shot, the background plate, is going to be slowing down on the outside edge because of the distortion, and things will separate, things will fall apart, and physical dynamics will all look wrong.

Let's take your example of the hanger shot where you have the two actors on either side of the frame. That was shot with an anamorphic lens. Now hypothetically, what if you did not shoot those grid charts and what if you had the distorted foreground with the undistorted background; would you have fringing or what's would happen?

When the camera pans left to right, the edges of the hanger would move at a different rate than the camera inside the room and it would separate. It would swim against the background. You would get a bit of fringing as well around the outside edge, but that's pretty easy to fake in the CG.

The most important thing is if you don't get it right, anything CG that you stick onto anything real will separate at some point when the camera moves. It'll fly off and there'll be gaps or it'll float and hang on.

As you know, 50% of what we do is put fake bits onto real objects or into real environments and the minute the camera moves, you've pretty much given the game away. So without those lens charts it's really hard to get that right and you end up with tracking errors wherever the CG floats relative to the background behind it. It gets quite technical.

Fortunately the grids on this show were shot by the guy who was in charge of the match moving, a guy named Wesley Froud. He's one of the best tracker guys in London I've ever seen. He made sure the tests were shot with all the different focal lengths, at all the major focus distances and apertures. He shot tests to show any sort of breathing on the lens. Bear in mind, some of the lenses we had weren't exactly first rate. Obviously the worse the lens the more necessary this was, because you've got more dramatic flaws in the geometry that you've got to cover up.

There's another thing to bear in mind, particularly with anamorphic. And you really have to convince the camera department, because they get quite upset about this. You know, you might have three 40 mm anamorphic lenses on the show. And you can't just shoot one grid test chart with one of them. That's because they're not all the same. They may all be 40 mm lenses, but they're great big tubes of glass, and they have their own internal geometry that varies. So you have to test each one by serial number, not just by focal length. And you have to slate it with the serial number.

Fusion 7 visual effects and motion graphics software is now available free of charge from Blackmagic Design. The free version of Fusion 7 is fully loaded with visual effects and motion graphics tools like 3D compositing, paint, rotoscope, re-timing, stabilization, titling, 3D particle generator, and multiple keyers.

NAB SL 219 blackmagicdesign.com/products/fusion

Otto and Denny get ASC Award



At the ASC Awards in Hollywood on February 8, Kees Van Oostrum, ASC announced, "Tonight, for the first time, the Bud Stone Award will be given not to one person, but two, and it's only fitting. Fierce business competitors by day, friends at night, these two men might be described as two nuts from the same tree — a Hollywood odd couple that can only be celebrated together. Though their respective heritages were worlds apart, they became allies, and their new optics allowed us to see clearer, frame better, and compose the images that illuminate our creative endeavors.

For almost 40 years, their innovations, their engineering and, perhaps most importantly, their caring, have made an important difference for filmmakers. Their accomplishments advancing the art of film have not only touched each and every member of the audience here tonight, but cinematographers, directors and producers around the globe. It is with great pleasure and honor that I would like to invite Denny Clairmont and Otto Nemenz to receive this year's Bud Stone Award.

Shortly after, Barbara Streisand accepted the ASC Governors' Award: "My favorite cameramen, were the ones who never said, 'No, it can't be done.' Every director needs a partner and that's the cinematographer. Without that support, it's a nightmare. With it, it's a joy. When you have a close relationship with your DP, you develop a shorthand that makes the work so pleasant. It's a kind of deep understanding — an artistic bond.

"I love directing much more than acting, and it must be clear by now that I especially love cinematographers. After all, they turn your dream into a reality."



Leica Sci-Tech Award



The Oscar Sci-Tech Awards Show writers must take secret pleasure in torturing the hosts with unpronounceable names and tongue-twisting jargon. Hosts Miles Teller and Margot Robbie endured words like "voxels" and recipients thanking wives, exwives and offspring named Oscar. Here is part of the transcript from Leica's Summilux-C award.

Margot Robbie: The Leica Summilux-C lenses deliver ultra-high optical performance...can all we note just for a second that I get all the hard things to say and Miles doesn't.

Miles: I'm the beauty here, I'm the eye-candy.

Margot: And I'm the brains. Am I right? That's just a little unfair. The Leica Summilux-C lenses deliver ultra-high optical performance for film and digital cameras. They incorporate novel telecentric...are you serious?..multi-element, aspherical optics and this full series of prime...(*applause*)...thank you...I'm not done yet...full series of prime lenses deliver unprecedented optical and mechanical performance.

Miles: What did she say? On the mechanical side, precision machining gives each focus ring and iris ring accuracy and ease of repeatability for the operator. The small size of the lenses means smaller camera packages, cases, and rigs. On the optical side, the aspherical elements in each lens create a telecentric path of light allowing more illumination across the entire field. The beauty of these lenses was seen in *Birdman*, *Gone Girl*, and *Whiplash*.

Margot: Oh God, I loved Birdman. I loved that movie.

Miles: Did you see Whiplash?

Margot *(interrupting)*: The Academy presents the Scientific and Engineering Award to Iain Neil for designing the optics and to André de Winter for designing the precision mechanics in the entire range of Leica Summilux-C lenses.

Iain Neil: "On behalf of Dr. Andreas Kaufmann, owner of CW Sonderoptic and Chairman of the Supervisory Board of Leica Camera, and André de Winter, I'd like to thank the Academy for this award. Of course the lens project was a team effort and I'd like to thank Christian Skrein and Otto Nemenz for the concept and original specifications of the lenses. Some other people involved in the lens project whom I'd like to thank: Erik Feichtinger, Gerhard Baier, Rainer Schnabel, Uli Schroeder, Bill McCreath, and Roland Elbert. I apologize to the many others involved in the project whom I did not mention, but all of their efforts are appreciated."

Interview with Andreas Kaufmann



As the lenses were being developed over the past five years, I had interviewed most of the cast of characters involved in the project. But we had never really discussed the point of view of Dr. Andreas Kaufmann, Chairman and Owner of Leica Camera. After all, he was the one who took the risk, made the investment, and bore the responsibility. He was the admiral of the Summilux-C expedition. Here is his interesting narrative on how these lenses came about.

JON FAUER: What does the Sci-Tech award means to you and to Leica?

ANDREAS KAUFMANN: We are delighted to receive a Sci-Tech Award for our Summilux-C lenses. It is an honor for us and for our customers, not only for the cine lenses but also for the rest of Leica itself.

So the "glamor and excitement" of Hollywood might spill over into your still world?

Well, if there's glamor and excitement connected with the Scientific and Technical Award, yes.

How did the Summilux-C project begin?

In 2005, we were told by the Leica management that somebody had come to the company with the idea of producing Cine lenses. They were German guys and they proposed building cine lenses based on the architecture of the Leica Reflex Camera R lenses. That's when a few other people came into the picture. There was Christian Skrein, in November '05, with the connection to Otto Nemenz. I had the first meeting with Otto shortly after. Knut Heitmann, our former manager of research and development at Leitz, suggested that I talk to a fellow in Italy named Iain Neil.

We decided that the project could not be done within Leica at that time because we had started restructuring the company. This was towards the end of '05 – beginning '06. I had a talk with Iain Neil, the optical designer. At the time, he was at Media Lario, an Italian company near Brescia, Italy. I met him there. We agreed to work on this project. He added two former colleagues from Elcan (previously Leitz Canada) to the team. One gentleman was Bill McCreath, and the other was André de Winter. We already knew André, because he also worked for Leica in Wetzlar. Then they added one or two other guys from the former Elcan team. This was set up in '06 as a virtual Leica cine lens design team.

Interview with Leica's Andreas Kaufmann, cont'd

Who did what?

Iain was the optical designer. Bill McCreath supervised sourcing of components, and still does today. André de Winter was the mechanical designer. There were quite a few other individuals involved.

Including you.

Yes, there was a little bit of Kaufmann.

I should also say that Uwe Weller was part of the success. He and his company were the only ones who really were able to make the mechanical design a reality. The cams and cam followers were designed in such a way that they were the most complicated curves Weller ever did. (The distance from 6 feet to infinity is the same on every lens in the set, and the spacing between the focus marks is mechanically expanded.) It was a design that most people said basically you couldn't produce, with tolerances of something like a micron. So, Weller Fine-Mechanics is part of our company, and they were also a great part of the success.

Why was there interest in doing these lenses in the first place?

During the restructuring of Leica Camera it was very clear that one key element at Leica was the optical competence in designing, developing and producing optics. When we started to look into this segment, we thought it would make a lot of sense for Leica to also be established in the cine lens market.

How did you organize all this?

First we had to find someone to finance it because we decided to do it outside of Leica.

That was you?

I decided, on behalf of my family and me, to organize it as a separate entity. When we got the first order from Otto Nemenz, I would say that sort of gave us the push to say, "Yes, we can do it."

Why were the lenses so difficult to build?

Well, Iain was very clear and until now he's right. We had to build lenses that look into the digital world and go beyond 4K, with 8K on the horizon. They should also work with film cameras. They should be the smallest and most compact prime lenses. So he went for a design that I would say, in terms of production, basically skipped the word "tolerances." In production, it's easier to do something where you have a certain amount of tolerance built in. Here, they're basically non-existent for certain lens elements. We also have a very unique asphere from a very strange glass material which also has to be glued to another non-aspheric element, etcetera. So we have quite a few tricky things built in. It's a masterpiece, but hard to produce.

In your opinion, what is the great appeal and what's so unique about these lenses?

It's a great combination of a few things that are hard to combine. They're really small. They are not heavy. They have the same front diameter. They have a very special focus scale where all the focus marks are in the same position. And they have a very special look. I really must say that Iain and his team designed these lenses with a Leica look that is beautiful. It's crisp. It's rare. It has pleasing qualities of depth of field that you can play with. They are all T1.4. It's a combination of quite a few things.

How would you define the Leica look?

Very natural and smooth skin tones.

Very crisp eyelashes, yet skin is silky smooth.

Especially when you work with the depth of field.

A lot of rental houses are asking for more sets, despite the fact that they're hard to get. What can you tell them?

We have ramped up production since November 2014. We delivered around 140 sets, and have at least 3 times as many more on order, which is quite a lot.

Here we are with a brave new digital world where many cinematographers are resisting an unadorned, sharp look. How do these lenses help address that?

For example, David Fincher's *Gone Girl* was shot mainly with Leica Summilux-C lenses at very low light levels. He shot completely on RED cameras. I think our lenses helped to create this look in the digital world because they capture the light in a certain way.

What other features were they used on?

Summilux-C lenses were on *Birdman*, *Iron Man 3*, *Dawn of the Planet of the Apes, Crouching Tiger Hidden Dragon II, The Theory of Everything, Whiplash*, and many others.

I read an article in FT (Financial Times) that Leica Camera is doing well.

We're doing quite nicely. We're investing in three serious products which we will show in 2015, 2016. Leica has always been in a very special part of the market. We keep it that way and try to also go up-market. We developed the S system as a professional system and we acquired the brand Sinar to go into the medium format. We think we can carve out a very comfortable niche in the market.

Can you explain how your different companies are associated? You have an alphabet soup with ACM, CW, Leica, and so on.

ACM, our holding company, owns 100% of CW Sonderoptic and 55% of Leica Camera.

And where does Leica Camera go from here?

We will announce some new things at NAB and at IBC. We will try to speed up production of the Summilux-C lenses. We will try to get as many sets out as possible. The Summicron-C lenses are doing well. A little known detail is that even though they are PL mount, most can cover 24x 6 mm full frame still "Leica" format, which for certain cameras and productions makes sense.

Coming back to the Sci-Tech Awards and Hollywood, every good film cries out for a good ending. When the film is successful, there's a sequel. The interesting and good story here is the journey of Summilux-C cine lenses receiving a technical Oscar. There's drama and conflict. They were designed to the most incredible, "impossible" standards ever dreamed of. Is there a sequel?

I sometimes say, "We will never produce a lens like this again."

What, never?

Well, hopefully it will be something brilliant.

Tiffen Sci-Tech Award



An Academy Award of Commendation was presented to Steven Tiffen (center), Jeff Cohen (right) and Michael Fecik (left) "for their pioneering work in developing dye-based filters that reduce IR contamination when neutral density filters are used with digital cameras. The Tiffen Company identified the problem and rapidly engineered a series of absorptive filters that ameliorated infrared artifacts with lenses of all focal lengths. These widely adopted filters allow cinematographers to work as they have done with film-based technology." Photo by Matt Petit © A.M.P.A.S. Academy of Motion Picture Arts and Sciences' Scientific and Technical Achievement Awards— February 7, 2015, Beverly Hills, California.

Below, Steve Tiffen taking selfie with star Margot Robbie. Photo: Jon Fauer



Interview with Steven Tiffen





JON FAUER: What does the Sci-Tech Award mean for you and for the Tiffen Company?

STEVEN TIFFEN: This is the third time we've been recognized by the Academy. It is a tremendous honor when the people you get up and go to work for every day take a moment and analyze the technology, research it in depth, deliberate, debate, and determine that it is not only a product that they want to purchase but it's a product that they want to honor. It's an enormous tribute that we accept humbly and gratefully. It's wonderful that the Academy continues to recognize the technological breakthroughs and advancements that make the ability of telling stories available to everyone. That, to me is a very important thing to continue and hold dear.

What were the other two awards?

My father received an award for the development of our lamination process, the color core manufacturing process, that is the foundation of all the filters that we make. The proprietary process that he developed back in 1951 was honored by the Academy with a Sci-Tech Award back in 2000. Earlier, we received an award for the Ultra Contrast Filter back in the '90s.

Going back to 1951, how did he figure all this out? It's endured more than 50 years, half a century, the test of time.

It's a proprietary process. Trade secret. Sort of like the Coca-Cola recipe, only a few know it.

Like the Secret Kitchen at Crustacean Restaurant not too far away from here in Beverly Hills.

Secret sauce. It was a process that he used over years of development, trial and error, and working it out. As you said, it has stood the test of time.

At the Sci Tech Awards this year, 95 percent of the honors went to software companies and maybe five percent hardware. Do we see that is where the industry is heading or was it a peculiarity of the committee?

Like everything else, elements ebb and flow. Software is a driving force in the business. So much new software has been developed and it needs to be recognized. A lot of it might have been the Academy catching up to recognize these companies because some of the software and hardware had been developed earlier. For example, the DLP projection system was honored and it is not new. Maybe it's because these technologies have now been so universally adopted, but when they were first introduced they weren't as widely recognized.

No matter what, we're still going to continue to see the advancement of what I'll call analog technologies. We saw the Leica Summilux-C lenses awarded here tonight. You had Tiffen filters. The Biscuit Jr camera platform and MAT Towercam. Certainly there's still the need for mechanical analog technology that supports the digital technology, and vice-versa.

In the filter business, do you see it staying optical versus digital, and where is that heading?

The one thing I've noticed is that optical filtration has greater depth, and it just looks right. Our Dfx Digital Filter software is there to allow you to do things that you didn't do in-camera. But in the end, they give out awards for the best cinematographers. No matter what format they decide to shoot on—filters, cameras, lenses and lights are all the choices that cinematographers make to allow them to help tell the story that the director wants and ultimately convey the message visually. These are tools, just as software is a tool, for cinematographers to choose at their discretion. And as long as we continue to stay relevant, and companies like us continue to make products that are needed by cinematographers, we'll be around a long time.

I think many cinematographers prefer optical glass filters because they bake in a look that is established from the get-go.

And glass filters give the cinematographers complete control, incamera, while shooting. Cinematographers are educated this way; they understand the process. Again, these are tools, like a utility knife to cut gaffer's tape. Filters are there, like an artist's palette, to enable a cinematographer to have color choices, diffusion choices, and effects choices at their fingertips at the moment that they're capturing the image. That's always going to be the desired method. I will tell you that we finished the year ending in 2014 with our greatest filter sales in the history of our company. Even with all of the digital technology that exists today, clearly optical filters are in great demand.

Motion picture production is not like sports broadcasting for TV. While we may sometimes want a reality look, film is often the stuff of dreams, with scenes that take us to faraway and distant places. Maybe harsh reality isn't the desired effect. Optical filters are a quick, easy, inexpensive, and controllable way to manage the image and help create a look.

Ben Smithard, BSC on The Second Best Exotic Marigold Hotel



I spoke with Ben Smithard, BSC (above) about his work as Cinematographer on The Second Best Exotic Marigold Hotel, released in the USA on March 6, 2015. Photos: Laurie Sparham. © 2014 Twentieth Century Fox Film Corporation.

Describe the look and style of Second Best Exotic Marigold Hotel

It involved lots of conversations. Most of the preparation for the film and how it was going to look came about by just being there, taking photographs, going to locations, and discussing. The experience of being in India was a big part of making the film.

We were following characters who were experiencing India in a similar way that I was experiencing it. When all the cast and crew from England got there, along with a massive Indian crew, it almost felt as though we were part of the story.

Of course, John Madden, the director, and I discussed all the usual things you discuss when you're making a film. You make reference to other films and photos. This is a contemporary film set in a real place and we were shooting it for real.

I have a love of photojournalism and photography, so I was like a kid in a sweet shop when I got there. I was taking photographs of everything. The hardest thing about shooting this movie was trying to avoid the cultural clichés of India, photographically. That's very difficult because India is one of the most photographed places in the world. The difficulty came in making something completely original. So the look of this film was driven by the story. You followed the story, followed the characters.

John Madden is not only a great director, he is an amazing craftsperson. I think that's a great thing in a director, somebody who really understands the craft of filmmaking. When you've got an ally like that, there's nothing you cannot do.

Camera choice

Originally there was a conversation about shooting film on the project. But we were in Jaipur and Udaipur, which is quite a long way away from the lab in Mumbai. Although they shot film on the first *Exotic Marigold Hotel*, I had a bit of concern about the reliability of the laboratory.

I shot my previous film, *Belle*, on the Sony F65. I think it was the first British feature film done on the F65, and I liked the look. When we moved away from film on the *Second Best Exotic Marigold Hotel* I decided on the F65 because I knew that we would be taking the cameras from London and shipping them to India. I was very happy with the camera and the rental company that I use, Movietech in Pinewood Studios, London. They are very reliable and the lenses from that company are amazing. They're all really well looked after. You know you're going to get really good backup with them, which was important being in India. When I used the F65 on *Belle*, there were no technical hitches at all with the camera. It was completely reliable, and if you're shooting in India, you need a reliable camera.

My decision to shoot with the F65 was based mainly on the fact that I'd already shot a movie on it. I knew what I was getting with the camera. We took three F65 cameras. We shot with two and we had a spare body the whole time.

I also took a RED Scarlet with me. I used it for interior car scenes, because it's smaller or I could make it really small. The cars in the film were tiny. They're mostly night scenes. They matched nicely. In the digital world, the differences are quite subtle. It's not like film, where there are big differences between the film stocks.

Lenses

Our entire lens package came straight from *Belle*. I knew what I was getting. I used the whole range of Cooke S4 primes from 14 to 135 mm. I also used the Angénieux 17-80, which is my personal favorite zoom lens. It's very sharp. There's a really nice look to it. I have that on my camera nearly all the time. I also had the Angénieux Optimo 24-290 and 28-76.

If you're going to use very good glass like the Cooke S4 lenses, then you need good zooms. I like working on zooms as much as I can. I use the primes for handheld or Steadicam. I've never had any major problems trying to match them, to be honest. I like the Angénieux Zooms. I like the way they're built. They are well-made, and well-constructed. If there's a very slight color shift between zooms and primes, it's easy to correct in the DI. That never really worries me.

On *My Week with Marilyn*, I used Cooke S5/i primes. That was the first time they'd been used on a film. They looked great. But lately, I think people are obsessed by using old lenses.

I did a big commercial in Argentina at the end of last year and I wanted to shoot Anamorphic on the Alexa. I was offered a set of vintage Kowa Anamorphics from Musitelli, the rental house in Uruguay. They had a really interesting look. One of them was just unusable because it just wouldn't focus at any T-stop. As there were only four in the set, I had three lenses to shoot with. But those three were great. I think on my next film I probably would like to shoot Anamorphic.

Diffusion or filtration

I sometimes used diffusion. John Madden, the director, wanted the film to look as realistic as possible, so I didn't over-diffuse it. I used very light diffusion here and there, but nothing that was too noticeable...

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