FILM AND DIGITAL TIMES

Art, Technique and Technology

Film and Digital Times is the guide to technique and technology, tools and how-tos for Cinematographers, Photographers, Directors, Producers, Studio Executives, Camera Assistants, Camera Operators, Grips, Gaffers, Crews, Rental Houses, and Manufacturers.

It's written, edited, and published by Jon Fauer, ASC, an award-winning Cinematographer and Director. He is the author of 14 bestselling books—over 120,000 in print—famous for their user-friendly way of explaining things. With inside-the-industry "secrets-of the-pros" information, *Film and Digital Times* is delivered to you by subscription or invitation, online or on paper. We don't take ads and are supported by readers and sponsors.

subscribe
www.fdtimes.com

Subscribe online, call, mail or fax:

Direct Phone:	1-570-567-1224
Toll-Free (USA):	1-800-796-7431
Fax:	1-724-510-0172

Film and Digital Times
On Paper, Online, and On iPad

Print + Digital Subscriptions
Film and Digital Times Print + Digital subscriptions continue to include digital (PDF) access to current and all back issues online.

iPad and iPhone
Get Film and Digital Times for iPad and iPhone on the Apple Newsstand. Download our free app in the iTunes Store (search: Film and Digital Times). Get individual issues, back issues, or an annual subscription.

Digital (PDF) subscriptions
Digital (PDF) subscriptions include unlimited access to the current and all back issues. www.fdtimes.com/issues

FDTimes Customer Service
For subscription or account questions, please contact us by phone Monday–Friday, 9 am–5:30 pm EST.

Phone:	1-570-567-1224
Toll-Free (USA):	1-800-796-7431
Fax:	1-724-510-0172
Email via website:	fdtimes.com/contact
Mailing address:	Film and Digital Times Subscriptions
	PO Box 922
	Williamsport, PA 17703 USA

Editorial offices in New York City

---

www.fdtimes.com

On Paper, Online, and now on iPad

Subscribe
Online:
www.fdtimes.com/subscribe

Call, Mail or Fax:

Direct Phone:	1-570-567-1224
Toll-Free (USA):	1-800-796-7431
Fax:	1-724-510-0172

Film and Digital Times Subscriptions
PO Box 922
Williamsport, PA 17703
USA

☐	1 Year Print and Digital, USA	6 issues	$ 49.95
☐	1 Year Print and Digital, Canada	6 issues	$ 59.95
☐	1 Year Print and Digital, Worldwide	6 issues	$ 69.95
☐	1 Year Digital (PDF)		$ 29.95
☐	1 year iPad/iPhone App upgrade (normally 29.99) *Get FDTimes on Apple Newsstand with iPad App when you order a Print or Digital Subscription (above)*		+ $ 9.99

Total $ _____

Payment Method (please check one):

☐ VISA ☐ Mastercard ☐ American Express

☐ Check Enclosed (payable to Film and Digital Times)

Credit Card # _____

3 or 4 digit security code_____

Expiration Date_____

Signature _____

Name _____

Company _____

Title_____

Address _____

City _____

State or Province _____

Country _____

Zip or Postal Code_____

Phone _____

Fax_____

Email_____

Contents: May-June 2021 Issue 108

Cover Photo Credits

Kazuto Yamaki, CEO of SIGMA, discusses fp L

Kazuto Yamaki with SIGMA fp L at Lake Inawashiro. Photo: Junya Taguchi.

Kazuto Yamaki is CEO of the SIGMA Corporation. He graduated from Sophia University in Tokyo and joined SIGMA in 1993. He was named Corporate Planning Director in 2000, Executive Vice President in 2003 and Corporation President in 2005. Mr. Yamaki became the CEO in 2012. We discussedt the new SIGMA fp L camera by video conference and email.

About the Cover

Jon Fauer: Thank you very much for doing the cover. Would you please tell us about the "making of" this photo?

Kazuto Yamaki: It was very, very windy day on Lake Inawashiro. The name of the place where we took the image is Konan, which literally means "the south of the lake". On the other side of the lake is Mt. Bandai, as you can see in the image. A very strong cold wind coming from the top of the mountain beat against us. Sometimes it was hard to breathe or even stand up against the wind.

During the photography session, I was thinking about the lives of those who lived here for centuries in very simple Japanese houses made of simple wood, with thin wood and paper walls. It would have been a very tough life.

We chose this place mainly because you suggested a "Japanese style" image. We also considered a location with cherry blossoms in full bloom, but realized that would have been too typical.

The waves and whitecaps created by the strong wind on Lake Inawashiro recalled the world of Hokusai Katsushika and his famous woodblock print *The Great Wave off Kanagawa*. The pine tree in the foreground is called *Matsu* in Japanese.

I was dressed in a modern, tailored suit and sat in a traditional *Seiza* position. I was trying to portray a modern Samurai who shows respect to the products we produce, just as the real Samurai respected their *Katana* (swords). We liked the contrast. Having said that, we were not too serious at all. Our aim was to create the picture with sense of humor.

About the name of the new camera: fp L

We know that fp stands for fortissimo pianissimo. What does the added "L" mean?

The main meaning is "Leap". Thanks to its enhanced features, we believe that fp L has achieved a quantum leap in its performance while maintaining key concepts of the fp series: compact body, seamless usability between stills and cine, and scalable functionality. However, we also think that users can define "L" as they wish because the fp series, right from the start, is meant to be an ever-changing camera depending on the user's purposes and goals. The definition I like is "Love". Love of film, Love of photography, Love of the products, Love to the customers...

Kazuto Yamaki on SIGMA fp L

SIGMA fp

Sensor: 24.6 MP (6072 x 4056) 35.9 x 23.9 mm Full Frame
Dimensions: 112.6 × 69.9 × 45.3mm / 4.4" x 2.8" x 1.8"
Weight: 422 g / 14.9 oz (with battery and SD card)
L-Mount: 20 mm FFD and 51.6 mm ID.

SIGMA fp L

Sensor: 61 MP (9,568 × 6,380) 36 x 24 mm Full Frame
Dimensions: 112.6 × 69.9 × 45.3mm / 4.4" x 2.8" x 1.8"
Weight: 427 g / 15.1 oz (with battery and SD card)
L-Mount: 20 mm FFD and 51.6 mm ID.

fp L Concept

"Leapin' Lizards!" Maybe "L" as in "Limitless," "Liberating," or "Lavorantissimo" (very hardworking)? When and how did the concept of the fp L camera begin?

We started the project right after we completed the development of the original fp. There were two main goals for this project. First, we aimed to improve the features and performance of the original fp. Second, we tried to enhance the performance and the ease of use by updating the hardware, such as the image sensor.

With regard to improvements that do not require a hardware change, we will implement them in the original fp via a future firmware update. The original fp will have several major feature updates including new color modes, saving settings to QR code, custom frame lines, and so on.

At the fp launch on July 11, 2019, you talked about the deconstruction of the digital camera. Now, 20 months later, is the fp L a reconstruction of that fp? Or an evolution? Or another deconstruction?

The original fp and fp L share the same concept. Therefore, fp L is also aimed to implement the deconstruction of the digital camera. I believe that, with the evolution of imaging technology, the boundaries between cinema cameras, still cameras, and video cameras will be breaking down further, and all camera manufacturers will need to think about the deconstruction of the camera in their own way.

I think you said that the fp came out of your wish to have a high quality camera that you would like to take everywhere. Please compare and contrast the fp and fp L in terms of the camera that you wanted (or that customers would also like to have).

Yes, you're right. The fp is the camera that I exactly wanted to make. I'm very happy to see the customers enjoy using the fp in several scenarios. I'm aware that it's been used on several film production, too. Thanks to its compactness, the fp allows the pro-duction team to shoot in extremely difficult situations, such as at the top of a mountain or in very narrow places.

The original fp has had several firmware updates since its launch. We continuously enhanced its movie capture functionality, including the support of BRAW and ProRes RAW via external recording devices. Therefore, as far as video capture is concerned, there's no difference between the fp and fp L. The fp L has a newly enhanced director's viewfinder function, including custom framelines and support for RED KOMODO 6K, but these functions will also be added to the original fp via future firmware updates.

With regard to still image capturing, the new 61MP sensor makes a significant difference. It gives the images a more 3 dimensional quality and adds more fidelity. Having a super high pixel count, customers can use fp L as a multi aspect ratio camera. They can use several difference aspect ratios or crop the images as they want without worrying that the resolution becomes too low.

Please expand on your ideas about style for this camera — and maybe for SIGMA in general. In many ways, your new I-series lenses, the SIGMA 28-70mm F2.8 DG DN Contemporary, and other lenses seem to embody a great commitment to style, form/function, and design sensibility — as well as superb technology and engineering.

Thank you very much. Yes, I have a great passion for product design and our engineers share the same passion. We share the same vision for product design. It must be simple, easy to use and aesthetic. And we believe that the exterior design shouldn't be decorative, but minimal. The best way to present the product to the customer is not to show off a fancy design, but to let the customer feel the quality. Therefore, we also try hard to make every single part with the highest precision so that customers can feel it. Therefore, we also strive to make almost every individual part in our factory in Aizu, in northern Japan, so that customers can appreciate not only the form, but also the function, quality and high precision.

Kazuto Yamaki on SIGMA fp L

SIGMA fp L
with SIGMA 28-70mm F2.8 DG DN | Contemporary lens

SIGMA fp L
with 28-70 F2.8 DG DN
and EVF-11.

How did you decide on a 61 MP sensor? That's a lot of resolution and a lot of data. Were there challenges? Heat? Data rates?

Yes, such high resolution increased the load on the processor. Our firmware team worked hard to enable fast data processing and to keep the UI smooth despite such a heavy load.

Initially, it seemed that the members of the L-Mount alliance were working together or thinking alike. For example, SIGMA fp, Leica SL and Panasonic S1H all seem to have 24 MP sensors.

Now, SIGMA fp L has a 61 MP sensor, while the others have 47 MP sensors. I'm not comparing, but simply wondering if you would you care to comment on how members of the L-Mount alliance decide on such matters?

I agree that our alliance maintains a great partnership. We respect each other and support our common goal to provide the best cameras and lenses to our customers. However, we never disclose each other's product roadmaps and remain independent.

We work together to make the camera system platform even better for the customers, but as far as the individual products are concerned, we're competitors as well. By keeping our alliance in a clean and healthy relationship, I believe that all three companies have successfully provided very attractive products to the customers.

I love, as in fp Love, the fp L's new user-defined frame lines and aspect ratios. Was this major feature a big user request?

We heard many strong requests from users. After we received their opinions and reasons, we truly realized that it's an essential feature. We really appreciate those who gave advice to us.

The EVF is brilliant. It's very sharp, great for focus, and helpful in being able to tilt from horizontal all the way to vertical. Please discuss the evolution of the EVF.

Since the launch of the original fp, we received many requests to make a dedicated EVF for it. There was a consensus at SIGMA that the viewfinder had to be great. We knew its importance from our experience with fine optical viewfinders (OVFs) in SLRs.

In order to achieve this, we chose a high resolution OLED panel and designed the high resolution viewfinder optics. We believe that we did our best to make EVF-11 an excellent one, but still, it is not yet as good as an optical viewfinder. Our goal is to make an EVFs even better than OVFs. I believe it's possible thanks to several great technology evolutions.

For which markets are the fp L cameras intended? DPs, Directors with Finders, location scouts, lens testers....?

One of the words that "L" signifies is "liberate," which we do not intend to refer to specific types of fp L customers, but rather in the sense that it lets users find how to use and enjoy the camera sys-tem. Depending on the accessories they choose, fp L transforms into any kind of camera, including a professional cinema camera.   Users are often more intelligent than manufacturers in regard to the usage of the camera. Therefore, I'm looking forward to seeing how customers find unique ways of using fp L.

Kazuto Yamaki on SIGMA fp L

Koichiro Tsujikawa and crew working on the SIGMA fp L stop-motion concept video.

Do you prefer for users to work with the camera in Still mode, or Cine mode, or Director's Finder mode with a cine lens and PL adapter?

For me personally, I normally use the fp L for still photography. As for film production, I'm very happy if it's used for any occasion or purpose. If users like the unique features of the fp series cameras and fully utilize them for film production, that means a lot to me. Cine or Director's Viewfinder modes are seamless.

Would you please comment on the beautiful fp L time-lapse intro video? *sigma-global.com/en/special/fp-series/*

The idea of the concept movie is to show the versatility of fp L, thanks to its super high resolution. As I mentioned earlier, having super high resolution can help users try image cropping and different aspect ratios without the concern of too much resolution loss.

This idea was developed by the director, Koichiro Tsujikawa, with whom we worked together for the concept movie of the original fp. He is very talented director and we have full trust in his creativity. Therefore, we did not give him any specific requests and we let him create the idea as he wanted to.

The music is written and played by Keigo Oyamada, known as Cornelius, the creative contemporary musician. Keigo and I were classmates in elementary school and junior high school in Japan, so I enjoyed working with him.

Koichiro Tsujikawa on the Concept Video

Koichiro Tsujikawa: SIGMA always asks me to create video content as I wish to. They did so when I made the first concept video for the original fp and it was the same this time, too. It's quite different from the projects with other companies, so I'm always thrilled to work with SIGMA. I truly enjoyed my work this time, too. For both videos, I aimed to make it simple, with powerful content so that the real essence of fp series can reach the customers. For the first video of the original fp, I presented a wide variety of transformations of the fp camera with several accessories and with the music synchronized.

This time, I also chose to create the video with the distinguishing creative sound of Cornelius in order to demonstrate that fp and fp L are based on the same concept and philosophy. And then, I wanted to portray what 61MP can do.

The concept is a stop-motion movie that consists of high resolution images taken with fp L. I wanted to show the super fine details of fp L images by cropping several parts of the images. The very first scene is cropped by a factor of 5 from the original image. And once it's zoomed out, you can recognize that many objects including fp, fp L, and other historical SIGMA cameras are moving around synchronously. It's a simple structure with a loop of approximately 50 images, but also it's very chaotic. Simple, but chaotic. I believe that it's exactly what the fp series embodies.

Keigo Oyamada (Cornelius) on the Music

Keigo Oyamada (Cornelius): I have been working with Koichiro for more than 25 years, so we share a common sensibility. We know what each other wants to achieve without particular explanations. Koichiro did not give specific instructon to me this time, either. We just agreed on a type of music so that one phrase loops nicely in this video. The first video had dynamism in the frame, so I put the beat in the sound; but this time, as one scene loops with different settings, I created a minimal sound without beat. Synchronization of video and music is the consistent theme in both videos.

SIGMA fp L as Director's Finder

SIGMA fp L as Director's Finder. Right side.

Deconstruct

de·con·struct | dēkěn'strěkt |
verb [with object]

Reduce (something) to its constituent parts in order to reinterpret it: *the design goal of the SIGMA fp was to* **deconstruct** *the concept of the digital camera. The new SIGMA fp L goes even further to* **deconstruct** *our preconceptions of style and function in a digital camera.*

Deconstruct the Digital Camera

Tokyo. July 11, 2019. SIGMA CEO Kazuto Yamaki introduced the original SIGMA fp camera. He said, "Our aim was to deconstruct the parameters of a digital camera and reconstruct it. And so, I am pleased to introduce the SIGMA fp.

"There are three key features. First, it is Pocketable Full Frame camera. Second, it is Scalable. Third, it is Seamless."

There were two additional key features that caught the attention of cinematographers: 12-bit RAW video recording and a Director's Finder mode.

SIGMA fp L

And now, there is the sequel. SIGMA responded to users' requests and introduced the new SIGMA fp L camera. It has an astonishing 61 Megapixel sensor, detachable pivoting EVF, infinitely adjustable framelines and a brilliant Director's Finder / DP Finder mode.

SIGMA fp L as DP Finder

SIGMA fp L as DP Finder, with pivoting EVF, MC-31 PL to L mount, SIGMA Classic FF 35mm T2.5 cine prime lens. Left side.

Reconstruct the Digital Camera: SIGMA fp L

Tokyo. March 25, 2021. The new SIGMA fp L has a removable, tiltable EVF, user-definable framelines, and image screenshots with text metadata. The fp L is stylish, small, versatile and a pleasure to use.

This article should begin with joyful noises about the SIGMA fp L camera's capabilities as an amazing still and cine camera. But, cut to the chase —this is one of the best Director's Finders you could possibly find.

Thanks to its new SIGMA EVF-11 OLED pivoting viewfinder, the fp L becomes an incredibly helpful Director's Finder. And because it's digital and not an analog/optical/groundgrass device, the 61 MP Full-Frame fp L sensor offers a WYSIWIG view of the world, even at ISO 25,600 with light levels so low you can barely see your outstretched hand holding the finder.

The modular, 0.5-inch, 3.68 million dot electronic finder attaches easily to the fp L camera's left side. The adjustable diopter eyepiece swivels from horizontal all the way to full vertical.

DP Finder

The fp L could get a new name: DP Finder. This is no badge-of-office traditional Director's Finder dangling from the neck on a silver chain. It does lots more than line up a shot. This is a serious and seriously small Full Frame, multi-purpose camera. It shows real angles of view and depth of field with its own lenses, or your actual shooting lenses, on the tech scout or on the day. The fp L also shoots beautiful 61 MP stills (for background plates, BTS, portraits, landscapes, location scouting, coffee-table making-of-the-movie book) as well as spectacular 12-bit 4K RAW cine. And so, the DP Finder might very well wind up filming after finding: not only as a finder but also as a cine camera capable of working as A-camera or additional camera.

SIGMA fp L Deconstructed

SIGMA fp L. Deconstructed, it is the world's smallest 61-megapixel camera with a CMOS image sensor. Next, reconstruct with additional accessories for stills or cine.

EVF-11 electronic viewfinder. 0.5-inch, 3.68 million-dot OLED. 21 mm eyepoint, 0.83x magnification. Diopter adjustments -4 to +3. Tilts 90 from horizontal to vertical.

Samsung SSDs for 4K RAW recording up to 12-bit CinemaDNG.

USB-C 3.1 Gen 2 connector.

L-R:
T5 2TB SSD 540 MB/s

T7 1TB SSD 1,000 MB/s (PCIe NVME technology).

LanParte SSD T5C holds one SSD

USB-C 3.1 Gen 2 cable connects directly to fp L camera.

SIGMA MC-31 PL to L-Mount adapter.

The MC-31 flange depth is adjustable with shims.

A stopper pin can be released with a 1.5 mm hex driver so you can tighten the breech lock further.

The ¼-20 threaded bottom support convenient accepts a handle.

There a countless ways to customize your handle.

From left to right: Camvate Handgrip with ¼-20 and 3/8-16 sockets; SIGMA Base Grip BG-11 double handle; SIGMA BG-11 single handle.

Other handgrips come in carbon fiber, wood and bicycle style grips in leather or rubber.

Be sure there is a 1/4-20 thread on one end to screw into the fp camera body or the MC-31 PL-L-Mount Adapter.

SIGMA BG-11

SIGMA fp L – f PL

Above: SIGMA fp L with EVF-11 3.68 million-dot OLED Viewfinder, SIGMA MC-31 PL to L-Mount adapter (and SIGMA 35mm T2.5 Classic Art Prime lens.)

The fp L (and fp) cameras are fitted with an L-mount.

As with the other L-Mount alliance members (Leica, SIGMA, and Panasonic), the flange depth is 20 mm and the inside diameter is 51.6 mm. This makes it a breeze to add PL, LPL, PV, SP70, M, EF, F, Mitchell or any other adapter you need.

Below: This SIGMA LVF-11 Viewfinder came out with the original fp, but works on fp L as well. It is basically a magnifier with a diopter to view the camera's rear 3.5-inch TFT LCD screen (approx. 2.1 M dots).

FF High Speed Prime with PL mount.

MC-31 PL to L-Mount Adapter

SIGMA BPL-11 baseplate

LVF-11 LCD Viewfinder with adjustable diopter eyepiece

SIGMA fp L Director's Finder

Unlimited Frame Lines

Maybe the "L" in fp L stands for "Lines."

SIGMA fp L answered the prayers of DPs and Directors everywhere: "Please add user-defined frame lines and aspect ratios."

SIGMA engineers did just that: with an elegantly simple menu screen to enter any ratio and image size you want.

Direct numerical entry of any aspect ratio.

It works in familiar film-style ratios of xx.yy : 1
You can also enter the aspect ratio as a whole number head-scratcher style such as 22:8 (2.75:1 — almost 2.76:1 Ultra Panavision 70, as in *Ben-Hur* and *The Hateful Eight*.)
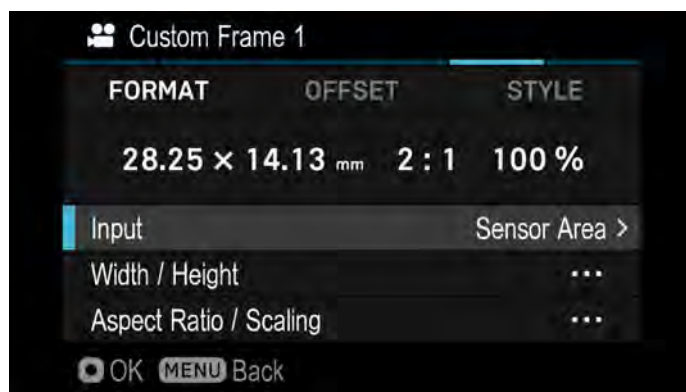
You can also enter aspect ratio defined by actual sensor area in mm. In this example, we want to use the fp L finder to scout a scene to be shot with an ALEXA SXT with an aspect ratio of 2:1. We know that the ALEXA's sensor is 28.25 mm wide and the height will therefore be 14.13 mm.
Navigate to STYLE for frameline color and width. OFFSET repositions the framelines.

SIGMA fp L Director's / DP Finder (fp DP)

The Custom Frame STYLE menu offers choices of:
- Frameline appearance (Full Box, Corners, Top-Bottom, Left-Right)
- Frameline thickness
- Frameline color
- Shading (masks outside picture area)

Director's Finder mode matches ARRI, SONY or RED camera sensor modes to SIGMA fp L.

You can view Custom Frames and Director's Finder framelines at the same time—sort of a mix and match approach.

SIGMA fp L

SIGMA fp L with EVF-11. Actual size.

SIGMA fp L 61 MP Camera

But what about the new camera itself, you may ask.

Not forgotten in all the panegyric polytechnics of its Director's Finder abilities, the deconstructed fp L is itself a protean photographic and cinematic delight.

SIGMA Corporation's CEO Kazuto Yamaki announced on March 25, 2021 that the SIGMA fp L is the world's smallest and lightest full-frame digital single-lens mirrorless camera with a full-frame Bayer sensor with approximately 61 effective megapixels.

When the original fp made its debut, we were guessing what the letters meant. Was it film-photo? It turned out to be a philosophy based on music: *fortissimo—pianissimo*. *Fortissimo* in music means to be played very loudly. *Pianissimo* means to be played very softly. With the new fp L, it turns out that "L" stands for Leap or Love of Photography. But Italian superlatives are always welcome: *Luminescentissimo* (very bright), *Leggendarissimo* (very legendary), *Lussureggiantissimo* (very luxuriant), or *Leggierissimo* (very light).

The fp Lcamera continues SIGMA's fp development concepts containing lots of "s" words: **smallest** and lightest pocketable full-frame camera; **seamless** STILL/ CINE switch and **scalability**.

The optional EVF-11 OLED electronic viewfinder is what everyone, without the close-focus vision of a 12-year-old nose-to-nose with an art project, hoped for. In keeping with Mr. Yamaki's wish for a camera he could bring on trips everywhere and that fit in his pocket, the EVF detaches and attaches easily.

SIGMA fp L is expected at SIGMA authorized dealers in mid-April 2021.

US pricing: SIGMA fp L $2,499
EVF-11 Viewfinder $699
SIGMA fp L + EVF-11 Bundle $2,999

What's New? SIGMA fp L New Features

• 61 Megapixel full-frame, back-illuminated Bayer CMOS image sensor. Equipped with a low-pass filter to reduce moiré.

• New hybrid (phase detect + contrast detect) autofocus system enhances AF speed and tracking ability.

• USB-C continuous power. The fp L can be charged via the USB-C connector while the camera is powered on. This is helpful, for example, on uninterrupted time-lapse photography or extended use as a high-quality webcam for streaming.

• EVF (Electronic Viewfinder). The new SIGMA EVF-11 Electronic Viewfinder has a 0.5-inch, 3.68 million dot OLED display. It is sharp and smooth when viewing video motion. The EVF-11 comes as an (essential) accessory or bundled with the fp L. The EVF-11 works with both the fp and the fp L cameras. For the fp, a future firmware update will become available.

• True 24p recording as well as 23.98p.

• As a very expensive webcam, fp L looks beautiful. Connect a USB-C cable from camera to computer, set CINE mode and USB Mode to Video Class UVC.

SIGMA fp L

Actual size.
Under 2 lb. 32 oz. 902 grams.
SIGMA fp L pairs exquisitely with the new ultra-compact,
ultra-light SIGMA 28-70mm F2.8 DG DN | Contemporary Zoom.

• Crop Zoom function is available in both STILL and CINE modes. It's on the 2nd page of the Menu and can be assigned to a dial. In Still mode, you can crop up to 5x. This is like a digital zoom, so if you're shooting with a 24mm DG DN SIGMA I series Prime, the 5x crop provides the magnification equivalent of a 120mm telephoto. You don't lose any light and depth of field remains the same as with the original 24mm focal length.

Resolution decreases, of course, but that's the beauty of beginning with a 61 MP sensor image with a 9520 x 6328 resolution. Cropped 5x, it results in the equivalent of a 12.2 MP sensor area and 3840 x 2552 resolution.

Cropping get really interesting in CINE mode. Maximum crop is 2.5x. Full-Frame uncropped records the entire sensor area and downsamples it to 3820 x 2160 UHD 4K. And yet, 2.5x crop zoom also results in a 3820 x 2160 UHD 4K image. (It's 4096 x 2160 DCI 4K RAW when recorded externally via HDMI).

• Save and share custom camera settings. SIGMA fp L settings can now be saved as a QR code image. This QR code makes it easy to save, share and load custom settings.

• True 24p recording. The fp L can now record in actual 24p as well as 23.98p.

• Director's Viewfinder. As heralded on previous pages, the fp L as a Director's Viewfinder is vastly improved with custom, user-defined framelines. The screenshot function saves camera and lens settings as readable text in both still and cine captures. TAs a Director's Finder, the fp L works with both the LVF-11 and new EVF-11 viewfinders.

In addition to custom framelines, you can also match the field of view of the actual sensor size or film gate of popular cine cameras. The fp L has framelines for ARRI Arricam, Arriflex 3-perf / 4-perf, ALEXA LF / Mini LF / Mini /65 / SXT / XT, and AMIRA. Also, Sony VENICE; RED MONSTRO 8K / HELIUM 8K / DRAGON 6K / EPIC MX 5K / GEMINI 5K / KOMODO 6K. In a nutshell, the matching cine camera image area has to be less than or equal to the fp L.

• Screenshot. Simultaneously press the Display Button and the OK Button to grab a screenshot of the fp L camera's LCD screen for a visual reference of the image and all the visible text parameters and metadata: for example: timecode, fps, shutter angle, aperture, ISO, color temperature. All cameras should have this: instantly gratifying visual metadata.

Screenshots are saved as low-rez 1024x682 reference jpegs to the internal SD card, for example in the DCIM > 100SIGMA folder with a filename such as SS_0041.JPG.

• New Duotone and Powder Blue color modes. There are now 15 choices of color modes for both stills and cine: Standard, Vivid, Neutral, Portrait, Landscape, Cinema, Teal and Orange, Sunset Red, Forest Green, Powder Blue, FOV Classic Blue, FOV Classic Yellow, Duotone, Monochrome, and Off. These are essentially in-camera looks baked into the image. Powder Blue color mode is a light, cyan-toned image with a crisp, cool, Scandinavian style.

Aspect Ratios, Framelines and DP / Director's Finder

Like a good sommelier, the SIGMA fp L offers you many excellent choices and ways to pair the menu with your style of working. Frame Guides and Director's Finder are two different ways to compose shots, scout locations, and match the field of view in your fp L with another cine camera that ultimately will shoot the scene. I think you'll like Frame Guides—for reasons that follow.

Frame Guide (Framelines)

1. You can set up to 5 framelines to display concurrently. Three are pre-ordained: 1.33:1, 1.85:1 and 2.39:1. Two are user-definable, which is super helpful.
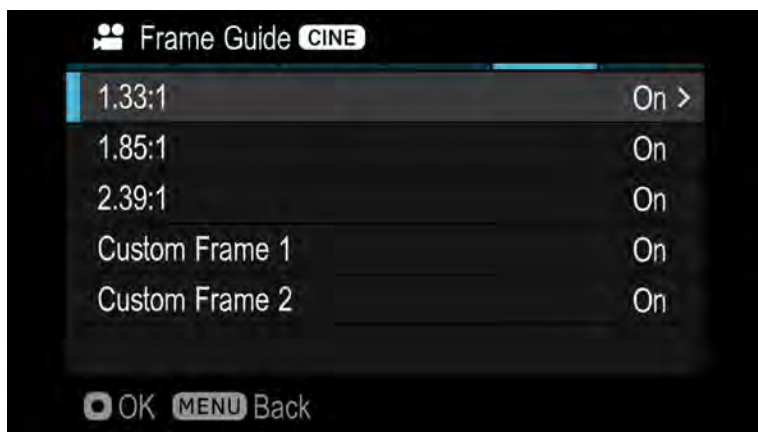
2. Turn the framelines on and off here. For example, you may want to compose for 2.39:1 for theatrical release and 2:1 for Netflix.
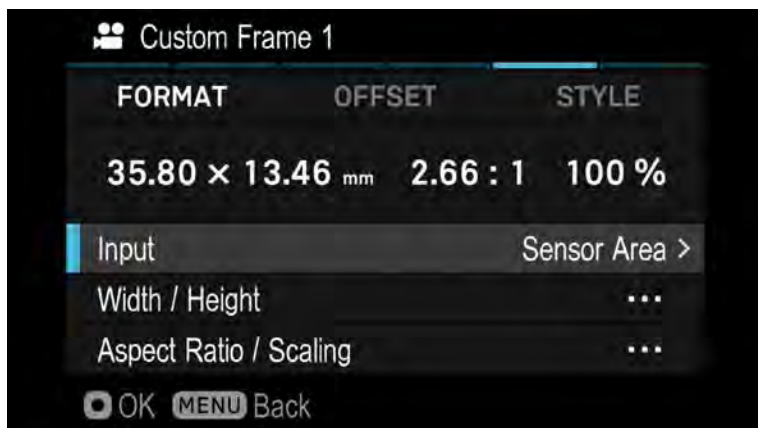
3. Custom Frames are like a powerful internal frameline generator. Set sensor dimensions or scaling, for example to match the field of view of the fp L with the sensor size of an ALEXA. Offset lets you match common headrooms. Style adjusts color, thickness and shape of the frame lines.

DP / Director's Finder

4. DP / Director's Finder mode is like a Cliff's Notes version of Frame Guides. Instead of calculating size and shape, you simply enter the cine camera to match. Choices are Sony, ARRI and RED.

5. The Finder view above, in image #4, shows a RED MONSTRO 8K VV in 4K FF sensor mode. This view shows the MONSTRO in 6K FF mode.
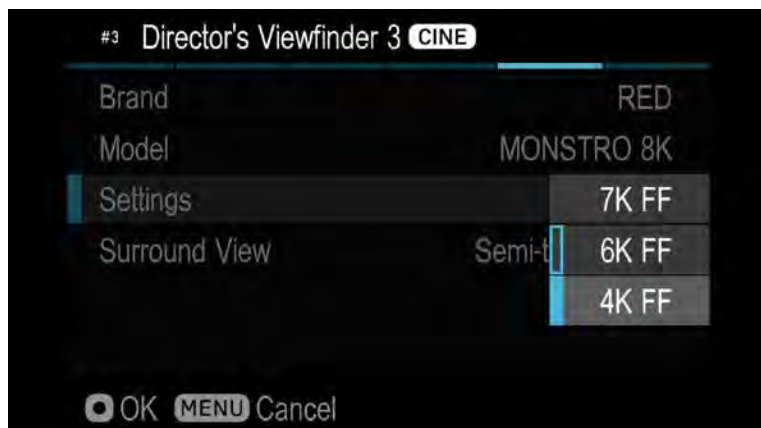
6. Since RED MONSTRO in 8K FF sensor mode is bigger than what the SIGMA fp L can provide, it's not shown here. (RED 8K VV image area is 40.96 x 21.60 mm. SIGMA fp L image area is 36 x 24 mm.) So, time for Frame Guides and aspect ratios on the fp L, knowing that the extra 4 mm of RED sensor width is not a cause for peripheral concern.

fp L Screengrab Function

When using the fp L as a Finder in CINE mode, press the Red REC button to capture the scene in video. Or press the shutter button to capture a still. Be sure to set SHOOT > Shutter Button Settings (CINE) > Shutter Button Functions (CINE) > Shutter. This results in a clean image, without framelines.

For a Finder image with framelines, use the SCREENGRAB function to capture a still with framelines and all the settings as text. First press the DISPLAY Button and then the TONE, COLOR, MODE or OK Button.

OK button

First press the DISPLAY button

Then press the TONE, COLOR, MODE or OK button
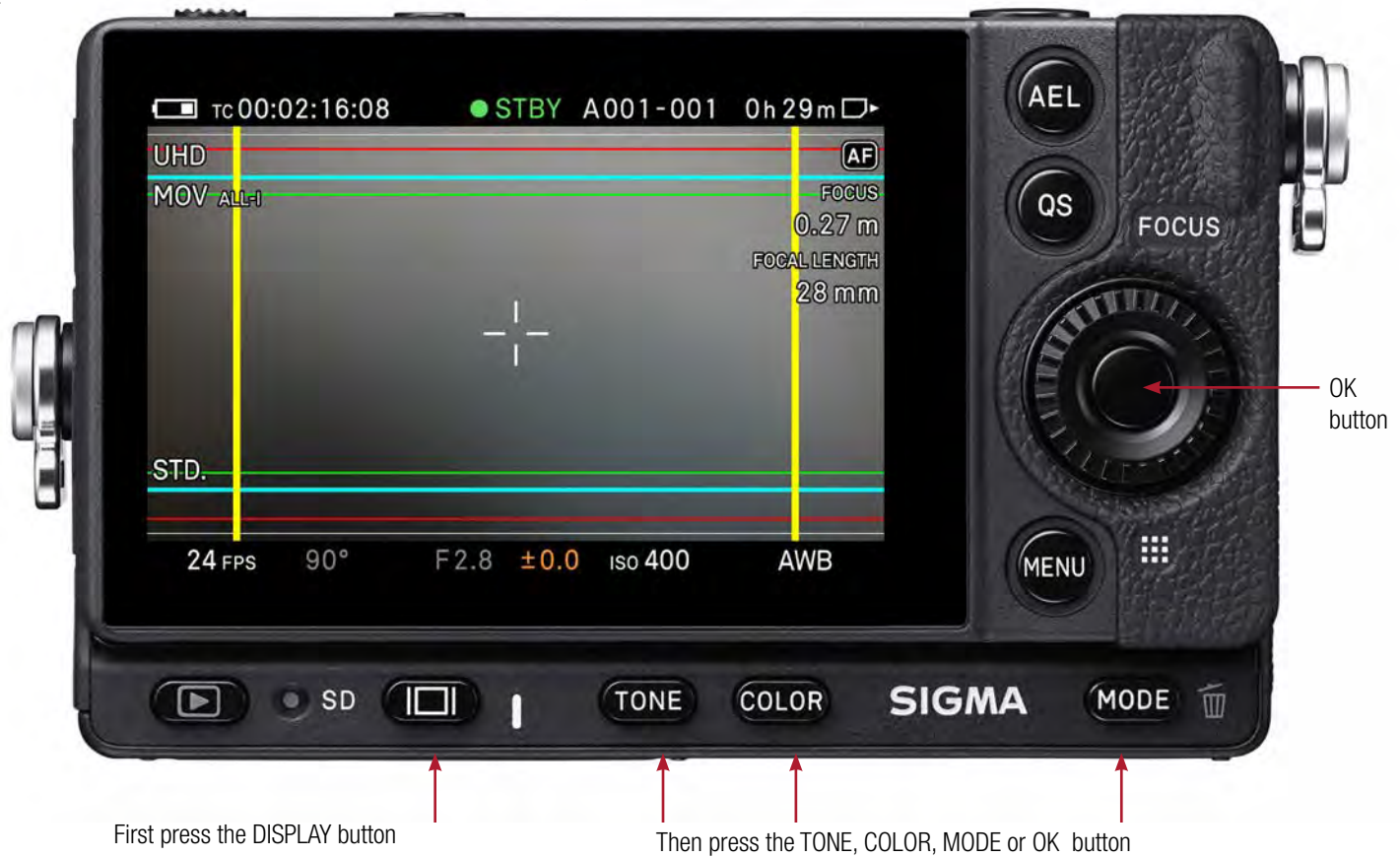
Screengrab with in-shot display data turned to MINIMAL. Single frameline adjusted to thin width and no crosshair.
Because this was shot with a PL to L-Mount adapter, the lens metadata is not displayed. Remaining data is out of frame: fps, shutter, F-stop, ISO, Color temperature, etc.

Screengrab with multiple framelines, record settings and lens data displayed. This setup is helpful for scouting. You can return at a later date and match focal length. Note: focal length and focus distance only show up if you're using an L-Mount alliance lens.

And then you can slide the top switch of the camera from CINE to STILL and shoot a 9520 x 6328 photo, which is 31" wide x 21" high at 300 dpi and blows up way larger. See following two pages.

SIGMA fp L with 28-70 DG DN
at 28 mm, F3.2, 1/1000 sec, ISO 200
from 105.68 MB DNG RAW file.

What's similar between SIGMA fp and fp L?

SIGMA fp

SIGMA fp L with EVF-11 and T5 SSD
for external RAW recording

SIGMA fp with 45 mm F2.8 DG DN I-series lens

SIGMA fp L with 28-70 F2.8 DG DN,
EVF-11 and T5 SSD

• Identical body design. SIGMA fp and fp L have the same exterior body dimensions, connector placement and control layout.

• The L-Mount has a flange focal depth of 20 mm and an inside diameter of 51.6 mm. The L-Mount is the same type used on Leica SL, SL2, CL, TL and Panasonic S1 series mirrorless cameras. So you can work with an already substantial and increasingly large inventory of L-Mount lenses from SIGMA, Leica, Panasonic and others.

• Open 3D schematics enable OEM and aftermarket accessories to be used on both cameras.

• Compatibility with growing family of L-mount lenses from SIGMA, Panasonic and Leica. Also, you can attach EF lenses with SIGMA's MC-21 EF-L mount adapter and PL lenses with SIGMA's MC-31 PL-L adapter.

• Both camera bodies are dust resistant and splash-proof. The bodies are machined from aluminum die-cast housings and have a large, fan-free heat dissipation system.

• No mechanical shutter. Completely silent shooting.

• USB webcam support as described earlier. The fp requires a firmware update to do this.

• 24 fps frame rates for fp camera will require firmware update.

• MOV, CinemaDNG, ProRes RAW and BRAW recording.

• 4K UHD All-I and GOP MOV at 22.98, 24, 25, 29.97 fps.

• Full HD All-I and GOP up to 119.88 fps .

• Internal 8-bit CinemaDNG to 4K UHD at 23.98, 24 and 25 fps.

• 12-bit CinemaDNG uncompressed UHD 4K at 23.98, 24, 25, 29.97 on external SSD via USB-C.

• Blackmagic RAW and ProRes RAW via HDMI output.

• Dual base ISO automatically sets from from 100-1250 and 1250-25,600.

• Time code input.

SIGMA fp L 12-bit RAW 4K External Recording

SIGMA fp L with
Atomos Ninja V 5"
Recording Monitor

SIGMA fp L with
Blackmagic Video Assist 5"
12G monitor/recorder.

The SIGMA fp L can record Blackmagic RAW (BRAW) via its HDMI output to a Blackmagic Video Assist 12G 5" or 7" monitor/recorder.

SIGMA fp L also supports the Atomos Ninja V Recording Monitor for Apple ProRes RAW recording via HDMI.

Update everything to the latest firmware releases for external recording up to 12-bit RAW:

- 4K DCI 4096 x 2160 at 24p.
- 4K UHD 3840 x 2160 at 23.98p, 24p, 25p, 29.97p.
- FHD 1920 x 1080 at 23.98p, 24p, 25p, 29.97p, 50p, 59.94p, 100p, 119.88p.

If you connect an external monitor/recorder like the Blackmagic Video Assist 12G or Atomos Ninja V, you'll notice that they feed from the HDMI connector. So, you will most likely be operating off the monitors, since SIGMA's EVF-11 is essentially locked out.

In the fp L menu, go to: SYSTEM > HDMI Output > Recorded Image Output > RAW and DCI 4K 4096 x 2160.

SIGMA fp L 12-bit RAW UHD Recording to SSD

Samsung SSD T7 Drive

USB-C connector

An advantage of using the fp L's HDMI output is that you can record 4K DCI 4096 x 2160.

The disadvantage is you can't plug in the EVF.

Fortunately, the USB-C connector of the fp L and fp provide uncompressed CinemaDNG output. With the EVF-11 attached, the USB-C port is nicely extended to the viewfinder body.

It's not 4K DCI; it's a few pixels less—4K UHD 3840 x 2160.

I like to record to a slim Samsung SSD T7 1TB drive attached to the fp L with a LanParte or SmallRig drive cradle.

This is an extremely compact, satisfying and salubrious setup for shooting RAW.

SIGMA fp L can record CinemaDNG up to 12-bit UHD 3820 x 2160 at 23.98, 24, 25 or 29.97 fps.

SIGMA's published data rates show 2400 Mbps at 24 fps UHD RAW (*tiny.cc/fpL-Mbps*).

That's 12.5 Megabytes per frame and 300 Megabytes per second. So a 1 TB drive will hold 3,333 seconds, or 555 minutes of CinemaDNG RAW 12-bit recording.

fp L records CinemaDNG up to 12-bit UHD 23.98, 24, 25 or 29.97 fps externally via USB-C — or to internal SD card up to 8-bit UHD 24 or 25 fps.

fp L records CinemaDNG up to 12-bit UHD 23.98, 24, 25 or 29.97 fps externally via USB-C — or to internal SD up to 8-bit UHD 23.98, 24 or 25 fps.

SIGMA EVF-11

Attach the EVF-11 to fp L:

Remove the fp L rubber HDMI cover. It has a nice nesting place on the EVF itself—in the recess marked "HDMI."

The USB-C rubber cover remains on the camera. Fold it forward as you screw the EVF onto the camera.

Remove eyecup to access diopter adjustment

Empty HDMI cover storage cut-out

HDMI cover goes here

Switch between EVF and LCD viewing

1/4-20 mount

USB-C socket for external SSD

2.5 mm headphone socket

USB-C

Power

HDMI

Blackmagic Pocket Cinema Camera 6K Pro

Blackmagic Pocket Cinema
Camera Pro EVF

1280 x 960 3.68 million dot,
 24-bit OLED with
-4 to +4 diopter adjustment

RECORD
Start - Stop

Built-in
microphones

Built-in
microphones

EF lens mount
44 mm FFD,
54mm ID Ø.

6144 x 3456 CMOS sensor,
23.10 x 12.99 mm image area
Super35 format,
1.78:1 native aspect ratio.

EF lens mount electronic pogo
pin contacts for lens data,
power, autofocus, OIS image
stabilization, etc.

If you only need three reasons to upgrade or buy a Blackmagic Pocket Cinema Camera 6K Pro, here they are:

1. Optional (essential) 1280 x 960 color OLED viewfinder.

2. Built-in Clear, ND.6, ND1.2 and ND1.8 filters.

3. The 5" LCD Monitor tilts up and down.

Blackmagic's design team undoubtedly listened to user requests. They added enough good things to the popular Pocket Cinema Camera 6K to name it "6K Pro."

It is not completely the same body. The PCC 6K Pro is 1.04" inches taller than the PCC 6K, 0.41 inch deeper, and 0.08 inches wider. At 2.73 lb, it is 0.75 lb heavier, which is still very lightweight.

Pro EVF

The new Blackmagic Pocket Cinema Camera Pro EVF is an essential option. Unscrew a small cover on top of the camera and this 2.82 ounce, 1280 x 960, 3.68 million dot, 24-bit OLED EVF with -4 to +4 diopter adjustment adds 1.91 inches to the overall camera height. The EVF attaches to the top of the camera with a single connector. You can tilt it up to 70 degrees. Four different eyecups provide comfortable configurations.

6 Stops of Internal ND Filters

The Blackmagic Pocket Cinema Camera 6K Pro has a built-in 4-position motorized ND filter assembly with Clear, ND.6, ND1.2 and ND1.8 filters (Clear, 2, 4 and 6 stops of light reduction).

This is a nice feat of engineering for such as small camera. Somehow they managed to squeeze an internal, motorized ND filter mechanism between the Canon-style EF mount and the Super35 6K sensor.

The motorized ND Filter assembly consists of two clear filters and two IRND filters. There will always be 2 filters stacked together to maintain consistent back focus.

When you choose CLEAR (no light loss), there are 2 clear filters in position. When you set ND.6 (2-stops) or ND1.2 (4-stops), there is a clear and one of these two NDs engaged. For ND1.8 (6-stops), the 2-stop filter is stacked together with the 4-stop filter.

Blackmagic Pocket Cinema Camera 6K Pro

Blackmagic Pocket Cinema Camera Pro EVF.

+ and - buttons to control built-in motorized 2, 4 and 6 stop ND filtration.

5" HDR 1500 nit LCD screen tilts to 90° up and 47° down.

The filters can be engaged and changed with the + and – buttons on the upper right rear side of the 6K Pro. You can set the menu to show how you'd like to see these filter settings displayed: as ND, stop reduction or fraction.

Tilting Touchscreen Monitor/Menu

The 5" LCD touchscreen HDR monitor at the back of the camera has been improved. It is brighter: 1500 nits. It tilts up 90 degrees from vertical to horizontal. This lets you handhold the camera conveniently at waist level or operate low angle shots without contorting your body to view the shot. The monitor also tilts down 47 degrees, which is great for high-angle ladderpod shots or holding the camera high above a crowd.

NP-F570 Battery

The Pocket Cinema Camera 6K Pro uses a bigger battery for longer runtime: a Sony style NP-F570. It runs the camera for about 60 minutes when recording 6K RAW at 24 fps to a CFast 2.0 card and with the monitor at 50% brightness.

An optional battery grip/pack attaches to the bottom and extends camera run-time even longer.

(The Blackmagic Pocket Cinema Camera 4K or 6K uses a Canon-style LP-E6 type battery. It can run the Pocket 6K for about 45 minutes.)

Power

The external AC power supply that comes with the camera can run it and charge the battery simultaneously. Also, the USB-C connector can trickle charge the battery. This is helpful in a pinch to be able to use portable battery packs, mobile phone chargers or laptops to top up the camera battery.

Sensor

The 6K, 6144 x 3456 Super35 format sensor measures 23.10 x 12.99 mm — same as the Pocket 6K Camera. Dual Native ISO settings are 400 and 3200 ISO. You can go up to up to 25,600 ISO.

Audio and Timecode

The 6K Pro Camera has two mini XLR audio inputs on the left side. (Previously, the 6K Camera only had one audio input.)

These mini XLR connectors, for microphones such as lavs or mini shotgun mics, are menu-switchable between +48 volts of phantom power and line level up to +14dBu. The two mini XLR connections provide two separate audio tracks without the need for an external mixer.

There are also four microphones built into the front of the body (behind the cool-looking perforated metal grilles). They are shock and wind resistant with an exceptionally low noise floor. There's a built-in speaker for playback and a 3.5 mm headphone jack.

Blackmagic Pocket Cinema Camera 6K Pro

EVF tilts up to 70° from horizontal position.

5" LCD touchscreen HDR monitor tilts up 90° from vertical to horizontal. It also tilts down 47° from vertical.

3.5 mm Mic or Line Audio Input. Also Timecode IN for jam-syncing.

3.5 mm Headphone Output.

Full-size HDMI Output: for Monitoring with or without text and 10-bit 4:2:2 1080p HD video monitoring or external recording.

USB-C connector: up to 5 Gb/sec for recording to external drives—also to recharge battery and update software.

External 12-20 V DC Power Input and Battery Trickle Charge.

Mini 3-pin XLR Mic and Audio Input 1.

Mini 3-pin XLR Mic and Audio Input 2.

Blackmagic Pocket Cinema Camera 6K Pro

On the left side, above the XLR inputs, there is a 3.5mm audio input for a stereo microphone. This 3.5mm mic input also accepts SMPTE timecode from an external source on the left channel. Valid timecode is detected automatically and embedded in the video file as timecode metadata. So, you can jam-sync the camera's internal timecode generator by using, for example, an Ambient NanoLockit or Tentacle Sync unit. You can disconnect the jam-sync device, but as with any camera, it's a good idea to reconnect it occasionally during the day to minimize any timecode drifts.

XLR Input 1 or 2 can also be used for timecode in the same way. They provide a secure, mechanically locking connection. Unlike the 3.5mm input where timecode detection is automatic, the XLR input requires you to select XLR timecode input in the menu to enable detection.

Camera Body

The camera body is made of lightweight carbon fiber polycarbonate composite. The handgrip has convenient controls for recording, ISO, White Balance and shutter angle.

Recording

Blackmagic Pocket Cinema Camera records 10-bit Apple ProRes files in all formats up to 4K or 12-bit Blackmagic RAW in all formats up to 6K. All models let you shoot up to 50 fps in full resolution (1.78:1), up to 60 fps in 6K 2.39:1 or 120 fps windowed.

Record to CFast and SD UHS-II cards internally.

The USB-C connector (expansion port) enables recording directly to an external flash or SSD drive. This is suggested for 4K DCI Blackmagic RAW 3:1 up to 60 fps and for longer recording times. Blackmagic has a support page with recommended drives: *blackmagicdesign.com/support/faq/59030*

Stills and Video

If you shoot both stills and video, the Blackmagic Pocket Cinema Camera 6K Pro (and 6K) have a still photo button for capturing 21.2 megapixel DNG still files. A camera icon appears briefly in the top right corner of the touchscreen display to let you know that you have successfully captured the still. Image files are saved to the STILLS folder in the root directory of the media to which you are currently recording.

Blackmagic Pocket Cinema Camera 6K Specs

- 6144 x 3456 sensor with 13 stops and dual native ISO up to 25,600.
- 10-bit Apple ProRes files in all formats up to 4K or 12-bit Blackmagic RAW in all formats up to 6K.
- EF lens mount, active and fully functional with EF enabled lenses.
- Built-in motorized 2, 4 and 6 stop ND filters.
- Dual native ISO 400 / 3200. Up to 25,600 ISO.
- 5" HDR 1500 nit LCD screen tilts to 90° up and 47° down.
- Blackmagic Generation 5 Color Science.
- Optional (essential) Blackmagic Pocket Cinema Camera Pro EVF.
- Two mini XLR inputs with 48 volt phantom power.
- NP-F570 battery.
- Optional Blackmagic Pocket Camera Battery Pro Grip.
- Carbon fiber polycarbonate composite.
- Includes full DaVinci Resolve Studio.
- Blackmagic Pocket Cinema Camera 6K Pro US$2,495, excluding local duties and taxes, from Blackmagic Design resellers worldwide.
- www.blackmagicdesign.com

Blackmagic Pocket Camera Pro Grip

The Blackmagic Pocket Camera Battery Pro Grip extends your shooting time to 3 hours. It's an ergonomic addition to the camera and only adds about 1 lb 7 ounces to the total weight, with batteries. Total weight of camera, grip and 3 batteries is 4 lb 10 oz.

Unscrew and remove the small plate covering the pogo pin contacts. If it's difficult to extract, a piece of gaffers tape will help to lift off the cover. Store the cover in the convenient receptacle on top of the battery grip.

The battery grip holds two NP-F570 batteries. Because the third NP-F570 remains in the 6K Pro camera, you can hot-swap the batteries in the grip.

Blackmagic Pocket Cinema Camera 6K Pro PL Mount

Above left: One of Vance Burberry's PCC 6K Pro cameras with PL mount by Wooden Camera. Above right: Wooden Camera PL mount kit.
Below: Vance at Hollywood Bowl with PCC 6K Pro and Wooden Camera PL mod at the end of an Angénieux Optimo 24-290 zoom.

Blackmagic Pocket Cinema Camera 6K Pro comes with a Canon-style EF mount.

If you're like Hollywood DP Vance Burberry, you might want to use PL mount lenses. Now you can—with Wooden Camera's PL Mount Modification Kit for Blackmagic Pocket Cinema Camera 6K.

Minor surgery is required, but with Wooden Camera's clear video, included tools and the Pocket Cinema Camera 6K's thoughtful design, the process is simple, relatively quick and actually fun. The PL Mount is made of stainless steel and aircraft grade aluminum and includes a PL cavity cap. Shims are provided.

The modification is reversible if you want to go back to EF mount. However, Wooden Camera cautions that switching back and forth may eventually strip the threads in the camera.

If you are not fond of "minor assembly required," you can have the nice folks at Wooden Camera perform the modification for an additional $250 on top of the PL mount's reasonable cost of $499.

Most modern Super35 PL lenses will fit. However, lenses that protrude more than 40 mm from the PL flange will not fit. See Wooden Camera's Compatible PL Lens Chart online: *tiny.cc/BMDPCC6K*

Florent Piovesan in the Antarctic

Florent Piovesan in Antarctica

Florent Piovesan is a filmmaker who grew up in Grenoble and is currently living in the French Alps. He spent 10 years in Australia, where he met Amberly, his wife and creative partner. His work has been in National Geographic Traveler, Outside Magazine, Red Bull AU. Florent is represented by FILMSUPPLY for stock footage licensing.

Jon Fauer: Please tell us about your job in the Antarctic.

Florent Piovesan: Since I was six years old, it has always been my dream to go to Antarctica. An outdoor photographer and good friend, Matt Horspool, had secured a cabin on a ship going to Antarctica. I got the green light to go only six days before the ship was to set sail on March 15, 2020.

Six days in advance of a trip to Antarctica is not much time to assemble all the gear and get the required documents. The gear had to travel with me as airline luggage. I flew from Australia to Ushuaia in Argentina. We spent 7 days in Antarctica. We crossed the stormy Drake passage twice. It was very interesting.

Tell us about your camera, lenses and gear.

My main camera was the Blackmagic Pocket Cinema Camera 6K. I have many EF lenses from my still photography activities--pretty much all Canons. So, the 16-35 F4, 24-105 F4 and 70-200 F4 Canon zoom lenses. I have a Sigma 18-35 F1.8, which is the one that I use for interviews or on a gimbal.

About a year ago, I started getting prime lenses, and I decided on Contax ZEISS. It took about 6 months hunting and looking for them. I've got an 18mm F4, 28mm F2.8, 15mm F 1.4 and an 85mm F2.8. They are lenses that I share with the Blackmagic Pocket Camera 6K as well as my EOS R.

During our week in Antarctica, we ended up capturing a lot of content: about 4,000 to 5,000 clips. The days were long. I've been to cold places before, but it's quite different Antarctica. The wind is very harsh, quite dry, and you always have to be aware of wildlife. Sometimes we would actually get stuck because we'd have penguins all around us and they would come to us and we couldn't get up because they need to be the ones that go away from us not us crossing their path. We got caught one time for 40 minutes and we didn't move. I was on the rock and I just had to wait for them to go.

How cold was it? What were you wearing and did you have to wear gloves while you were operating the camera?

We were there at the end of summer. Temperatures were cold, definitely minus, but honestly, I've been colder in New York. We had big expedition jackets and Gore-Tex pants. I only had Icebreaker thin merino gloves to be able to use the touch screen on the camera. The expedition leaders were asking me, "Are you sure

Florent Piovesan in the Antarctic

PBE-BMPC6KP CoreSWX battery under Pocket Cinema Camera 6K Pro.

Antarctic Outfit:
Blackmagic Pocket Cinema Camera 6K; 3 Canon zoom lenses; Canon EOS R for stills and backup, DJI Osmo Action. Manfrotto 190 carbon fiber (rarely used). JOBY GorillaPod. SmallHD 5-inch monitor (upgraded to 7-inch after the trip.) Sennheiser and the Rode mics. Many USB-C cables for the hard drives. 6 small Canon batteries and the big Core SWX. Macbook Pro. Zhiyun Weebill S gimbal. WANDRD PRVKE travel camera bag is comfortable and holds the complete camera package.

---

you're ready to go out with just merino because it's really cold and you're going to be there for hours."

I'm used to the cold and with big gloves, I can't shoot, I can't press the buttons. I can't unplug cables. But because we were running around so much, we only had between an hour and a half and three hours at each location. We were doing one landing in the morning, one landing in the afternoon and in between was just time enough to eat and to charge the batteries, and then we were going back out again and doing this a few times during the day.

The days were pretty long. We'd start normally around 6am to catch the sunrise and we finished around 9 to 10 pm.

We had a lot of time in Zodiac boats and that's where it got the coldest. It definitely got cold when the wind picked up on the deck, crossing some channels from one island to another. Sometimes we'd get hit by wind that was 60 or 70 kilometers an hour and minus 10 Celsius; then it starts to be a bit intense.

You mentioned gimbals?

I use gimbals, but not as much as people would think. I shoot handheld 99.9% of the time. Even in Antarctica, everything was handheld. There's no tripod. Because I do stills as well, I'm quite used to shooting that way; I'm quite stable. Unless I'm walking on uneven terrain, I'll go handheld rather than a gimbal.

I have an Easyrig. I got that when I was living in Sydney. I use it when I have to shoot a lot of stand-up interviews all day. So it is my best friend for setups like that.

Where do you get the Easyrig in Australia? From Lemac?

Yes, I got most of my kit from Lemac actually. They're great people and I've been working with them for many years. I try to go back to them as much as I can. Really great people.

Did the cold weather in Antarctic affect the camera?

The camera kept running nicely. I thought it would suffer somewhere, but it never did. Obviously, I didn't use the internal battery in extreme conditions. I had a PB-Edge battery for BMD Pocket 6K from CoreSWX that just sat underneath the camera body. It gave me about two and a half hours of shooting time. I used the internal battery in the ship when I was charging the bigger ones. Considering the weather and the cold, the camera did very well.

How do you do focus—manual or auto?

With the Pocket Cinema Camera 6K, for things that were far in distance I would push the auto focus button, just to give me a starting point. I would always have peaking on and I would adjust manually from there. On some lenses, like the 16-35, I was using the push button autofocus on the camera most of the time. And on the 70- 200, I was doing everything manually because it's goes so tight and the depth of field is shallow.

Did you use image stabilization on any of the lenses?

Always, on all lenses. That's the reason why I bought that kit and the lenses that I used the most were the 24-105 and the 70-200.

Those are the full frame EF lenses and the camera is Super35...

Florent Piovesan in the Antarctic

Yes. So when I was using 70-200, it was more like a 130-300.

What were your camera recording settings.

I actually shot everything in ProRes 422 LT UHD. Most was at 25 fps; the slow motion sequences were at 60 and 120 fps. I've shot Blackmagic RAW before, especially at high frame rates. But, because we were away for so long, after I did the math for having 4,000 to 5,000 clips in 4:2:2, I brought nine hard drives with me for a total of close to 10 terabytes of storage.

How did you wrangle the data?

I had three Wise Advanced 1TB CFast 2.0 memory cards. I've always used them with this camera. Every day was exceptional, but when we knew that one session or one landing was really great, I would download at lunch. I wouldn't look at the footage because there wasn't enough time. Then I would just keep shooting on the same card. I was stressing all day that the card wouldn't fill up. At the end of the day, I would always do a full download of the entire card and backup to another hard drive. I was mostly backing up from 9:00 PM-11:00 PM. I'd rotate with 3 cards.

Jon: Did you use a particular software for the backup?

No, I'm worked with my Macbook Pro. I dumped the files into the finder. And then from there to the hard drive. I had 9 small, super-fast Samsung SSDs. The main backups were normal hard drives. I named the folders by day and location. For example, day 1 would be landing at Neko Harbor and Paradise Harbor. I'm quite old school when it comes to notes. I had a notepad where I wrote comments. For example, "Day 2. We saw many whales today." It helps in the edits later on.

What did you do for sound?

I had the Røde NTG video mic—the new one that they had just released a couple of weeks before I went. That was my on-camera mic. It had a nice artificial fur wind shield. Onboard ship, I had a Sennheiser MKE 600. That's the mic I've been using for years now. It connects through the mini XLR input on the camera.

Blackmagic had not yet release the 6K Pro camera with EVF, so you were operating off the rear screen of the camera?

I spent a third of my time in Antarctica lying on the ground because penguins are small and people were kneeling a lot or sitting to take on the view. I used the screen at 100% brightness and it was surprisingly bright. Peaking was on high. I had the guidelines on because shooting the ice and the ocean, it was very obvious when I wasn't level.

We were never on flat terrain, not once. I couldn't put a camera down on the snow because it would get super cold and wet. I had to put the camera on my knee or I would put the camera on top of my bag.

I couldn't wear sunglasses although I had them with me to prevent snow blindness. I had a hood and a hat that allowed me to block the light out. I used the top handle to hold the camera.

Do you check the equipment in as baggage enroute to location?

Because I've been doing this for so long, it's funny, I don't look like a filmmaker when I'm traveling. I just have a hard shell suitcase. It's just a Samsonite 82cm. It is one the largest you can get but super light. I put all my equipment—Easyrig, tripod, lenses in F-Stop pouches and then my personal clothing to keep everything tight and padded.

A second, smaller hard shell suitcase had hiking boots, heavy metal things like the gimbal, a Litepanel, small LEDs, and a reflector. It was a total of 52 kilos roughly in one big suitcase, one small suitcase and my backpack.

Honestly, there wasn't much room left for clothing on this trip. I had merino t-shirts, merino long sleeves, Gore-Tex pants, one pair hiking pants. They expedition provided a heavy jacket. I had a Gore-Tex shell just in case. I had one nice buttoned shirt for dinners on board. No jeans, just hiking pants and shorts.I think I had about 2 ½ kg of clothing and about 50 kg of gear.

What are you working on now?

At the moment I am working on a few collaborations, pushing my YouTube channel, and hoping to get back into more documentary work when the borders and things open up. I'm always keen for new experiences and the trip to Antarctica was definitely something that I'll remember.

And, of course I got a new Blackmagic Pocket Cinema Camera 6K Pro. Its amazing new features would have been extremely handy in Antarctica.

oftwolands.com
Of Two Lands YouTube channel: *youtube.com/oftwolands*

Musashi-Opt 29-120 mm T2.9 Full Frame Zoom

Musashi Optical System Co. Ltd is based in Saitama, Japan, about 20 km north of Tokyo. Founded in 2003 by former Fujinon executives, Musashi-Opt (as it is commonly called) is well-known for its OptMag and OptMore PL mount extenders and Full Frame expanders.

In 2019, they introduced a Super35 23.9-195 mm T2.9 zoom lens. This was followed by the Takumi 1, a Full Frame 40.6 - 332 mm T4.8 PL-mount version of the lens.

Now, Musashi-Opt announces the all new Takumi 2 Full Frame 29-120 mm T2.9 PL-mount zoom lens.

Takumi means artisan. The lenses are designed and crafted by artisans in Musashi-Opt's own factory, in-house, in Saitama. A Takumi 2 arrived at FDTimes a couple of weeks ago.

The workmanship is superb and the performance is excellent. Zoom tracking stayed true; the optical center did not waver. The aperture remains constant; there is no exposure ramping. Focus is smooth and does not breathe.

The image is crisp and sharp with silky skin tones and pretty bokeh. The optional top handle is artisanal. Takumi.

- Focal Length: 29-120mm
- Zoom ratio: 4.1x
- Aperture Range: T2.9 - 22 (no exposure ramping)
- Iris: 9 Blades
- Maximum Coverage: 46.3 mm diagonal
- Mount: PL Mount
- M.O.D from Image Plane: 4 ft
- Focus, Iris, Zoom Gears: Standard 0.8 metric module
- Barrel Rotation: 160° zoom / 280° focus
- Front Diameter: 136 mm
- Length: 370 mm
- Weight: approx. 7.7 kg /16.9 lb
- Country of Manufacture: Japan
- Available   May - June 2021
- www.musashi-opt.co.jp

Tillmann Brothers' *The Old World - a Mindtrip through Europe*

Andi Tillmann with custom backpack rig, ALEXA Mini, Leitz Summicron-C, leading Martin Söderström in Stranda, Norway.

Tillmann Brothers is a family business based in Munich. Their backgrounds are in professional mountain bike free riding and filmmaking. There are three of them: Toni is the DP. He's the oldest. Andi is the producer and director. He's in the middle. Michi, the youngest, is the art director, editor and camera operator.

Their latest film, *The Old World - a Mindtrip through Europe* is an action adventure sports feature about the various disciplines of riding and the convergence of Mountain Biking and BMX. It was four

years in production, with 2 years of principal photography, 90 TB of footage, and more than 30,000 kilometers travelled.

The Old World explores the diversity of Europe's riding culture, figures in many landscapes. Among the many locations, Martin Söderström rides trails above beautiful fjords in Stranda, Norway. Bruno Hoffmann and Mo Nussbaumer take on Berlin for a different view of BMX riding. Matthias Dandois combines technical BMX riding with elegance and control in Paris. Downhill racer

L-R: The Brothers Tillmann: Toni, Andi and Michi.

Tillmann Brothers' *The Old World*

Martin Söderström airborne in Stranda, Norway. All photos © Julian Mittelstädt. *jmvotography.com*

Rachel Atherton rides in Machynlleth, Wales and Chris Akrigg takes on tough conditions in the Scottish Highlands. Nico Scholze, David Godziek and Diego Caverzasi dirt-jump in La Poma, Spain. Vincent Tupin rides the snowy slopes in Châtel, France.

These are the kind of conditions where you wonder how the camera crew could keep up with the riders. Equipment came from Tillmann Brothers' own inventory with support from Vitec Group and Red Bull Media House Rental Services in Salzburg,

Austria. The main camera was an ARRI ALEXA Mini shooting ProRes 4444 and ProRes 4444 XQ.

Toni said, "Combined with Summicron-C primes, the look was something special. We used them for dramatic sequences, on our DJI Ronin 2, MoVi Pro, attached to Andi's backpack rig, on skis, cranes and car mounts. Summicron-C primes are very high quality lenses that you don't always see in action sports cinematography. We like to go those extra steps and bring heavier, high-end

cameras and lenses onto the mountains. We are like an expedition type production team. We realize we have to bring all this high-end gear high up into the mountains and get up early the next morning to catch the first light.

"An ARRI Amira and Sony F55 were for B-camera and BTS. With the F55 and AXS-R7 recorder, we often shot 120 fps at 4K DCI. Combined with the lightweight Canon 50-1000 mm zoom on an OConnor 2560 head, this turned out to be our package for most slow motion sequences."

Their third camera was a RED GEMINI 5K to stay close to the athletes and action. Aerials were done with a DJI Inspire 2. A Vision Research Phantom Flex 4K provided slow motion at 1000 fps from a Cable Cam.

The Tillmanns needed scenes with a stabilized, remote-controlled ALEXA Mini shooting backwards from the camera operator on a bike toward the hero rider. After some testing, Holger Herfurth from Airtime Unlimited machined custom parts to mount a Freefly MoVI Pro gimbal to a backpack. The ALEXA Mini was configured as light as possible with an added Teradek 1000 video transmitter and a wireless focus system. Andi, an experienced pro mountain bike rider, was the operator with an extra 15 kg of gear on his back. His footage is amazing: racing through incredible landscapes at perilous speeds over gravity-defying pitches.

In addition to wearing many other hats, or helmets, Michi was also the DIT. Offloading data during the day was not an option. The crew carried memory cards for a full day of shooting. Michi assembled enough card readers so that he could queue most of a day's footage and let ShotPut Pro do the offload overnight. A Blackmagic eGPU provided extra processing power to review dailies. For backup, Michi copied everything twice to LTO tapes using an MLogic MTape Thunderbolt LTO drive.

Michi talks about the post process: "We decided on a 24p UHD HDR Dolby Vision release with Dolby Atmos sound for theatrical and online release. The editing suite is located in our office. We added a new 80 TB 12-bay Areca SAS expansion to our existing Areca 8050-T3 Thunderbolt 3 RAID. The editing computer is a custom built PC running Windows 10. Proxy edit files were part of our initial plan but that was quickly discarded as we needed to have full resolution RAW data accessible at all times to determine image quality, try out picture styles, effects and cropping."

Michi decided to edit and grade in DaVinci Resolve Studio for a seamless process from camera files to color and conform. He said, "We were planning on hundreds of effects like time-remapping, stabilization, blend-effects and scaling. If you lost only a fraction of those, or Resolve's interpretation of an effect wouldn't prove satisfactory, it would have meant delays rebuilding these in grading. Those are some of the reasons we decided to edit in Resolve early on. One of the greatest advantages of working with Resolve is the way it handles native camera files. The hardware acceleration made a lot of difference. Playback speed was real-time 90% of the time and it's a good feeling to know that, as soon as performance drops, you just pop in another graphics card and on you go.

"Because there was so much footage, cutting the whole show as one complete project would have been slow. Startup and saving times, as well as project performance, took a big hit after we reached about 50% of the edit. Startup took around 15 minutes and every auto save about 5 minutes. So we decided to split the project up into chapters. This solved most of our problems.

"Blackmagic Design was kind enough to support us with their DaVinci Resolve Editor Keyboard and that was a big help. The edit process was faster, smoother and more accurate with it. One thing that really stands out about DaVinci Resolve is how it com-

Tillmann Brothers' *The Old World*

bines media management, editing, sound, and color grading into one tool. (We did not use Fusion.)

"Media management started about halfway through the production. We screened and tagged all of the footage. This took about two months. Organization was important to be able to find a shot later on when searching by tags, metadata or description."

Grading and sound mixing was at Post Production Services of Red Bull Media House in Salzburg. Because they use DaVinci Resolve Studio in their color grading suites, that was another reason the Tillmann Brothers decided to finish in Resolve as well.

Toni added, "Resolve turned out to be the right move because after locking picture, all we had to do was consolidate the project's media—about 9 TB— and drive one hard drive to Salzburg. The online was as easy: transfer the footage, open the Resolve project, relink, and grade. Ours was the first project at Red Bull Media House to use Resolve all the way from edit to finish and our colorist loved it. Usually he would have planned about two to three extra days preparing a project from the XML files of another NLE, and comparing the timeline with a reference file, clip by clip.

"We went for an HDR Dolby Vision master. After an easy and successful online, colorist Phil Strahl, CSI [a.k.a. LUTwig van Gradehoven] and I went through the project to create the key style references for each riding segment and the side story. The grades were unique to the style of each location. Next, Phil did an ACES conversion and then spent about a week matching all the shots.

"For matching all the different cameras, the ACES process proved to be excellent. Even a couple of highly compressed GoPro and DJI Mavic shots made it in the movie and they matched surprisingly well. Of course, it is not 100% and I wouldn't recommend doing that on a feature film where you have to match skin tones, but out in the wild with lots of action, a slight mismatch is not as obvious."

The Old World - a Mindtrip through Europe is streaming now on Apple TV, iTunes, Amazon, Google Play, Vimeo on Demand and elsewhere: *tillmannbrothers.com/the-old-world#buy*

See the trailer at: *tillmannbrothers.com/the-old-world*
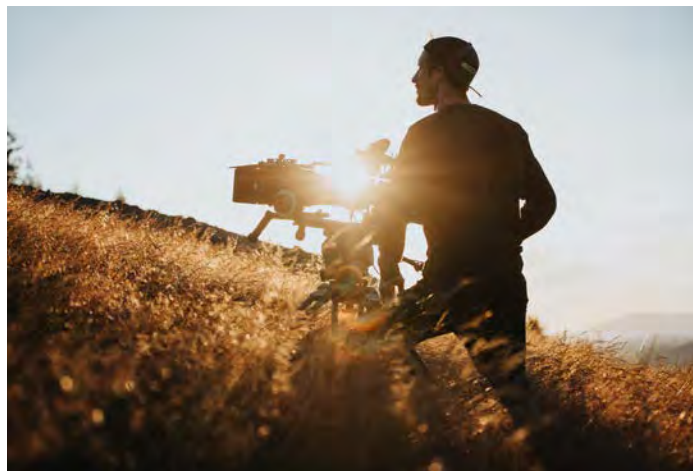
11 ZEISS Supreme Prime Radiance

And now there are 11.

Initially, 7 ZEISS Supreme Prime Radiance (SPR) lenses were introduced in June 2019.

Inevitably, cinematographers asked for more.

Now, just short of 2 years later, ZEISS has introduced 4 more Supreme Prime Radiance lenses: 18, 40, 65, 135 mm.

Imagine ZEISS planners and designers sifting through all the requests. Ultimately, they made careful choices. Go wider and longer: 18 mm and 135 mm. Add a 40 mm because that has been a favorite focal length of many DPs, including Gordon Willis, ASC. But wait, *Godfather* was Super35. Doesn't matter, SPRs are as beautiful in Super35 as in Full Frame. Quick math: what is the approximate equivalent of a 40 mm Super35 prime in Full Frame? Of course, 65 mm, another all-time favorite.

That was just my fantasy of how the ZEISS designers decided.

Christophe Casenave, ZEISS Product Manager for Cinema Lenses, explained what really happened: "40 mm and 65 mm are respectively Full Frame equivalents to 27 mm and 40 mm in Super35, which are two legendary focal lengths you will only find in use for cinema."

ZEISS Supreme Prime Radiance lenses artistically emphasize ghosting (flares). They are consistent across the entire set. They are based on Supreme Primes but have a warmer color tone. And no, they are not simply the same Supremes with coatings removed.

There is no loss of light and no uncontrolled "white-out." Instead, Radiance Primes have newly formulated T* Blue coatings. While there are 13 focal lengths in a set of Supremes, there are now 11 Radiance Primes, from 18 to 135 mm, all T1.5.

Please see an interview about the development of ZEISS Radiance Primes in FDTimes December 2019 Issue 98.

11 ZEISS Supreme Prime Radiance

Lens	Aperture	Close focus	Front Diameter	Length	Weight	Image Diagonal	Focus Barrel Rotation
18 mm	T1.5-T22	0.35 m / 14"	114 mm	163 mm / 6.4"	2.27 kg / 5.0 lb	46.3 mm	300°
21 mm	T1.5-T22	0.35 m / 14"	95 mm	119 mm / 4.7"	1.5 kg / 3.3 lb	46.3 mm	300°
25 mm	T1.5-T22	0.26 m / 10"	95 mm	119 mm / 4.7"	1.42 kg / 3.13 lb	46.3 mm	300°
29 mm	T1.5-T22	0.33 m / 13"	95 mm	121 mm / 4.8"	1.61 kg / 3.55 lb	46.3 mm	300°
35 mm	T1.5-T22	0.32 m / 13"	95 mm	119 mm / 4.7"	1.40 kg / 3.09 lb	46.3 mm	300°
40 mm	T1.5-T22	0.42 m / 17"	95 mm	121 mm / 4.8"	1.49 kg / 3.28 lb	46.3 mm	300°
50 mm	T1.5-T22	0.45 m / 18"	95 mm	119 mm / 4.7"	1.22 kg / 2.69 lb	46.3 mm	300°
65 mm	T1.5-T22	0.6 m / 2'	95 mm	121 mm / 4.8"	1.63 kg / 3.59 lb	46.3 mm	300°
85 mm	T1.5-T22	0.84 m / 2'9"	95 mm	119 mm / 4.7"	1.42 kg / 3.13 lb	46.3 mm	300°
100 mm	T1.5-T22	1.1 m / 3'9"	95 mm	119 mm / 4.7"	1.7 kg / 3.74 lb	46.3 mm	300°
135 mm	T1.5-T22	1.4 m / 4'6"	114 mm	146 mm / 5.7"	2.27 kg / 5.00 lb	46.3 mm	300°

New focal lengths are highlighted in yellow.

13 ZEISS Supreme Primes

ZEISS Supreme Primes were introduced in June 2018. In the beginning there were 5 focal lengths. Like clockwork, additional lenses arrived. Now there are 13.

ZEISS Supreme Primes have a user-interchangeable lens mount system like the Radiance Primes. The mount can be exchanged by the user, rental house, DP or the camera assistant: PL, LPL and PV. The lenses come with Cooke /i and ZEISS Xtended Data.

Christophe Casenave described the look of Supreme Primes: "It's a gentle sharpness. We insisted on a look that is versatile and flexible. It's not a vintage lens. It's not a specialized look. We do not dictate a look to the cinematographers.

"We make a lens to the best of our abilities so that all possibilities are available. It allows you to have sharpness where you need it, but has also has very smooth skin tones and textures.

"We worked hard on the Supreme Primes to achieve the sharpness of Master Primes, but on the other hand, to have a more smooth fall-off. We made the transitions between the areas in-focus and out-of-focus, between the sharp and the un-sharp parts, much smoother. The focus fall-off is much smoother, much gentler. When you consider that DPs confront actors' and actresses' faces 80 percent of the time, this helps a lot—eyelashes are sharp and the face is silky smooth."

13 ZEISS Supreme Primes

Lens	Aperture	Close focus	Front Diameter	Length	Weight	Image Diagonal	Focus Barrel Rotation
15 mm	T1.8 to T22	0.35 m / 14"	114 mm	149 mm / 5.9"	tbd	46.3 mm	300°
18 mm	T1.5 to T22	0.35 m / 14"	114 mm	163 mm | 6.4"	2.27 kg / 5.00 lb	46.3 mm	300°
21 mm	T1.5 to T22	0.35 m / 14"	95 mm	120 mm / 4.7"	1.61 kg / 3.54 lb	46.3 mm	300°
25 mm	T1.5 to T22	0.26 m / 10"	95 mm	119 mm / 4.7"	1.42 kg / 3.13 lb	46.3 mm	300°
29 mm	T1.5 to T22	0.33 m / 13"	95 mm	121 mm / 4.8"	1.61 kg / 3.55 lb	46.3 mm	300°
35 mm	T1.5 to T22	0.32 m / 13"	95 mm	119 mm / 4.7"	1.40 kg / 3.09 lb	46.3 mm	300°
50 mm	T1.5 to T22	0.45 m / 18"	95 mm	119 mm / 4.7"	1.22 kg / 2.69 lb	46.3 mm	300°
65 mm	T1.5 to T22	0.6 m / 2'	95 mm	121 mm / 4.8"	1.63 kg / 3.59 lb	46.3 mm	300°
85 mm	T1.5 to T22	0.84 m / 2'9"	95 mm	119 mm / 4.7"	1.42 kg / 3.13 lb	46.3 mm	300°
100 mm	T1.5 to T22	1.1 m / 3'9"	95 mm	119 mm / 4.7"	1.70 kg / 3.74 lb	46.3 mm	300°
135 mm	T1.5 to T22	1.35 m / 4'5"	114 mm	146 mm / 5.7"	2.27 kg / 5.00 lb	46.3 mm	300°
150 mm	T1.8 to T22	1.5 m / 4'11"	114 mm	146 mm / 5.7"	2.27 kg / 5.00 lb	46.3 mm	300°
200 mm	T2.1 to T22	2 m / 6'7"	114 mm	183 mm | 7.2'	2.87 kg / 6.33 lb	46.3 mm	300°

4 New ZEISS Supreme Prime Radiance

These are the 4 new ZEISS Supreme Prime Radiance lenses. PL and LPL mounts are user-interchangeable. As with the rest of the Radiance and Supreme sets, eXtended Data is provided in the lens mount or via a 4-pin connector. An extension of /i Technology, XD lens metadata includes ZEISS distortion and shading lens information.

Ben Smithard, BSC on *The Father*

Florian Zeller, Director, and Ben Smithard BSC on *The Father*.
Photo by Sean Gleason. Courtesy of Sony Pictures Classics.

Anthony Hopkins won Best Actor at the 2021 Oscars for his perfor-mance in The Father, *which also won Best Adapted Screenplay for director and writer Florian Zeller. Earlier, I spoke with cinematog-rapher Ben Smithard, BSC.*

Jon Fauer: How did your work on *The Father* begin?

Ben Smithard: I heard that Anthony Hopkins was going to be in the film. I had worked with him twice before—on *King Lear* and *The Dresser.* We got on very well. I was familiar with Florian Zeller, the French writer and director (who Mark Lawson of the Guardian calls the most exciting new theatre writer of our time).

I read the script and was very eager to do it. Mainly because Flo-rian thought his English wasn't going to be good enough for the necessarily very close collaboration between DP and director, he originally wanted a French DP. Nevertheless, I was able to get a meeting and explained, "Florian, I understand every word you're saying. I understand the script inside out. I get it. I very much want to do the movie." He agreed.

When did you start?

We started preparing around April 2019. Trying to find a stage in London was quite difficult because it was a very busy time. I've come across this before. You've got an amazing project with some

of the best actors in the world and you just can't get Pinewood or wherever because the stunt crew on the latest action film has taken up the stages for their stunt rehearsals. We were so far down the pecking order it was unbelievable. Even on *My Week With Marilyn*, with a great cast that included Judy Dench, Eddie Redmayne and Michelle Williams, we couldn't even get a stage appointment. I guess that's the story of my life, ending up getting shoved into a tiny little stage. By now, I'm used to that. And all I really care about is the project and the director and the actors.

Do you mind talking about technical things? Can we begin at the front of the camera, with the lenses?

Shooting started in May 2019. The lenses were ZEISS Supremes. The ZEISS Radiance Primes weren't out yet. The first time I shot with ZEISS Supremes was on the *Downton Abbey* feature at the end of 2018 with a Sony VENICE. By the way, I had shot with Cooke lenses for years and years, and they're also great lenses. But all the qualities of ZEISS lenses are perfect for me, everything they've ever done: Super Speeds, Ultra Primes, Master Primes and now Supremes.

To be honest, I've got ZEISS lenses for my stills cameras. I know where I am with ZEISS lenses. Now, some of the older sets of lenses that people are very obsessed with are great, I must admit.

But when I shoot a film—a feature or drama— I want a big range. I need the complete range of focal lengths from 14 mm to 135 mm. I know you don't get that with Super Speeds. I think the Ultra Primes were probably the best set of lenses I used before Supremes. I like their range. The build quality is amazing. They're small and there are no real surprises with them. But *The Father* required Full Frame lenses, and so, the Supremes.

You didn't use zooms on this job, did you?

Yes, I did. I used the Full Frame ZEISS Cinema Zooms on a few shots. I didn't use them much but there are shots where I wanted to be able to push in very slowly to manipulate the shot, move into a character. You won't even notice I'm doing it. You can hide the zoom move. And before you know it, you're there when you've got an intense scene and want to build the pressure up and just want to control it.

I have used ZEISS Cinema Zooms (15-30, 28-80, 70-200 mm — all T2.9, Full Frame) before, as well. They're actually very good. Also, they are helpful for handheld because they're quite light and very solid, as you'd expect. I wish ZEISS did a 10:1 zoom to have the whole range. The Angénieux 24-290 and before that the 25-250 HR have been go-to zooms on pretty much every job I did in Super35.

Did you use most of the focal lengths of the Supreme set?

I used the ones that I could get hold of. (*The Father* started shooting in April 2019. At that time, the Supremes were relatively new and only the 25, 29, 35, 50 and 85 mm lenses were available.) There is a story to this, actually. I didn't initially intend on shooting with the ZEISS Supremes. I was going to shoot the film on an old set of Medium Format Mamiyas that I own, modified, but not rehoused, by Duclos. But you can't really bash them around. They wouldn't last as well as a proper set of rehoused lenses. But I was trying to save pennies for production.

So, I was testing them a few days before we were to start the shoot.

I went through all my lighting setups for different times of day: 11 o'clock in the morning, 3 in the afternoon, 5 pm for early evening, or 7 pm at night. I had all these presets in the dimmer packs. I could easily flip between the different times of day. So I put the camera in there with the Mamiyas on, and obviously I had tested these Mamiyas before and they were amazing. I'm not a lens geek, but these are really good lenses. But I soon realized that I was struggling, because on those Mamiyas the T stops are all over the place. Quite a few of them are T2.8, but some are T3.5 and others are nearly T4.

Still photographers never worried about that. They never required every lens to be T1.5, as the Supremes are. Proper Medium Format is bigger than Full Frame by quite a bit. So the depth of field is very shallow at wide apertures and that is why the slower apertures are common.

Anyway, after I'd lit the sets, and I put the Mamiya lenses on, I realized, "You know what? I don't think I've got enough light for this film with these lenses." I could have pushed the VENICE to 2500 ISO, as I had tested on *Downton Abbey*. I know it's possible, but I didn't want to shoot a film at 2500 ISO. So I got on the phone to Graham Hawkins at 24-7 Drama. I asked, "Graham, have you got any ZEISS Supremes? I'm going to need them for this film." And that was it. I knew the Supremes and how they worked. I was very happy to be using the Supremes again. They are very versatile. And cut to a week later, I was doing night scenes wide open at T1.5 with Supremes.

How would you describe the look of ZEISS Supremes?

The best answer, Jon, is the article that was in your magazine when the Supremes came out, which is possibly the longest article about new lenses I've ever read in my life, around 40 pages. I was thinking, is this ever going to end? [chuckle.]

Sorry, I'll make it shorter next time. [grin.]

No, no, no. It was great. It was like they really did their work on those lenses. I'd love to get to the ZEISS factory one day.

Ben Smithard, BSC on *The Father*

Olivia Colman, Florian Zeller, Ben Smithard BSC.
Photo by Sean Gleason. Courtesy of Sony Pictures.

I hope you do. It's impressive. What were your personal impressions of the Supremes?

When I first used Supremes with the Sony VENICE on *Downton Abbey,* I was worried that they could be a bit too sharp and a bit too clinical. But when I was grading, they were "on the tin" as we say. The Supremes are quite neutral and they sit with all the others ZEISS lenses, which is fine by me. You can shoot with them wide open, same as you can shoot Master Primes wide open. I learned this from shooting film with ZEISS lenses week in and week out doing commercials and TV. When you set your lens to T2, it truly is T2. Master Primes came out towards the end of my shooting a lot of 35mm film, which is a real shame because that combination was spectacular.

Do you prefer Master Primes to Ultra Primes?

Not really. Master Primes worked really well on film. A lot of the time on film, on a lot of jobs, we were trying to find the sharpest lenses because lots of weird stuff happened in the lab with film, as it was naturally soft and forgiving anyway. So you wanted sharp lenses. When the ZEISS Ultra Primes came out, I didn't want to shoot with anything else apart from Primos, which were also good for film. So I stuck with Ultra Primes for years and years. But they are Super35; the Supremes are Full Frame and also very good. I did a commercial recently for Starbucks with Supremes. We finally used the 18 mm, which is a little bit bigger than the others, but is an amazing lens.

Which leads to my question about Full Frame versus Super35. *The Father* was a studio job in tight quarters. Was that the reason you went to Full Frame?

I wanted to shoot on the VENICE for lots of reasons. I like the camera. I could have shot 4K Super35 on the VENICE, I suppose, but I'd never done that.

Was it a matter of depth of field or that you preferred Full Frame format?

If it's going to make the film a little bit better, then I'm all for it.

Please tell us about using Sony VENICE.

I've always liked the high-end Sony cameras ever since the Genesis. Then I enjoyed the F65 on two or three features. And when VENICE came out, I just thought they were very clever. Internal ND filters are a big thing with me because I like to change them around really quickly. The fact that they did them in increments of 0.3ND was a great idea. It saves a lot of time while shooting and it can also saves you time on the grade as well. The reason is that sometimes not all of your neutral density filters in the mattebox will match. I happen to own my own neutral density filters and they don't always last long. You can't keep those filters for 15 years and expect them to be perfect. Whereas with a well-maintained camera or good rental company, internal NDs should

Ben Smithard, BSC on *The Father*

Anthony Hopkins, Florian Zeller, Olivia Colman, camera and crew.
Photo by Sean Gleason. Courtesy of Sony Pictures.

never change. They don't get sunlight or dust on them. I like the fact that they're quite small.

There's nothing really wrong with the Sony VENICE. I like the color science of it. It's a really good, well-thought-out camera. It is simple to use and it has been reliable. Last year some directors asked me why I wanted to use the Sony VENICE, usually on commercials. There are lots of reasons. Look at it from their perspective: you don't necessarily want to say to a director, "Oh, well, I use it because it's really reliable." Most high-end digital cameras are reliable and are striving for the same thing. Ultimately, it doesn't really matter which camera you shoot on. The really high-end cameras are all designed by very clever people who have all learned from experience. I could shoot on any of them and make them all look however I needed them to look. But I do like the Sony VENICE.

I must admit, the last commercial I shot involved all close-up details and really complicated setups. I shot the whole thing on VENICE with the Rialto tether. That was amazing. You can remove the camera head from the body so it's really small. We had the ZEISS Supremes on that commercial as well. You can put the body in a backpack and go wherever you want.

On *The Father,* what ISO did you rate the camera, especially for the night interiors?

It was all 500 ISO and I didn't change it. I lit to that and gave myself a bit of breathing room. I never needed the 2,500 ISO, which I did a few times on *Downton*.

So you added internal NDs when you went to daylight, or day interior?

Yes. And because the day interiors were naturally brighter anyway, I would also stop down on the lens. I don't go into a film saying that I'm going to shoot the whole show at T2.8, for example.

And did you use any diffusion on the front of the lens?

Yes. I used pretty light grades Schneider Classic Softs and also a set of Tiffen Glimmerglass.

Earlier, you mentioned that the studio was very small.

We shot in a studio in West London. I hadn't been there for maybe 20 years. We struggled a bit hanging large Rosco SoftDrop backgrounds that were required in the small studio space. Incidentally, this was the first time I'd used the SoftDrop. Sarah Horton, an English lady who manages the Rosco backdrop business, was very helpful.

At one hundred feet long, it was a big backdrop. The stage wasn't high enough and it was difficult rigging the lights all the way out to the edges for both daytime and nighttime. The stage was so small that, for example, the front door of the apartment set

Ben Smithard, BSC on *The Father*

opened right up against the studio wall. Normally this is not allowed because a fire lane is required. We could only open the door if a fireman was there for safety. None of this surprises me, really; I'm used to it.

With two of the greatest actors around at the moment and also an amazing supporting cast, I suppose in some ways it was good to be in a small space shooting this film for quite a few weeks. Despite the fact that we were all on top of each other, everybody got along anyway. It created an interesting atmosphere. So that was good.

Could you have shot inside an actual location?

I don't think you could have shot it in a location, really. Certainly, with the exteriors outside the windows, you couldn't because the concept is that the background transforms as you go along. It would have been really crazy to shoot that in a location.

How did you light the small stage for all these different times of day and moods?

As with a normal stage set for me, it was back to a big dimmer board. I had a great desk operator named Candy. She was fantastic. I have worked with her before. Everything was tungsten. I had a few LEDs, not many. I'm very particular about tungsten light. There's one scene where I introduced a rectangular LED because it's very thin, very narrow, and I could get it up against the wall. But as soon as I introduced it, I could tell the color temperature was slightly off. I did not need a color temperature meter. I could tell it was pink. But I used it knowing I could correct it in the grade. But it was still not perfect.

Old school incandescent tungsten lights just don't go wrong. When you dim them down, obviously they get warmer. But you can tell where the light is just by looking at it—40% for example. That comes from years and years of being on the stage with 10Ks, 5Ks, 2Ks, 1Ks, and Rifa Lights. Every now and again on that set I used the odd Kino Flo because they work well for those spaces. It's not because I'm not adventurous, because I am. But, when I

set one light or twenty lights for a scene, I don't want anything to go wrong. I don't want a bulb to go out. I don't want it to flicker.

I love doing films with great stories and great performances. When you have people like Olivia Colman and Tony Hopkins or anyone, actually, I don't want them disturbed at all, especially in that kind of setting where it's all about concentration for the actor. To have control of the lighting and to create any look you want, I prefer to do it with lamps that I find reliable, that I know inside out. I'm not going to change that. I've tried to change it. It just doesn't work.

Because you were in a small stage and the ceilings were quite low, how were you able to hang anything from above?

We were able to hang lights. But the stage, which has a pitched roof, because it was formerly a warehouse, proved difficult when trying to light through the windows of the set. Depending on where you stood inside the set, if you got too close and looked up, you'd run out of SoftDrop background.

There was limited height and distance. Ideally, the lamp outside the window wants to be more than 14 feet away, but the backdrop was only 13 feet away. So the light wasn't far enough away, but we made it work.

How did you light the SoftDrop with so little space?

It was a cost thing as well. I used dimmable Cyc lights. They were placed in front and behind. I had a tiny bit of distance behind to light through the back. It was a Day/Night Backdrop. I lit from the front with these inexpensive units from Panalux and luckily they had loads and loads of them. Hardly anybody uses them anymore because they're out of date. They work, and they're very bright.

Lighting through the back for nighttime is generally where I find translights most effective. The daylight one is always trickiest because it's a bit like going to the theater where you suspend your disbelief. If you stand there in the set, and look at it, you'll see it's fake. But you have to believe that when you shoot it and it's edited,

Ben Smithard, BSC on *The Father*

and when you've done a bit of work on the grade, you can fix it.

Rosco can make the SoftDrop in varying levels of softness—more out of focus. I did it a little bit. If I had to do it again, I would go softer. It doesn't need to be; it would just help a bit more.

Was it a preexisting backdrop or did you create a custom one?

It was designed by the art director and me. It's a composite of a street in London. The actual street was photographed. The photographs were repeated and composited together by Rosco. They sent us the proofs. They have a big printing machine. It's a hundred feet long.

Please tell us about looks, data, files and grading.

The look for *The Father* was quite subtle. We had created it with my regular colorist, Gareth Spencely at Molinare, and my regular DIT Alan Hopkins. We shot in X-OCN (eXtended tonal range Original Camera Negative, Sony's version of RAW). As for grading, because Florian lives in Paris, he had to come back to London a few times. We did it in bits. I really appreciated that Florian let me grade in London. That was very helpful and made a big difference to me. I mean, absolutely we could have done it in Paris, but we didn't in the end.

It sounds like you are very busy in the UK right now?

You've got me in the middle of a run of commercials and on to the next feature with VENICE and Supremes again.

Rosco SoftDrop for *The Father*

Above: Rosco SoftDrop on *The Father*, as lit by Ben Smithard BSC for day and night. Below: actual location for backdrop. Photos courtesy of Rosco.

Rosco SoftDrops are seamless, woven cotton fabrics printed from a high-resolution photograph. They come in frontlight, backlight and day/night versions that can be as large as 40' high x 170' wide. The surface is ultra-matte which eliminates hot spots and reflections. Because the fabric can be folded, SoftDrops are shipped in standard containers—not extra-long tubes that traditional translights require.

Sarah Horton is a former art director and now Rosco's Senior Backdrops Specialist for EMEA. She shot the photos for the Soft-Drop on *The Father*. Sarah describes the process: "It was quite a long set that had a long run of windows overlooking a street. For the backdrop, I shot multiple camera positions on a crane down the length of a street that had been chosen in London. It wouldn't have been enough to just shoot from one position. We had to stitch together several camera positions and create a long run of it.

"The sky was replaced. We usually replace skies in our Rosco Soft-Drops to the wishes of the DP. Generally we go for something fairly neutral so that they can light it warm or cool, depending on what's needed. But some DPs like to see clouds. Obviously if you're shooting Miami, then it's probably going to be a blue sky. Whereas mostly all my jobs are in Europe where we are much more into a kind of neutral gray.

"As you see in the night image, it's always nice to do a kind of vignetting effect above the skyline, particularly in a city because you have this effect of the city glow coming up. The day image is lit from the front. The night image is lit from the back. For the night image, Rosco applies 95% black pigment to mask out many areas, such as buildings, so the windows glow with light. It's all touched up in Photoshop.

"We shoot both day and night. For *The Father*, I was on a scissor lift. Astrid Sieben, the art director, was with me with a can of chalk spray paint. Every time the lift moved for another camera position, she marked the position of the wheels on the road with chalk spray paint. A plum line marked the height. We had a very good driver of the lift so that we could find those positions again at night time.

"The backdrop is printed in Berlin, where I am, at Rosco's global backdrop production facility. The printing machine has a large barrel and a trolley that goes up and down with the ink on it. It's a long process. It took around 20 hours to print the night side of *The Father* SoftDrop, and then it's manually taken off and rethreaded to print the day side."

A section of the actual street that was photographed for the SoftDrop.

Sarah Horton shooting background plates for *The Father.*

Ed Lachman, ASC and his EL Zone System

See three views of Ed Lachman, ASC. Above, below, opposite.

See Ed in Rec.709 above. Go Ed, go.

See Ed in Panasonic VariCam V-Log, below. 18% gray card, 18%.

See Ed's EL Zone System map the scene's exposure, opposite page.

15 Stops in 15 colors. Bravo, Ed. Bravo.

EL Zone is as fun and easy to use as your first reading book with Dick and Jane, and of course Spot. Run, Spot, run.

Ed Lachman, ASC has come up with an incredibly intuitive, innovative and essential exposure tool. It's called EL Zone, which stands for Exposure Log Zone — or Ed Lachman Zone.

Think of it as a spotmeter in your viewfinder or monitor. Toggle it on or off. Each stop of exposure is represented by a color. White shows areas of the scene that are over-exposed by 6 or more stops. 18% gray is normal-neutral. Black is under-exposed by 6

Ed Lachman EL Zone System

Over Exposed			Light Skin Tone Range				18% Gray	Dark Skin Tone Range					Under Exposed
+6	+5	+4	+3	+2	+1	+½	0	-1/2	-1	-2	-3	-4	-5	-6
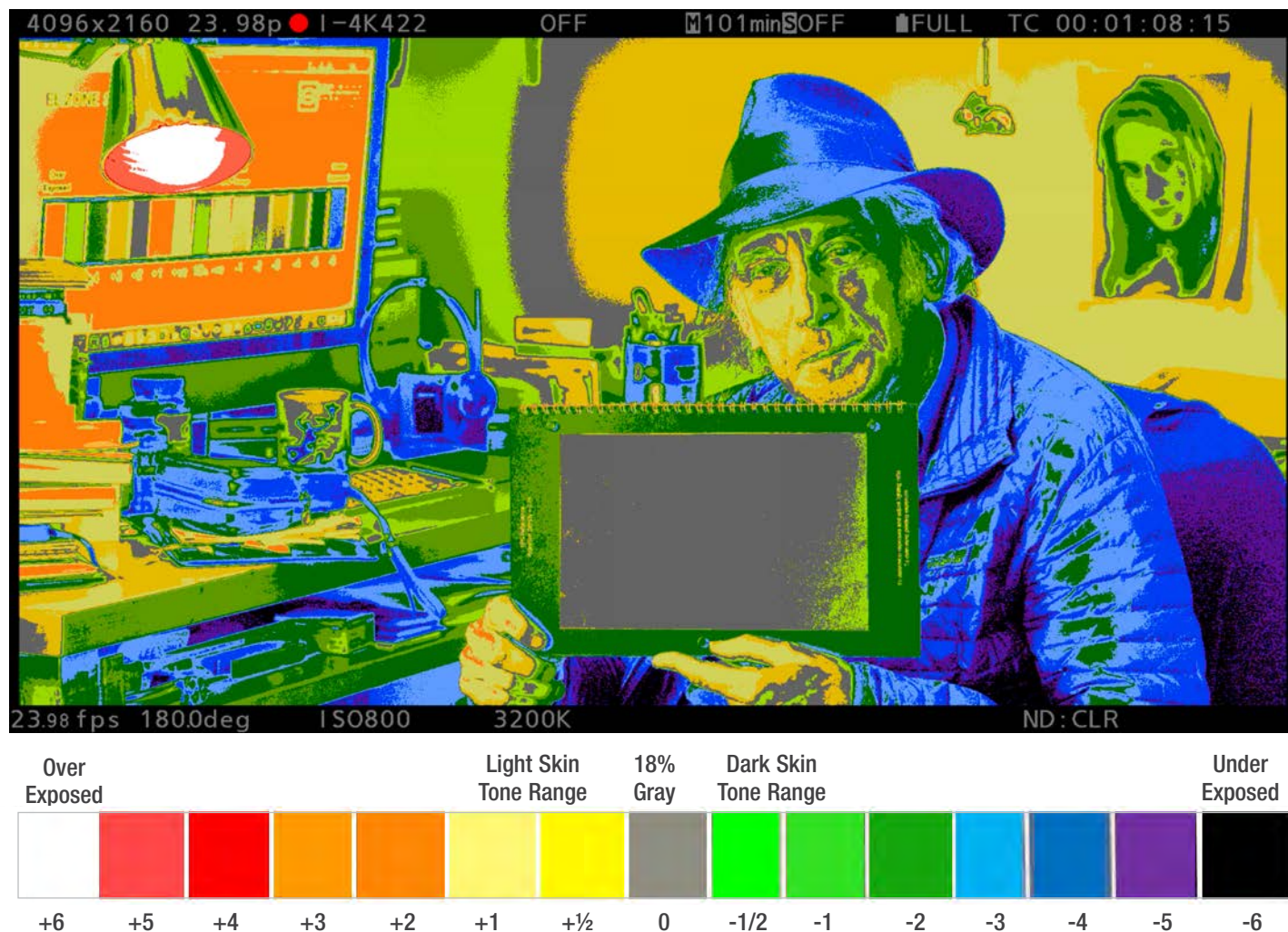
or more stops. You can correlate the rest of the stops and their corresponding colors by remembering the acronym in a rainbow: ROY G BIV. (Red, orange, yellow, green, blue, indigo and violet). Or, print out the strip above and tape it to your monitor or EVF.

EL Zone is now available on Panasonic VariCam LT and 35 via firmware updates. On the VariCam LT below, User Button 1 was assigned to toggle between clean view and EL Zone overlay. You can assign EL Zone to the EVF and a monitor via the camera's SDI-2 output (VF-SDI). EL Zone is supported in V-LOG, V-709, V-Look1 and V-Look2.

EL Zone On/Off

Ed explains, "I found false color and waveform monitors much too general. They are based on IRE values, which track percentages in voltage, aren't consistent with Stop Values on lenses or light meters, and are not the same from one manufacturer to another.

"So, I devised a system based on 18% gray, a universal standard for photography. Your camera can be your lightmeter. Or use an external lightmeter. They will be consistent with each other. You can also use an EL Zone framegrab of a scene to precisely match exposure and lighting at a later date for pickup shots or dreaded reshoots."

For example, let's say you come back 2 months later because the director wants an additional wide shot. The medium shot here was lit by Tinx Chan with a single-source open-face 2K through an 8x8 unbleached muslin. With EL Zone, when you return, you can be sure to match Ed's monitor to be +3 stops over; Ed's face to be +1 and +½ stop over toward the light and -2 on the shadow side.

Barry Russo worked with Ed to bring EL Zone to Panasonic Vari-Cam cameras. Additional team members who made this possible include Takahiro Mitsui in Panasonic Planning and Ryohei Yamato in Panasonic Engineering.

All manufacturers should embrace this astonishingly good in-camera spotmeter exposure system. EL Zone System is registered by Ed Lachman and his company Cinecam, Inc. © 2021.

A Room with a View and EL Zone System

Over exposed. The sky is +4. Only a few windows are 18% gray. From FDTimes office with VariCam LT feeding an AJA U-Tap SDI to Quicktime screengrab.
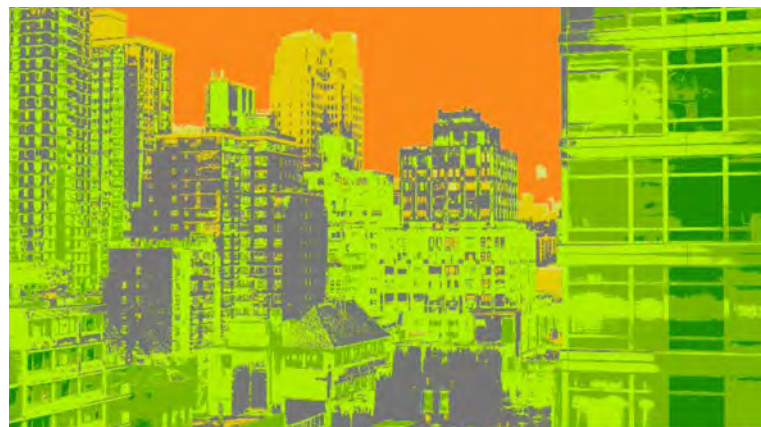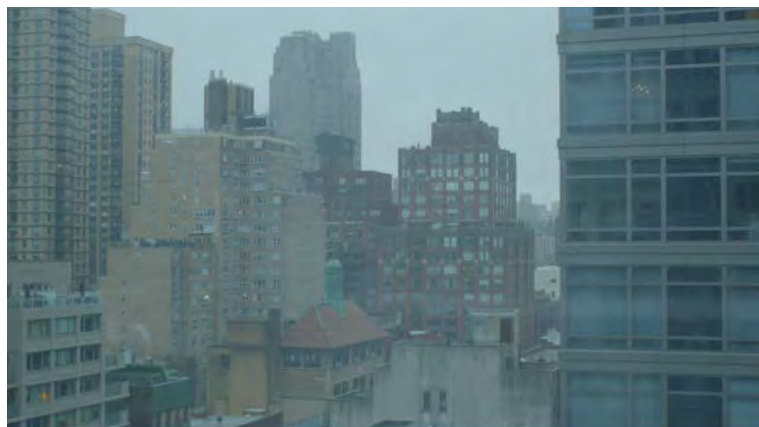
Normal exposure. The sky is +2. Buildings are 18% gray or darker.
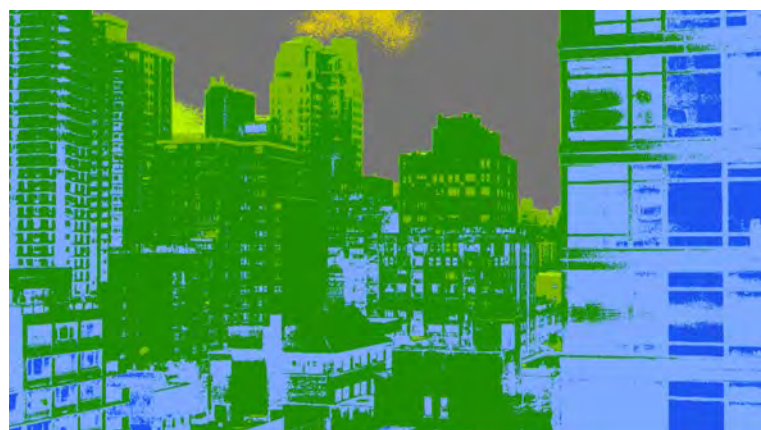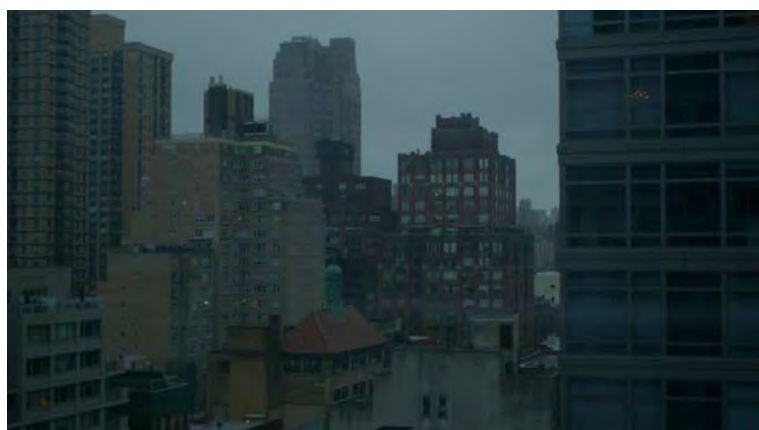
Under exposed. The sky is 18% gray. Everything else is darker. Day for dusk.

Over Exposed						Light Skin Tone Range		18% Gray	Dark Skin Tone Range					Under Exposed
+6	+5	+4	+3	+2	+1	+½	0	-1/2	-1	-2	-3	-4	-5	-6
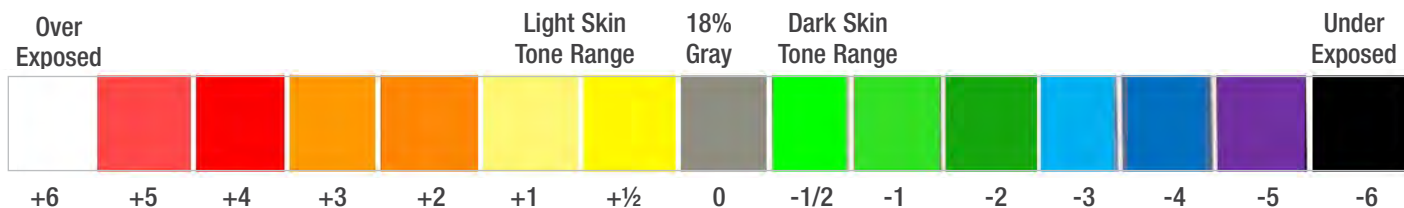
EL Zone and El Zone System are trademarks of Ed Lachman's Cinecam, Inc. © 2021 Cinecam, Inc. All Rights Reserved.

ALEXA Mini LF Update 7.0 includes Super35

4.5K LF 3:2 Open Gate - 4.5K 4448 x 3096 photosites
36.70 x 25.54 mm, Ø 44.71 mm

4.3K LF 16:9 - UHD / HD 4320 x 2430 photosites
35.64 x 20.05 mm, Ø 40.89 mm

3.4K S35 3:2 - 3.4K 3424 x 2202 photosites
28.25 x 18.17 mm, Ø 33.59 mm

3.2K S35 16:9 - 3.2K 3200 x 1800 photosites
26.40 x 14.85 mm, Ø 30.29 mm

2.8K S35 16:9 - HD 2880 x 1620 photosites
23.76 x 13.36 mm, Ø 27.26 mm

2.8K S35 4:3 - 2.8K 2880 x 2160 photosites
23.76 x 17.82 mm, Ø 29.70 mm
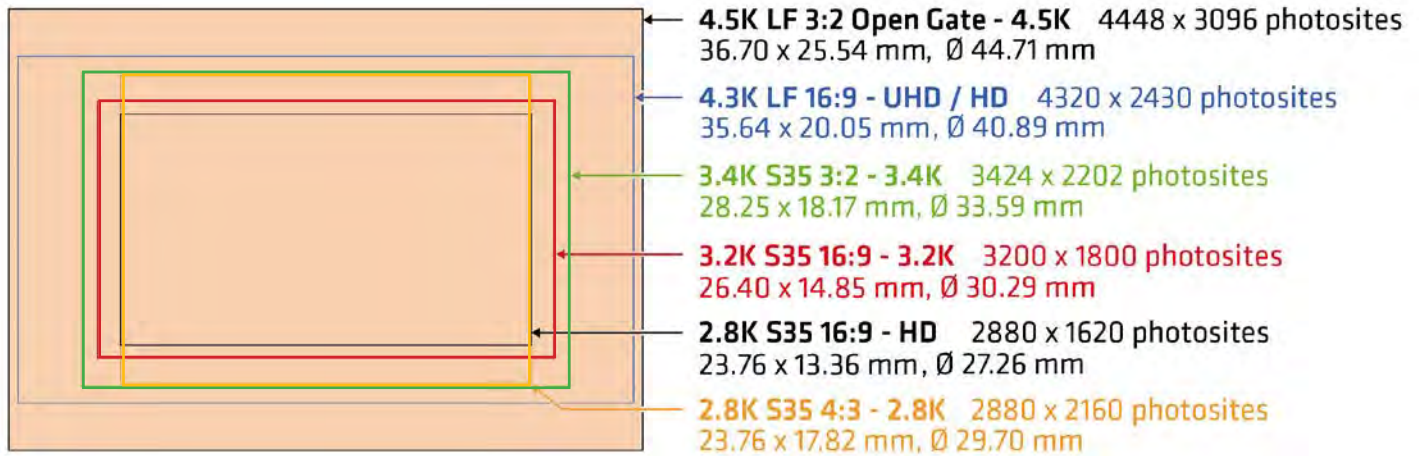
No sooner had ARRI ALEXA Mini LF arrived than users clamored for Super35 recording formats. And now, ALEXA Mini LF SUP 7.0 provides Super35. And lots more.

Until now, if you had traded in your beloved ALEXA Mini for a new Mini LF and then landed a Super35 job, of course you could have set Super35 framelines. You could put Mini LF into 16:9 sensor mode (31.68 x 17.82 mm, 3860 x 2160) and crop in post.

(In DaVinci Resolve, go to the COLOR Page. Click on the sizing tab. Adjust with the Zoom slider. Automate with a node.)

The new Software Update Package provides your ALEXA Mini LF with identical recording formats as an ALEXA Mini. As an added bonus, maximum frame rates are faster in S35 and recording data rates are lower for the two new LF formats.

But please note that Super35 formats on ALEXA Mini or Mini LF are still not approved for Netflix 4K. If it's a Netflix nod for 4K one wants, LF Large Format will fulfill.

New Super35 formats on ALEXA Mini LF are:

- 3.4K S35 3:2   3.4K   3424 x 2202   60 fps max.
- 3.2K S35 16:9   3.2K   3200 x 1800   75 fps max.
- 2.8K S35 4:3   2.8K   2880 x 2160   75 fps max.
- 2.8K S35 16:9   HD   2880 x 1620   100 fps max.

ALEXA Mini LF SUP 7.0 Beta Additional Features

► New LF Recording Formats:
  - MXF/Apple ProRes 4.3K LF 16:9 - UHD
    4320 x 2430 downsampled to 3840 x 2160.
  - MXF/Apple ProRes 4.3K LF 16:9 - HD
    4320 x 2430 downsampled to 1920 x 1080.

► Expanded Recording Format Names are more descriptive and include Recording Codec, Horizontal Photosites, LF or S35, Aspect Ratio and Recording Resolution. So, for example:
  - ARRIRAW 3.4K S35 3:2 - 3.4K
  - Apple ProRes 3.8K LF 16:9 - 2K

► Magnification (for focus) is now indicated by icons in the monitor status area on the left side instead of distracting orange lines around the image.

► Framelines, Aspect Ratios, Anamorphic Desqueeze:
  - Up to 256 framelines in the menu (previously 100).
  - LF and S35 Open Gate default aspect ratios:
    1.33:1, 1,78:1, 1.85:1, 2.00:1, 2.39:1
  - Desqueeze ratios: 1.25x, 1.3x, 1.5x, 1.65x, 1.8x and 2x

► Support for the Signature Zoom Extender 1.7x

► See ARRI's SUP 7.0 for complete details. Artwork courtesy of ARRI. www.arri.com/alexaminilf

ALEXA Mini LF, Mini, and LF Comparison Chart

Codec	ALEXA Mini LF — Mini LF SUP 7.0										ALEXA Mini — Mini SUP 6.1						ALEXA LF — LF SUP 4.3					
	Recording Format	Max. fps (1)	Compact Drive 1 TB (h:m) @ 24 fps (2)	Sensor Photosites		Recorded Image Pixels		Sensor Active Image Area mm		Recording Format	Max. fps	Sensor Photosites		Recorded Image Pixels		Recording Format	Max. fps (3)	Sensor Photosites		Recorded Image Pixels	
				h	v	h	v	h	v			h	v	h	v			h	v	h	v
ARRIRAW (4)	4.5K LF 3:2 Open Gate - 4.5K	40	0:32	4448	3096	4448	3096	36.70	25.54							LF Open Gate 4.5K	90	4448	3096	4448	3096
	3.8K LF 16:9 - UHD	60	0:54	3840	2160	3840	2160	31.68	17.82							LF 16:9 UHD	90	3840	2160	3840	2160
	4.5K LF 2.39:1 - 4.5K	60	0:54	4448	1856	4448	1856	36.70	15.31	Open Gate 3.4K	30	3424	2202	3424	2202	LF 2.39:1 4.5K	150	4448	1856	4448	1856
	3.4K S35 3:2 - 3.4K	60	0:59	3424	2202	3424	2202	28.25	18.17												
Apple ProRes (5)	4.5K LF 3:2 Open Gate - 4.5K	40	1:13	4448	3096	4448	3096	36.70	25.54							LF Open Gate 4.5K	60	4448	3096	4448	3096
	4.3K LF 16:9 - UHD	48	2:01	4320	2430	3840	2160	35.64	20.05												
	4.3K LF 16:9 - HD	75	7:57	4320	2430	1920	1080	35.64	20.05							LF 16:9 UHD	60	3840	2160	3840	2160
	3.8K LF 16:9 - UHD	60	2:01	3840	2160	3840	2160	31.68	17.82							LF 16:9 2K	60	3840	2160	2048	1152
	3.8K LF 16:9 - 2K	90	7:00	3840	2160	2048	1152	31.68	17.82							LF 16:9 HD	60	3840	2160	1920	1080
	3.8K LF 16:9 - HD	90	7:57	3840	2160	1920	1080	31.68	17.82							LF 2.39:1 4.5K	100	4448	1856	4448	1856
	4.5K LF 2.39:1 - 4.5K	60	2:01	4448	1856	4448	1856	36.70	15.31	16:9 3.2K	60	3200	1800	3200	1800						
	3.2K S35 16:9 - 3.2K	75	2:35	3200	1800	3200	1800	26.40	14.85	4:3 2.8K	50	2880	2160	2880	2160						
	2.8K S35 4:3 - 2.8K	75	2:24	2880	2160	2880	2160	23.76	17.82	16:9 HD	200	2880	1620	1920	1080						
	2.8K S35 16:9 - HD	100	7:57	2880	1620	1920	1080	23.76	13.37												

(1) = All Apple ProRes flavors have the same maximum frame rate on ALEXA Mini LF
(2) = Record Duration for Apple ProRes stated for Apple ProRes 4444
(3) = This holds for all Apple ProRes flavors except LF Open Gate ProRes 4444 XQ (40 fps) and LF 2.39:1 ProRes 4444 XQ (60 fps)
(4) = The file format for ARRIRAW is: .mxf for ALEXA Mini LF and ALEXA Mini, .ari for ALEXA LF
(5) = The file format for Apple ProRes is: .mxf for ALEXA Mini LF, .mov for ALEXA LF and ALEXA Mini
purple characters = same in ALEXA Mini LF and ALEXA LF
blue characters = same in ALEXA Mini LF and ALEXA Mini
yellow background = new format in Mini LF SUP 7.0

Litepanels Gemini 1x1 Hard

Above: BTS Production stills from Gemini 1x1 Hard launch video: vimeo.com/533514644/331c3e5d1f

Hard Soft. The new Litepanels Gemini Hard 1x1 is both hard and soft at the same time. This is not a paradox. It may remind you of a 5K Tungsten Fresnel, full spot through a 4x4 frame of 216 Diffusion. The light has intensity, punch, direction. And yet there is peripheral softness and fill. Highlights glow, lustrous and radiant. Light caresses surfaces and shadows fill gently. It is a very pleasing for portraits. Directional enough to punch through a studio fogger yet soft enough to avoid seraphic shafts. Bright and soft to light a studio sky of overhead rags or in separate Space Light style, skirted, diffused or raw.

The Gemini Hard 1x1 is so bright, you may want sunglasses. I measured 3660 lux / 340 footcandles at 10 feet and set to 5600K CCT. That's T11½ at 800 ISO, 24 fps (¹⁄₄₈ sec). This was even more than official Litepanels specs of 3023 lux.

This is at least 4 times brighter than its sibling, Gemini 1x1 Soft. As a New York gaffer might say, "It's a scorcher." But it's LED, cool to the touch, infinitely tunable, dimmable, and controllable. It's a 1 foot x 1 foot LED panel that you'd expect to be soft but has punch and direction. Add the Ultra Light diffusion panel, and the lighting looks magical.

Pat Grosswendt, Litepanels Co-Founder and gaffer (we worked together on commercials) explained the Gemini Hard in its NDA development days, "It has a 'spun glass' look as if on an old Titan arc. Quality punch that looks flattering on the subject. Hard strong, but sublime."

The Gemini Hard 1x1 with Ultra Light Diffuser has an ineffable beauty that is almost a riddle until you try it. "Hard-Soft, Directional-Diffusion, Headstrong-Gentle. As Philip Henslowe (played by Geoffrey Rush) says repeatedly in *Shakespeare in Love*, "It's a mystery." I would add, "It's a beautiful mystery."

Litepanels Gemini 1x1 Hard Specs

- LED Panel: RGBWW
- Beam angle (no diffuser):   46°
- Beam angle w/ Dome: >100°
- CCT Range: 2,700-10,000 K
- TLCI / CRI (average):   98
- Menu Control Modes: RGBWW / CCT / HSI / Gel / FX (Effects)
- Digital Gels: 300
- Effects: 11
- Dimming: 0-100% Continuous
- Remote Control Options: DMX, RDM, WDMX*, Bluetooth* Apollo CRMX*   (* with optional dongle)
- Presets: 6 CCT preset buttons with A/B switch for 6 user-defined preset buttons
- Weight Regular Mode: 13.25 lb / 6.0 kg
- Weight, Pole Operated: 17.85 lb / 8.1 kg
- Height: 12.6" / 320 mm
- Width: 12.6" / 320 mm
- Depth: 4.3" / 110 mm
- Nominal power draw: 200W
- Attached Power supply: Yoke Mounted
- AC Power: 100-240 VAC / 50-60 Hz
- Battery Power: 14.4V Battery Plate
- IP Rating: IP20
- Lux, Daylight, 10 ft / 3 m: 3023 lux "open face," 1003 with dome
- Lux, Tungsten, 10 ft / 3 m: 2456 lux "open face," 912 with dome
- +/- Green-Magenta: 0-100 Plus and Minus continuous
- Included Diffusion: Ultra Light (900-3711), Dome (900-3712)

Available now: US $2,250
litepanels.com/en/products/gemini-1x1-hard

Litepanels Gemini 1x1 Hard

Gemini 1x1 Hard "Open Face"

Gemini 1x1 Hard with Ultra Light Diffuser

Gemini 1x1 Hard with Dome Diffuser

Rear Controls and AC Power Supply

Battery Bracket

Anton/Bauer Dionic XT

Open Face, on the ground, with Battery

Top view showing connections and dongle slot

Bottom view showing controls

Litepanels Gemini 1x1 Hard

These 3 setups had a Gemini 1x1 Hard set to 5600° Kelvin. The dimmer was at 100%. A Bluetooth dongle connected to the Litepanels SmartLite Director (SLD) app on either iPhone or iPad. The fixture was 10 feet (3 meters) camera left of the flowers. They were sitting on top of a white milkglass sweep. The Gemini 1x1 Hard was the only light in the room. It was single source. There was a white wall 4 feet camera right of the flowers, The background was flagged with a 4x8 floppy.

1. Gemini 1x1 Hard, "Open Face"

We measure 3660 Lux / 340 Footcandles using the bare fixture, open faced, no diffuser. This scene was shot at T11½, 800 ISO, 24 fps (⅟₄₈ sec).

With the Gemini 1x1 Hard open faced, "bare bulb," without diffuser, this configuration provides the hardest light with the most defined shadows. Also, the background is darkest because less light spills around the solid floppy.

By the way, in Open Face mode, there's no danger to the fixture and I have been assured to your eyes as well.

2. Gemini 1x1 Hard w/ Ultra Light Diffuser

2. The Ultra Light Diffuser comes as an accessory with the Gemini 1x1 Hard. I will probably leave it in the fixture all the time. It is my favorite combination with this light.

We get 2830 Lux / 263 Footcandles at 10 ft / 3 m with the Ultralight Diffuser. That's T11 at 800 ISO, 24 fps. So, it's a loss of about ½ stop, which isn't much. The punchy source wraps a bit around edges to fill in shadows slightly. The background gains a little more spill.

Gemini 1x1 Hard w/ Dome Diffuser.

3. A Dome Diffuser also comes standard with the Gemini 1x1 Hard.

Still at 10 feet from the fixture, the flowers measure 1020 Lux / 95 Footcandles. That's T5.6½ at 800 ISO, 24 fps — a 2 stop loss from the Open Face configuration.

And yet, a Gemini 1x1 Hard with the Dome Diffuser is still brighter than the Gemini 1x1 Soft. At 10 feet, the Hard with Dome gives off 1020 Lux. The Gemini Soft gives off 614 lux.

Notice the background in this shot. It has gained more scatter spill as the light, under softer diffusion, wraps around the floppy even more. Also, shadows are filled in more.

For more information, go to:
litepanels.com/en/products/gemini-1x1-hard

Paul Greengrass (center) with James Goldman (L) and Simon England (R) on *News of the World*. Photo: Bruce Talamon © 2020 Universal Pictures.

Dariusz Wolski, ASC, Cinematographer on *News of the World*. Photo: Bruce Talamon © 2020 Universal Pictures.

James Goldman on *News of the World*

News of the World *was directed by Paul Greengrass. Dariusz Wolski, ASC was the cinematographer. But he was busy working in Italy at the time of this interview, and so we talked to B-Camera/Steadicam Operator James Goldman and Camera Assistants Dan Ming and Simon England.*

Jon Fauer: How did you get started working with Dariusz Wolski, ASC?

James Goldman: I met Dariusz a year out of school on the first "Pirates of the Caribbean" movie, around 2001-2002. I was a camera PA. I did many jobs with him, in many positions, working my way up to camera operator.

I did an article about Dariusz on *Exodus*. He was using the Angénieux Optimo Zooms at that time.

He still uses a version of those zooms. He's never given those up. Every movie he's ever shot with Ridley has been on those zooms and a set of primes for nights.

Those were the Super35 Angénieux zooms. But on *News of the World*, you used Full Frame Angénieux EZ Zooms. I had assumed those lenses were mainly intended for documentaries, ENG and run-and-gun style productions.

News of the World was almost all hand-held and Steadicam. We put the EZ Zooms on ALEXA Mini LF cameras. The main reason I believe he likes them is because they are not unnaturally sharp. He feels they look good on a digital camera. Also, they can take a beating.

You were bouncing around in wagons, working in rain and dust storms, handheld and on Steadicam. Did you use both EZ-1 (45-135mm T3) and EZ-2 (22-60mm T3) zooms?

Yes we did. Part of the reason he liked the zooms was for speed and efficiency. If you want to go closer, just tighten up 3 mm. A lot of the time we were working with just one camera—often just one Steadicam. During the readings to the crowd, we always had three camera setups—handheld, with Steadicam here and there.

You were on Steadicam, Easyrig and handheld?

We used the Easyrig rarely when Johanna, played by Helena Zengel or Tom Hanks were down on the ground in the dust; it was just easier to be down low. The Steadicam was used for the majority of the foot travel in the film, all the horse walking without a wagon and whatever else was needed. This was the first feature I used the Steadicam Volt. It's a very impressive tool. Prior to production, Dariusz had told me he thought we were going to use the Steadiam a lot. He was trying to get Paul away from doing it all handheld. He thought it was going to be a little more elegant as far as a Western went to have a smoother image.

For example?

I remember we did the entire first day of shooting on Steadicam. I heard Paul ask, "Can James wear that for 12 hours every day? And Dariusz said, "Oh yeah, he's in great shape. No problem." And I was like, "Oh, here we go."

Hopefully with a Mini LF. Not the big LF.

Well I had just done a few shows with the full-sized ALEXA 65 so the Mini LF didn't seem that bad.

How does the Steadicam Volt work to stabilize the horizon?

When the Volt first came out, I was hesitant. Then I saw Scott Sakamoto down the street from my house doing a commercial. I

James Goldman on *News of the World*

consider Scott to be the one of best working Steadicam operators in the business. What he does is incredible. I asked him about his Volt. He said, "I wouldn't work without it anymore." The minute he said that, I pulled out my phone and called Tiffen to order a Volt. I figured if it's good enough for Scott Sakamoto, it's good enough for me.

What monitor are you using?

I'm flying the 703 Ultra Bright Small HD.

It looks like there's a Light Ranger 2 on top?

Yes. Dan Ming and Simon England are Light Ranger fans.

Were you shooting pretty wide open, wide apertures?

During the daytime, Dariusz doesn't usually shoot wide open; he keeps around a T4.5. At night, we call him the Prince of Darkness. He's not afraid to go wide open.

What lenses did you use at night?

A lot of the time we used the Angeniux EZ Zooms. Most interiors, where the news is being read, were done on zooms. Primes were used in the night scene where Tom is walking in the rain and when they're walking into that weird cultish town.

Were you mostly on Steadicam the whole show?

If it was not handheld, it was on Steadicam. We didn't have a pursuit vehicle or a dolly. Steadicam shots included traveling shots where they're riding, when they're walking in the woods, scenes with the horse and wagon, and where Helena goes up to the house. It was the hardest I've ever worked on any single film. It was great. 9,000 feet altitude, 10 to 12 hours of Steadicam a day.

Tom Hanks had a great line. We were doing a quarter mile walk on the Steadicam where Tom and Helena are on the horse. We did five or six takes and the wrangler said, "We're going to have to rest the horse." And Tom goes, "Oh, they treat the horse better than you."

Those tracking shots where they're galloping fast across the prairie with a big sky—were they from a camera car?

We had a truck that Mike Popovich set up with speed rail stuff as a shooting platform. We mounted the Steadicam on it. It was a documentary-style feeling. But it was also super fun.

And I guess the Volt can stabilize the horizon while you're operating from the truck?

The beauty of the Volt is that you can tighten up the horizon. It's a two-belt pulley system. It's like a miniature stabilized head to a certain extent. You can tighten up the side-to-side and the front-to-back control. That's what I think puts it light years ahead of anything else. Your biggest challenge is you're just bouncing around. You're trying to minimize any kind of distracting bouncing or off-level movement. To be honest with you, the Volt is probably the best piece of hardware I have seen in the Steadicam business in a very long time. When you set the Volt up, you calibrate it. Somehow it knows where your front to back position is. It is a great tool. I couldn't have done some of the stuff that we get on that job as easily if I didn't have it.

How does the Volt attach?

It goes on the post just like the regular gimbal. You just take off the upper docking stage and the electronic donkey box and you slide it on, lock it in, and put everything back together. And it's

Photo: Bruce W. Talamon © Universal Pictures.

captive. It's an entire gimbal. When you buy it from Tiffen, you buy an entire gimbal. It's going to replace your old gimbal.

And it's compatible, I guess, with not only Steadicam, but the Pro rig as well?

They make a version that you can use with the Pro. I think they would like everyone to buy their entire system, but I also think they realize they're going to sell a lot more of them if they were to make them like that. Its cost is reasonable.

I've thought about buying another one to have just as a backup. It seems like nowadays people expect it. People want some kind of horizon leveling tool on the rig.

The Volt comes with a separate box that's like the brain basically. The gimbal sits on the rig. You have a box that basically runs the gyro and also has all the adjustment. There are no adjustments on the actual gimbal itself. There are a couple of Allen screws to tighten up the belts, but all the actual dialing in and modes are accessed through the control box.

An electric gyro inside of the box is what is actually maintaining level. When you set it up, you basically spin it around the handle that goes underneath the brain. The rig has to be level so that when you engage it and turn it on, that's how it knows where its level is. The gyros in the brain themselves do the talking to the brushless gimbals that drive the belt.

There's a button that you can push to select the modes of the gimbal. The brain has a horizon control, a dampening knob and a front to back tilt knob. All of those are adjustable from 0 to 10.

The whole opearating system is fairly simple.

How do you override the force of the Volt's tilt?

You have to push through it, unless you turn it way down. That's the thing. You get used to it. With the regular Steadicam, when you tilt, there's nothing to stop it. With Volt, let's say you're tilting down. The button that your thumb touches is what actually locks in the tilt. Let's say I tilt up to go up some stairs. I push that button and it in turn holds the angle. This is beautiful when you're circling somebody and they want you to be low when you're circling because you can lock that in there. And then, for the most part, it kind of keeps it at that angle. But if you're doing shots like in "News of the Worlds, where you're moving all the time and you're going from person to person, I had the tilt turned way down. So I'm controlling it and it has less resistance getting in and out of the locked spot.

There's no button to disengage?

No. Every time you hit the button, it basically locks it into where it's pointing.

And the Volt does not lock in on one position, like a gimbal stabilizer?

No. You're doing your own pan. It doesn't do anything like that. It mainly keeps you from getting off level. Everything else, you're still having to pilot, which is what makes it so helpful.

Jon: I thought some of your shots for sure were on a dolly.

No dolly, no remote head or crane. Paul and Dariusz didn't feel

James Goldman on *News of the World*

James Goldman with Steadicam Volt rig and Martin Schaer handheld.

the need for those kinds of toys. I learned a couple of things from Paul that are interesting. For example, somebody enters a room. Usually you would pull them into the room because you want to see their faces, and then you would turn and show the room. I think Paul, coming from documentaries, having been in war zones, sees things as if he's always chasing. You're always following the action, because as a news or documentary cameraman, you're not in front of somebody and back-pedaling; you're chasing into the action. You see what's going on as you enter it.

The dust storm. How did you do that?

A lot of people with fans and bags of dirt, and a lot of visual effects. With the fans blowing, you really can't get a rig in there; it just blows around. It was mostly handheld and there were some Easyrig setups. Martin Schaer has been Dariusz Wolski's A-camera operator for years — they go back to *Crimson Tide* together. We've done three movies together in the last two or three years where he was A camera, I was B camera. He's awesome. I can't say enough about Martin as far as what I have learned from him about operating over the years. He has been a wealth of knowledge.

I guess the camera assistants had lots to clean after the dust storm that night?

Dan Ming and Simon England were busy after wrap a lot of nights. There were a lot of dusty days. The camera assistants worked really hard on this film. Technically, it was difficult for all of them. Pulling focus was tricky. Some of the Steadicam shots were all over the place. There were no marks, we were just out there winging it. Simon worked hard on that movie with all the Steadicam

that we did and we never laid marks.

When did you shoot and where?

James: We finished late November 2019. We were based out of Santa Fe. Locations were within an hour of Santa Fe.

Jon: When you're doing Steadicam, is it mostly with the zoom?

It definitely depends on the DP. On *News of the World*, we had to move fast. Having a zoom makes it so much easier. You don't want to change prime lenses when you're fighting daylight.

Which of the two Angénieux EZ Zooms did you use the most? 22-60 or 45-135?

I think I spent probably 80% of my time on the wider one. But I do remember one Steadicam shot where it was at 135 mm. They were riding a horse up a ridge. And I was walking across another ridge and I was all the way out on the end of the 45-135. I remember thinking, this is going to look horrible. Then we watched the dailies. I was relived. The Volt did a great job. It kept the shot steady and level, with me stumbling through the dirt.

I think everybody is going to be using a Volt in the next year. People are seeing what it's capable of doing. The Volt is just another tool that helps you. With the things that they want you to do a lot of times, as far as Steadicam goes, nothing is getting easier. It's the same for ACs. We are all expected to be faster. "Oh, you don't want to rehearse it? OK, I'll wing it." And at least with the Volt that gives you a little more protection.

How Steadicam Volt Works

Steadicam Volt is also available as an essential standalone accessory for most existing systems, even from other manufacturers. Of course, Volt is integral to the Tiffen Steadicam M-2 System.

As James Goldman explains in his discussion on the previous pages, Volt complements, rather than opposes, normal operating by holding a level horizon. Volt also actively assists in maintaining almost any tilt or roll angle. Its gentle assistance helps overcome the effects of wind, acceleration, or irregular movement.

The amount of resistance can be fine-tuned to match your personal preference. Haptic feedback emulates the fluid-like friction in a tripod head. Volt's assistance can be engaged or disengaged with the single push of a button.

Steadicam Volt consists of two parts. The control box (at right, below) is mounted on the top stage, or directly integrated (as in the M-2. The control box measures the movement of the camera using an accelerometer and gyroscope sensors and communicates with the Volt motor drive unit mounted on the gimbal of the rig.

The Volt motor drive unit (at right, above) applies torque, based on your settings, to maintain the tilt and roll angles. You can work against this torque to adjust angles on the fly. Furthermore, when you release pressure, the sled returns to the preset angle without pendulating.

tiffen.com/pages/volt-system

List price for a standalone Volt ranges from $6,800 to $9,000 depending on the model.

Volt Motor Drive Unit

Volt Control Box

How Angénieux EZ Zoom Works

Preston Light Ranger 2

Angénieux EZ-2

Preston Motor Driver

Steadicam Volt Control Box
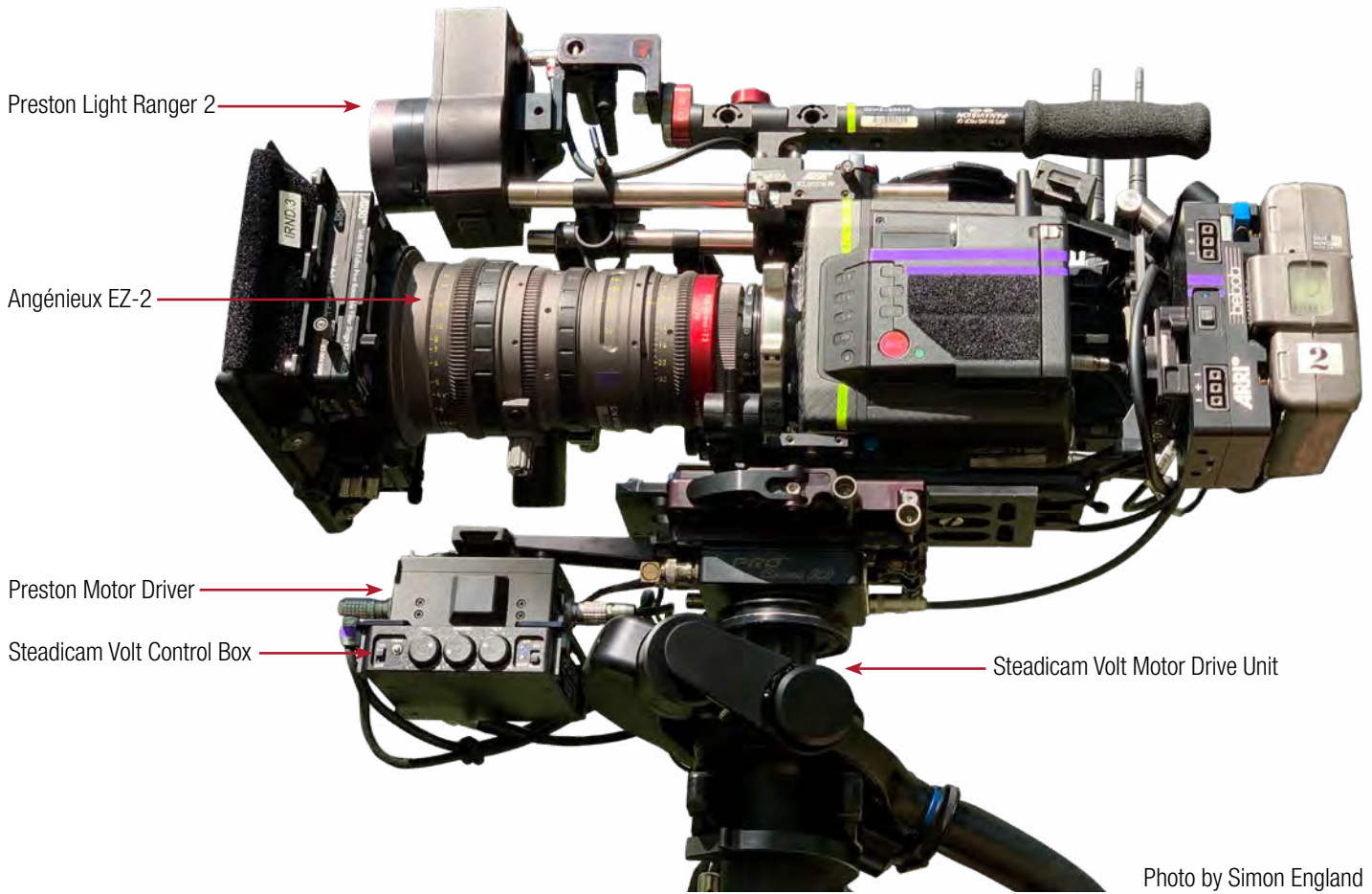
Steadicam Volt Motor Drive Unit

Photo by Simon England

The photo above nicely shows the Steadicam Volt Motor Driver and the Control Box. Sitting atop the Volt Motor Driver is an ARRI ALEXA Mini LF, Preston LR2, Teradek Bolt and an Angénieux EZ2 22-60 mm T3 Full Frame Zoom lens.

Yasuhiko Mikami, who initiated the project at Angénieux, describes the EZ Zoom:

Both EZ1 and EZ2 zoom lenses are convertible from Full Frame to Super35. Some people have asked whether this is essentially a Super35 lens that has an expander when you want to shoot Full Frame. This is definitely not so. It's more the other way around. It is, at heart, a Full Frame lens. To go to a Super35 coverage, the rear conversion unit is more like a speed booster rather than an expander. I have always maintained that DOWN conversion is good, but UP conversion is evil. This simple rule in digital imaging nicely applies to optics as well.

From the very early stage of lens design, it was obvious that an expander would enlarge the image circle by magnifying all the aberrations that are inherent to the front zoom and focus group. So, what we did was to design a Full Frame lens, keeping in mind that there will be a different rear group to shrink the image to S35.

Once the FF version was perfected, designers worked on the S35 rear unit. Then came the most challenging part, as there is size limitation in designing the S35 rear block. The total lens length had to be identical (meaning we could not change the position of the S35 image plane), otherwise we would have had to change the focus scale ring. (We actually did this on the Optimo ULTRA 12x

to maintain pristine quality.) Because the EZ zooms are affordable, the focus scale remains the same. You swap out the iris ring, but the zoom ring is already pre-engraved with both S35 and FF readings. You just slide the window to show the correct focal length.

We wanted to keep it simple for users to be able to make the format conversion themselves. We also did not use as many aspherical surfaces as on the higher-end Optimo zooms, as these elements would escalate the lens build cost.

After we came to the conclusion that a Super35 lens with expander would not be as good as a Full Frame lens with a reducer, then the lens designers went back to the drawing board. They went back-and-forth to figure out the best compromise—all optical design is a compromise— between the S35 image and the FF image.

They had to make sure the rear groups were not too complex, while keeping the same image plane position. The S35 rear group had to provide as good a quality as the FF rear group, and both had to fit within the cost and performance constraints.

One of the most difficult parts of the project for me personally was to convince the engineers to first design the EZ zoom as a Full Frame lens, and then work on the Super35 conversion, rather than the other way around.

I am a product planner and not an optical designer, and so I have great admiration how the optical and mechanical engineers achieved such a compact, lightweight and rugged zoom lens that is also extremely affordable.

Dan Ming Focusing on *News of the World*

Focus Puller Dan Ming with an orange Preston Hand Unit. Simon England with a red Preston HU. Cameras handheld with lots of plastic bags.

Jon Fauer: What was your lens list on *News of the World*?

Dan Ming: We had two sets of Angénieux EZ-1 and two sets of EZ-2 zooms. Also: Panavision PV65, Vista, Vintage Super Speed, Super Speed, Sphero 65, Nikkor 300 and 35-400 T4.8 Primo Plus.

I understand the Angénieux EZ zooms were used about 90 to 95% of the time. Why is that?

Dariusz Wolski, ASC always liked his Angénieux Optimo compact zooms and the EZ Zooms allowed him to carry on with that look on a Full Frame camera.

I thought EZ Zooms were originally intended for affordable productions like documentaries. What compromises are there?

They have some fragility inherent in the design because they are easily convertible between S35 and FF. However, I think the cost difference is Angénieux deciding that with the newer more affordable cameras, there would be a larger demand and market if they designed and priced the lenses to sell more volume.

A lot of DPs like lenses that aren't perfect and exact, so this works for them as well. The EZ Zoom lenses themselves look fine optically and continue the compact Angénieux look for Full Frame.

Were the EZ Zooms rugged enough for your job? It seems your equipment really took a beating with dust, wind, rain, bumping around on trucks and lots of handheld and Steadicam.

The EZ Zooms are very easy [EZ!] to service in the field in terms of backfocus and slipping the focus scale if needed. We did have to make adjustments as the lenses got banged about and cleaned them as needed, so they did the job. The pluses of the lenses are their compactness and light weight. A more rugged lens might lack those important characteristics.

I guess you had a lot of after-wrap cleaning and maintenance?

There was a lot of working in all of the elements, which is par for the course on a western. We definitely had a lot of cleaning to do.

What ISO were the ALEXA cameras rated for INT and EXT ?

800 to 1600 occasionally when needed.

Which Preston Light Ranger did you use?

With so much handheld and Large Format, we mostly were on the LR2-W. We jumped to the LR2s when we had longer lenses.

Comments about Light Ranger on this show?

The LR2s were invaluable. We were frequently in places where

Dan Ming Focusing on *News of the World*

we could not get a good line of sight, so it was great to have the depth overlay.

Since you were running around so much, how could you view a monitor with Light Ranger 2 video overlay?

We had a belt/sling that would have a battery, overlay box and the video receiver on it. That ran to the handset with the monitor on it. This allowed us to be completely portable. The monitor is attached to the FIZ hand unit, with a power cable and BNC to a belt that holds a Dionic battery, Bolt 3000 receiver and LR2 overlay box.
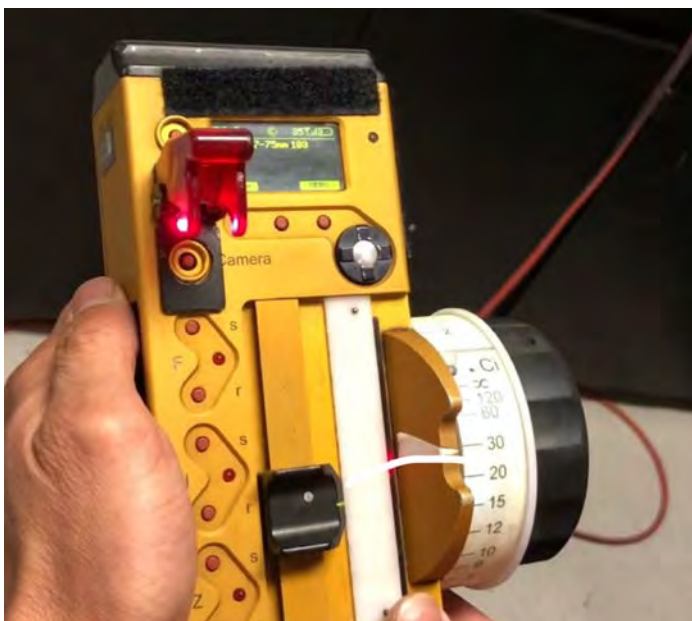
Cure for the irresistible urge to cut when the AD shouts "Cut" but you need to wait for the tail slate. Dan Ming's remedy: a Tails cover on his gold anodized custom Preston Hand Unit protects the camera On/Off switch from over-eager fingers.

Simon England Focusing on *News Of the World*

Simon England pulling focus in profile to judge distance from actors to James Goldman on Steadicam. LR 2 is mounted above Angénieux EZ zoom.

Jon Fauer: In the photo above, how did you manage to pull focus with a Preston wireless lens control, working with a Preston Light Ranger 2, and still be able to see the LR2 video overlay for focus on a monitor while you're running around?

Simon England: I made a back sling rig. I have a custom battery belt with 3 Anton/Bauer battery plates attached. The batteries clip on there. We used the new Anton/Bauer XT90 batteries.

A Teradek receiver and the Light Ranger video overlay unit attach to a custom sash arrangement. The battery also runs power for the Light Ranger feed of the focus overlay to a bright SmallHD Cine7 monitor that is attached to my Preston Hand Unit. I want those to be as light as possible, without batteries inside or onboard. There are just two cables coming off it—video and power. The video overlay unit is in back and I can actually reach over my shoulder to change the Light Ranger settings.

The monitor is there mostly for framing. I'm pretty traditional; that's how I learned—to focus by eye. But now, having the monitor and the Light Ranger readout, if I get into a bind, I can look at it and correct. The 7" is not as good as focusing on a big 13" monitor. But that wouldn't have been practical in our situations where we are walking hundreds of yards with the actors during long takes.

How do you attach the SmallHD monitor to the Hand Unit?

David Berryman at Clean's Camera Support makes a Preston Hand Unit Monitor Bracket. He's also a camera assistant, and he makes a lot of accessories that are popular across the field.

How did you keep the equipment clean?

We bagged the cameras with plastic. It was a long cleanup at the end of the day. Lots of compressed air. We've got a lot of different kinds of brushes. There's a lot of wind, rain, dust in New Mexico.

You and Dan Ming have custom Preston Hand Units.

He's got a gold one; mine is red. At one point, we took the Hand Units to Preston. They took them apart. Then we had them anodized. It's a tool we use all the time. So it's nice to make it your own.

You mostly used Angénieux EZ-1 and EZ-2 Zooms?

Those EZ zooms were probably 90% of the show. We had two for each camera and we'd go back and forth between those. The prime lens set was essentially for night or those dusk scenes trying to shoot down to the last bit of light.

I think that the reason Dariusz likes them is because they are what everybody's been searching for in the past couple of years of digital: lenses that have character and inherent issues that make them softer. It's not a perfect lens and it's interesting. They're a great size. They have a good range and stop for a Large Format zoom. You get a T3.0. They fit the bill to put on the Steadicam for James to walk around all the time. To go from Steadicam to handheld mode, I just slide the camera and zoom off the plate, attach the handle bars and we were ready to go. We could go back and forth really quickly.

I'm sure James told you about the Steadicam Volt? It's a totally different way of operating Steadicam. Just like the Light Ranger 2 is a different way of pulling focus—making it much more accurate now. If James moves the camera the tiniest little bit, I can see it. Whereas if you were looking at a monitor without the Light Ranger's video overlay, with a 100mm lens, you're not going to see that two-inch movement of the camera. But now I can.

You can tell by the movement of the overlay bars?

Yes. If I start to see the bars moving, either the actor's moving or the camera's moving. I'm mostly watching the actor. So that means the camera's moving,

If the actor is just sitting in a chair and the camera is pushing in, I can see the speed as I'm turning my focus knob. If I see the bars drift up, I know I need to go faster based off what the camera is doing. You're really playing with depth of field and knowing what it is. Also, I'm able to see focus splits with the Light Ranger. If you have two people at different distances and you're trying to hold focus on both, I can play the front actor long and the rear actor short so that I can make sure that I'm holding the two. Whereas,

Simon England Focusing on *News Of the World*

Simon England with his Preston HU, SmallHD Cine7, battery belt, custom sling with Video Overlay, Teradek Rx. Above right: English Stix.

back in the film days, you'd take out your Kelly calculator and do all that. We don't have time for that anymore. I can see it on the spot and in one take.

On the Preston Light Ranger 2, how do you work with the splits? You just make sure that both actors are in green?

It's funny, I actually use yellow because I think green is distracting and too bright. Also, I have the Light Ranger really dimmed down with a very soft overlay on the screen.

Is your 7-inch SmallHD monitor sharp enough for you to actually see the actor in focus or not?

I typically use the 1303 HDR monitor. I have the Cine7 now as my run-around monitor. It's definitely bright enough. I give it just a little kiss of peaking. That can really help. I think a lot of times people turn the peaking up way too high, so it actually is giving you a high contrast image that makes it look sharp, even though it's not actually accurate.

How do you set up the wireless video?

We had a Teradek Bolt 3000 XT, and it worked great. I have a couple of different receivers based on my build so that I don't have to move it around. I have one built onto my belt-sash. Another is on my 13-inch monitor. I have another for the 7-inch SmallHD that Dariusz sometimes wanted when he needed to be close to the action. So they're all ready to go.

You're getting the video feed directly from the camera?

Yes. And that's a big thing too, because Ryan, our DIT, might be coloring. So we're all seeing log. I actually like that better because I have a bunch of different LUTs that I created myself to allow me to see focus better in different situations. Sometimes I have it super contrasty or if the scene is really dark, I have the mid-tones lifted really high so that I can still see the actors' faces. But if you were to go over to the director's monitor or DIT village, the picture could be the way Dariusz intended: super dark and you could barely see their eyes. That's great for them but not for me and focus.

I notice that on the EZ zoom, you don't have any support bracket underneath the lens?

No support. Those lenses are light enough so they are not pulling on the mount. It's not like having a big lens. I know that a lot of lenses like that have support brackets. Even on the Super35 Optimo zooms like the 15-40, we never used supports; we treated them like primes. And yet, there are primes that are much heavier than EZ zooms and they don't even have supports.

Primarily the EZ zooms were our workhorse lenses. We were using both of them pretty much all all day. I'd switch between the two along with my Light Ranger. If we were to go above 65 mm, I would go to LR2. If we were on the wide zoom, then I'd have the LR2-W. The Light Ranger 2 gives you really valuable information. When Tom has his hat on, which was most of the time, the Light Ranger wants to read the brim of the hat. But it also shows me bars so I can see focus for his eyes and nose. Having 16 different focus measurements on the face is a pretty incredible tool.

Last question. Tell me about your English Stix slate business.

The slate business started back in about 2011 when I was doing a film and wanted to do some custom graphic work. So, I ended up down a rabbit hole learning the process and bought a set of small machines to try out. From my small apartment to now a thriving business, we have grown to create and manufacture slates for most motion picture and television shows worldwide.

I run the company with some help from my wife Melissa, an office manager, and shop team to process orders. The majority of the graphic work is still done by me.

We run about 10 to 15 shows a week at times. Its difficult to manage both an AC career and running a small business but I enjoy putting a little creativity back into the industry. The slates can become an integral part of promotional material and the branding of a show or film.

Check out some of our work at *www.englishstix.com*

Above: Simon England picks up sticks–Ronford Heavy Duty legs. Simon said, "We primarily used the tripod as a landing platform to hike into the set to be able to change modes when converting to Steadicam or a place to dock when changing lenses. The Vermont cart that Jason Sigel is pulling has all of the B-Camera accessories for Steadicam, Studio, and Handheld. We used this cart for most of the film as our normal camera cart."

Right: James Goldman handheld, stabilized with an apple box. He said, "It's better than a 'burito' which is a furniture pad rolled up tight."

Below: Martin Schaer in foreground.
Photo: Bruce W. Talamon © Universal Pictures.

Vocas Accessories for Sony FX6 with Angénieux EZ Zoom

Vocas Top Handle

Angénieux EZ Zoom

Sony FX6

Top cheese plate for the Sony FX6.

Vocas PL to E-mount adapter with top support that attaches to top cheese plate for the Sony FX6.

As we saw in the *News of the World* BTS stills, the Angénieux EZ Zoom is light and rugged and does not require bottom rods or a lens support. On an E-mount camera like the Sony FX6, the EZ Zoom can be secured with the Vocas PL support that wraps around the PL-to-E-mount adapter and bolts onto the top cheese plate. This relieves weight on the E-mount.

In the photo above, the rods are an extra support bonus. Note the support bracket can screw into the top of the lens. The FX6's monitor can slide forward on the 15mm rod thanks to the Vocas LCD monitor support bracket.

vocas.com

Vocas LCD monitor support bracket.

Chrosziel CDM and AKS on Sony FX6 with Angénieux EZ Zoom

In this view, the CDM zoom motor is mounted higher on the lens to reveal the lens's right focus barrel.

Chrosziel Shoulder Set

Handgrip Extender

3.5mm 4-ring connector for Sony FX6, FX9

Chrosziel's CDM-EZ-Z2 enables control of your Angénieux EZ Zoom lens on a Sony FX6.

(The March edition of FDTimes showed how the Chrosziel zoom motor worked on a Sony FX9.)

So, back to the FX6. The camera comes with a nice handgrip with a zoom rocker control. A couple of things were left for companies like Chrosziel to provide—like a handgrip extender, shoulder mount kit and zoom motor—all shown at left.

The CDM-EZ-Z2 is a compact lens motor that attaches directly to three pre-existing tapped threads in Angénieux Type EZ zooms. The 2.5mm hex-headed screws are captive so you won't go scrambling with a magnifying glass when you attach and detach.

The CDM-EZ-Z2 is not like a traditional zoom lens servo control with motors for each lens barrel. This is for zoom only. Zoom with the thumb of your right hand on the handgrip's rocker control. Your left hand manually adjusts focus and iris. Many documentary cinematographers like to work this way.

Sony calls the FX6 handgrip a grip remote control. Attach it to Chrosziel's adjustable handgrip extension. The camera end of the extender has an ARRI-style Hirth tooth rosette. It comes with a female threaded rosette that attaches to the right side of the FX6.

Chrosziel's FX6 Y-cable connects the handgrip cable to the camera's 3.5mm remote control socket on the camera's right side. (They don't call it LANC.) The other end of the Y-cable plugs into the CDM-EZ-Z2. Another cable connects CDM-EZ-Z2 to the camera battery's D-Tap.

Note: the Sony BP-U35 onboard 14.4 VDC Li-Ion battery that comes with the camera doesn't have a D-Tap. But several after-market ones do.

Chrosziel's CDM-EZ-Z2 zoom motor is beautifully machined with smoothly rounded edges in a rugged aluminum housing. It measures a mere 3" x 3" and weighs 6 ounces.

Price is approximately $1,726. It add grace to your smooth moves and elegance to your EZ1 and EZ2 Angénieux zoom lenses on an FX6 camera.

CDM-EZ-Z2 also fits the Sony FX9.

chrosziel.com/dealer-network/

Angénieux Optimo Prime Silver, Gold and Platinum Sets

Angénieux Optimo Primes come as sets of 6, 9 or 12 lenses.

The **Silver** set of 6 lenses consists of 21, 28, 40, 50, 75 and 135 mm, all T1.8.

The **Gold** set of 9 lenses adds 18mm T2, 32mm T1.8 and 100mm T1.8. So: 18, 21, 28, 32, 40, 50, 75, 100 and 135 mm.

The **Platinum** set of 12 lenses adds 24mm T1.8, 60mm T1.8, and 200mm T2.2. So: 18, 21, 24, 28, 32, 40, 50, 60, 75, 100, 135 and 200 mm.

All Optimo Primes have the unique ability to customize their look.

Lens technicians can replace aperture assemblies with iris leaves of various numbers and shapes (even oval) provided by Angénieux. They can also replace a swappable internal optical element to affect several parameters including MTF, diffusion, streaking, flares and color. On location, users can adjust the look even further with front and rear filters.

To locate an Angénieux distributor, go to: *angenieux.com/find-a-distributor/*

Optimo Primes come in PL mounts.

They are color-matched to Optimo Zooms.

LDS and /i technology lens metadata is built in.

Front diameters are all 95mm except the 200mm lens which is 114 mm.

Band Pro Optimo Prime Case and Chart

Amnon Band likes to think outside the box. Now he's thinking inside the box.

As the exclusive distributor of Angénieux Optimo Primes in the Americas (and I heard possibly Greenland as well), Band Pro supplies a free, custom-configured, stylishly graphic Innerspace case with every set of Optimo Primes. A Silver set comes in one case; Gold and Platinum sets come in two cases.

Once upon a time, a long time ago, Angénieux 12-120 and similar 16mm format zooms were delivered in burgundy-color leather jewelry style cases. The style continues.

And speaking of boxes, each set of Optimo Primes from Band Pro also includes a free Prêt à Tourner (PAT-ACC) Mega Sharpness box—a high resolution lens test chart with holder and accessories.
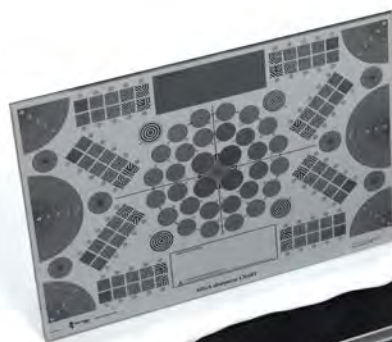
How to Use the PAT-ACC Mega Sharpness Chart
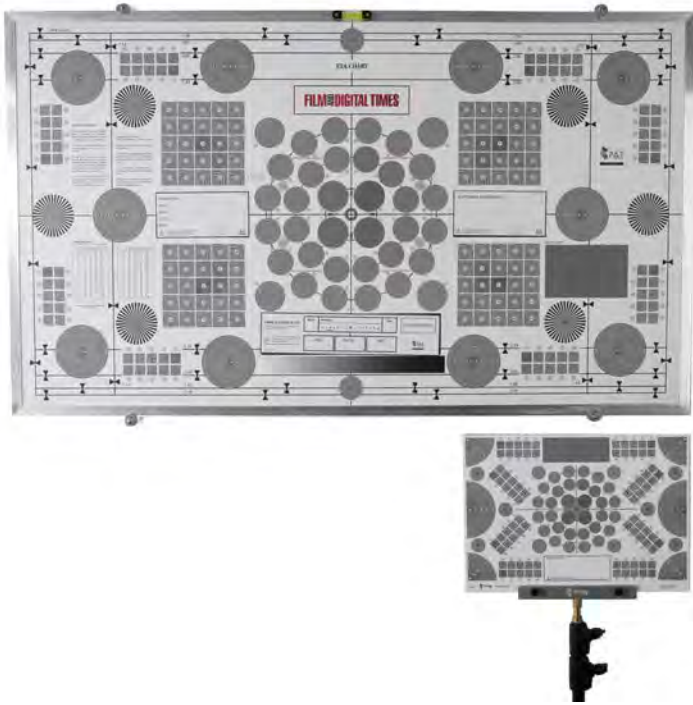
The large EXA chart, above, from Prêt à Tourner (PAT-ACC) is what you'll usually find at rental houses. Or perhaps they will have the even larger YOTTA charts.

The smaller chart shown above right is a Mega Sharpness Box. This is the one you get free when ordering an Optimo Prime set from Band Pro. The chart is neither a box nor Mega in size. But it's a catchy name. In fact, it is small enough to fit conveniently inside your lens case.

The math works out as follows. The distance from camera to chart should be 50 times the focal length of the lens. So, with an 18mm lens, the image plane to chart distance should measure 900 mm. (18 x 50 = 900. That's 35.4 inches — divide mm by 25.4.)

A 200mm lens should measure 10,000 mm from image plane to the chart. (10,000÷25.4=393.7 inches = 32.8 ft.

PAT-ACC charts consist of concentric circles and patterns with numbered captions. Find the target with the finest definition and its corresponding number. Then refer to the correlation table online at *pat-acc.com/en/technical-information/* to determine the resolution in line pairs /mm.

The beauty of a PAT-ACC chart is being able to quantify resolution of the lens together with the camera being used. Stéphane Paillard is a former Camera Operator and Camera Assistant in France who designs and supplies these high-tech lens charts and accessories.

Lens charts have been around since the 19th century. Siemens stars and vintage charts previously graced the walls of rental houses and manufacturers until recently, and now their walls are festooned with PAT-ACC charts.

Stéphane realized that conventional printing techniques yield fuzzy lines. And so, PAT-ACC charts use special inks and laser processes that exceed many lens projector reticle resolutions.

"But isn't a Mega chart too small to test the entire lens?" you may ask. Yes, but because it attaches to a stand, simply move the chart to the optical center and then to the corners.

For example, let's check a 135mm Optimo Prime at 6 feet. Yikes, the focus scale is 4 inches off, at 6'4". (See above.)

Optimo Primes have been calibrated with their 2mm thick clear rear filter (optical flat) installed. This reminds us to screw it back onto the rear.

But if the lens were truly off, you could measure the difference between the taped distance and the eye-focus distance with a metric ruler on the lens scale itself. Most lens technicians know by experience what to do.

Formula to Determine Shim Thickness

Howard Preston explains the formula to calculate the thickness of the shims required to be added or taken away in the lens mount:

- To relate the change in back-focus (image distance) required to compensate for an error in object distance, start with the simple lens formula: $1/f = 1/i + 1/o$

- Where f = focal length, i = image distance, o = object distance.

- Re-write the expression for o in terms of i, f: $o = i \cdot f/(i-f)$

- Differentiate o with respect to i: $do/di = d/di \; (i \cdot f/(i-f)) = -f^2/(f-i)^2$

- A bit more algebra: $di = -do \cdot (f-i)^2/f^2$

- Finally, rewrite the right hand side to replace i: $di = -do \cdot (f/(o-f))$.

- di represents the small change in the back focus of the lens due to a small change (the error) in the object distance do.

- Once you know do, you also know the thickness di of the shim required to correct the focus error.

Example calculation:

- Lens fl = .1m, error in object distance .01m at object distance do = 5m

- Shim thickness: - (.1m/4.9m)· (.01m) = -.000204m (204 microns)

FUJIFILM GFX100S Larger Format

GFX100S (above)
Size (WxHxD) 5.9 x 4.1 x 3.4" / 150 x 104.2 x 87.2 mm

GFX100 (at right)
Size (WxHxD) 6.2 x 6.4 x 4.1" / 156.2 x 163.6 x 102.9 mm

"Watch what they do, not what they say" is an expression made popular by news commentator Rachel Maddow. It applies to us in the cine world as well. Watch what still camera manufacturers do. What they do often signals where we are heading.

Canon's 5D Mark II, launched in March 2012, and Sony's Alpha 7, launched in Oct 2013, foreshadowed Full Frame Cine. As Bartlet repeatedly asked in *The West Wing*, "What's next?" What's next could be a democratization of Medium Format for Motion Picture Production. This is not based on any roadmaps or violated NDAs. It's just a gut feeling while watching the inexorable progress of technology, the desire to try different things, and the sirens of showbiz seeking the next big thing, bigger than Full Frame.

And so, watch what FUJIFILM has been doing with digital Medium Format cameras. Actually, Fujifilm's Michael Bulbenko pointed out that Medium sounds smaller than Large Format, which is what ARRI calls Full Frame, a size formerly known as Leica Format. For now, let's call it Larger Format.

Fujifilm's first mirrorless Larger Format camera, GFX 50S, was announced at Photokina in September 2016 and released in February 2017. Its G-mount had a 26.7 mm flange focal depth and an inside diameter of approximately 65 mm. The sensor was 51.4 megapixels, 43.8 x 32.9 mm—1.7 times larger than Full Frame.

FUJIFILM's GFX 50R was announced at Photokina in September 2018; it was smaller and more affordable and had the same size sensor. At the same time, FUJIFILM also introduced GFX100. Its sensor was the same Medium Format size but resolution was doubled to 102 MP (11,648 x 8,736). The GFX100 had 5-axis in-body image stabilization (IBIS) and up to 4K DCI internal 10-bit video recording using the entire sensor width. Its OLED EVF had a resolution of 5.76M dots.

On January 27, 2021, FUJIFILM introduced the GFX100S. It is shipping now. Incredibly, this Larger Format GFX100S is smaller and lighter than many mirrorless Full Frame cameras. The 5-axis image stabilized sensor remains at 102 MP. Phase detection autofocus enables extremely fast and accurate focus, measuring almost the entire sensor, at speeds of up to 0.16 second, even in very low light.

The body weighs a mere 900g / 1.99 lb with battery and SD card.

Sarah Horton, who discussed Rosco backdrops on *The Father*, was interested to hear about Pixel Shift Multi-Shot with the GFX100S to shoot ultra-high resolution 400MP stills with amazing detail.

In video mode, the GFX100S can record onto internal SD card up to 4K DCI 4096×2160 H.265/MOV 4:2:0 10-Bit 29.97 fps at a data rate of 400 Mbps. An HDMI D (Micro) connector outputs 12-Bit RAW DCI 4K up to 29.97p for external recording.

But what about lenses? Did we not hear somewhere that Medium... er...Larger Format lenses were bigger, heavier and slower?

Not so. FUJIFILM's GF lenses, with their shallow depth G-mounts for GFX mirrorless cameras, are small, lightweight, fast and high performance. The latest FUJINON GF80mm F1.7 autofocus lens

is a mere 3.9" long, with a front filter thread of 77 mm, and weighs only 1.75 lb / 795 g.

Furthermore, FUJINON's Premista Full Frame Cine Zoom lenses amazingly cover the GFX100S Medium Format sensor. See the following pages.

So, as the news pundits say, "Watch this space."

Fujifilm GFX100S

Resolution: 102 MP (Effective) 11,648 x 8736
Sensor Size: 43.8 x 32.9 mm
Stabilization: IBIS 5-Axis
ISO: 100 - 12,800 (Extended: 200 - 25,600)

Shutter: Mechanical Focal Plane, 1/4000 to 3600 Sec in Manual
            Electronic, 1/16000 to 3600 Second in Manual Mode

Video: Internal to SD Card H.265/MOV 4:2:0 10-bit and 8-bit
                DCI 4K (4096 x 2160) @ 23.976, 24, 25, 29.97 fps
                UHD 4K (3840 x 2160) @ 23.976, 24, 25, 29.97 fps
                DCI 2K (2048 x 1080) @ 23.976, 24, 25, 29.97, 50, 59.94 fps
                Full HD (1920 x 1080) @ 23.976, 24, 25, 29.97, 50, 59.94 fps

Video: External 12-bit RAW via HDMI Output
            DCI 4K (4096 x 2160) @ 23.976, 24, 25, 29.97 fps
        External 4:2:2 10-bit via HDMI Output
            DCI 4K (4096 x 2160) @ 23.976, 24, 25, 29.97 fps

EVF: 0.5" 3,690,000 Dots with -4 to +2 diopter adjustment
Monitor: 3.2" 2,360,000 Dot 3-way tilting touchscreen LCD

WxHxD: 5.9 x 4.1 x 3.4" / 150 x 104.2 x 87.2 mm
Weight: 1.98 lb / 900 g (body with battery and SD card)

Fujifilm GFX100S

Sensor Size Comparisons

FUJIFILM GFX100S Larger Format
43.8 x 32.9 mm overall
55 mm ⌀
> **43.8 x 24.6 in 16:9**
> **49.5 mm ⌀**

ALEXA 65 Digital Motion Picture Camera
54.12 x 25.58mm
(2.1:1 native aspect ratio)
59.86 mm diagonal

ALEXA Mini LF Open Gate
36.7 x 25.54 mm
44.71 mm diagonal

Arriflex 765 film camera
52.5 x 23.0
57 mm diagonal

ALEXA Mini Open Gate
28.17 x 18.13 mm
33 mm diagonal

RED 8K VV
Panavision DXL
21.60 x 40.96 mm
46.31 mm diagonal

Phantom 65
51.2 x 23.3 mm
56 mm diagonal

RED Dragon
30.7 x 15.8 mm
35 mm diagonal

Sony F65
24.7 x 13.1
28 mm diagonal

Sony VENICE, Sony alpha, SIGMA fp L,
Leica Format, Full Frame Stills
36 x 24 mm
43.27 mm diagonal

VistaVision
37.7 x 25.0 mm
45 mm diagonal

GFX100S with 19-45 mm T2.9 Premista

FUJINON 19-45 mm T2.9 Premista Full Frame Zoom lens covers entire Medium Format sensor of FUJIFILM GFX100S with PL to G-mount.

GFX100S with 19-45 Premista

DJI Mavic Air 2s

Images on this page courtesy of DJI

DJI Mavic Air 2s

The new DJI Mavic Air 2s combines thrill of flying and amazing image capture. It is nimble, superb in low light, and super steady—even as a tripod in the sky. You can film in 5.4K or take 20 Megapixel stills. The 1-inch sensor has 2.4 micron photosites — significantly larger than the Mavic Air 2 camera's 0.8 micron photosites. This contributes to gorgeous picture quality and great dynamic range. The camera is stabilized by a 3-axis gimbal. You can record in H.264 or H.265—with Normal (8-bit), D-Log (10-bit) or HLG (10-bit) modes.

In comparison, the DJI FPV on the following 2 pages is a high performance craft, like a big battery with propellers. The FPV has a 1/2.3" CMOS sensor with 12M effective pixels. Its field of view is 150° (equivalent to 14.6 mm in 35mm format). Maximum video resolution is 3840x2160. Stabilization is single axis for tilt.

DJI Mavic Air 2s

- Takeoff Weight: 595 g
- Dimensions Folded: 180×97×77 mm (L×W×H)
- Unfolded: 183×253×77 mm (L×W×H)
- Max Flight Time (no wind): 31 minutes
- Sensor: 1" CMOS
- Effective Pixels: 20 MP; 2.4μm Photosites
- Lens Angle of View: 88°
- Maximum Aperture: F2.8
- Minimum Focus: 0.6 m / 1' 11 ½"
- Video ISO: 100-6400 (Auto) ; 100-12800 (Manual)
- Video 10-Bit D-Log-M ISO: 100-1600 (Auto), 100-3200 (Manual)
- Photo ISO: 100-6400 (Auto); 100-12800 (Manual)

- Still Image Size: 20 MP 5472×3648 (3:2) or 5472×3078 (16:9)
- 5.4K Video: 5472×3078 @ 24/25/30 fps
- 4K Ultra HD: 3840×2160 @ 24/25/30/48/50/60 fps
- Also: Additional resolutions and frame rates
- Formats: MP4/MOV (H.264/MPEG-4 AVC, H.265/HEVC)
- Max Video Bitrate: 150 Mbps

Jonathon Brearley piloting DJI FPV at MIT with FPV Goggles V2. Photo: Marlena Fauer.

by Jonathon Brearley

The DJI FPV drone is surprisingly easy to fly when compared to consumer drones like the Mavic Air or Air 2. Perhaps because of its nippy and nimble controls, or its ability to make tighter turns, my confidence in flight was significantly heightened. Even with the Mavic Air 2 in sport mode, the power and agility of the FPV system is what defines it. The FPV system's precise navigation makes it feel extremely easy to position the drone in the sky, especially when flying line-of-site. Of course, with this drone, the intention is not to fly line-of-sight at all; the intention is to use the superb first-person-view (FPV) goggles that provide the pilot with a high definition stream of the 150˚ FOV drone camera. These goggles are so immersive, I found myself swaying back and forth, tilting my head with the roll, pitch, and yaw of the drone as you might do in an airplane or a roller coaster. If you've had dreams of being a bird, free to roam the skies, this might be the closest you'll get to living them with your feet planted safely on the ground. It's slightly uncanny how natural the flight felt, especially the ability to assess depth and proximity of obstacles through the goggles, something I do not find easy to do while flying other phone-screen operated drones.

A word to the ease of use of this aircraft: seamless. Initially, I was concerned that it might take 20 to 30 minutes to configure and set up the whole system. Not so. If you are familiar with any of the DJI systems, it is as easy as attaching the props, two press-and-holds, and the drone is ready to fly. There is only one downside to how powerful this drone is – flight time. With our one battery included with the review unit, low temperatures of early spring in Cambridge, Massachusetts and zealous zipping around, flight

times didn't last much longer than 10 minutes. But having spare batteries certainly will solve that.

In my mind, among many other possibilities, we're interested in the applications of this system beyond hobby flying and drone racing: one is in film and the other is the architecture and construction industry. An application where the FPV drone would shine is in capturing action/extreme sports, (I'm thinking skiing, surfing, mountain biking, sailing, etc.) Whether used for a feature film, a more quotidian shorter format online video, or for internal review, it would be completely reasonable to think that athletes and coaches could find a tool like this extremely valuable. While a consumer or prosumer drone could do this, the agility and speed of the FPV system make it particularly attractive for this application.

A second application in the film industry is in fast action shots. Picture incredible FPV shots flying up and down canyons, waterfalls and bridges, even through city streets. Traditional FPV drones that are capable of capturing that sort of footage take many hours of flight and pilot experience to get smooth, usable footage. This system, using the intelligence of the DJI flight controls, opens up a whole style of shot at a lower cost and flight experience threshold. In many ways, this drone seems poised to popularize that style.

I also wonder, the drone aside, does the use of the FPV goggles have an application in the film industry for the director and their team? Rather than using a monitor to view the shot, could you image a camera operator, DP or director using FPV goggles on set?

From an architecture student's perspective, the use of drones has

UHD video framegrab from DJI FPV's 150° FOV lens examining MIT's Dreyfus Chemistry building's west facade designed by I. M. Pei in1967.

proven extremely formative and valuable. The ability to explore a potential site in real time, to film and photograph it, and even use photogrammetry to create a 3D model from the footage, makes the design process easier and more informed.

The real power of this system is not only in the ability to record and capture footage of a site to review later, but also in the capability to explore in real-time and in an extremely immersive way. For the majority of build sites, a visit on foot or by car could be sufficient. But when considering building sites that are remote, forested, or otherwise difficult to access, this type of drone would be extremely useful.

One of the most robust applications for this system is in construction management and construction administration. From both a contractor and an architect's perspective, the ability to easily and precisely investigate difficult to access areas of a building under construction would be extremely convenient. Imagine a scenario with a question about the facade detail on a construction site. As part of the construction RFI (request for information), the construction manager would include drone footage and images from the area in question to the architect. In another scenario, the architects, upon arriving for a site visit, might begin with a short drone sweep to check progress. This is where the goggle sharing and second monitor feature become especially handy. One pilot might fly through the goggles and a team of others could watch on a second monitor and ask to be shown other angles or parts of the site.

The DJI FPV system would enable easy capture of interior "walkthroughs" of spaces for clients and architects alike. Digital fly-through renderings are a popular way of presenting a project to clients because, unlike still images, they produce a cohesive understanding of how spaces flow together. Capturing a walk-through video of a built building would be an excellent way to communicate a firm's design logic to future clients and help them experience spaces that have been successfully brought to completion. This includes transitions from exterior to interior, interior to interior, and interior to exterior shots that tell a story of spatial relationships. The FPV is well-suited for this kind of walk-through because the flight control is optimized for dexterity and forward movement compared to the Mavic's tamer flight control that favors open space.

It is important to note that in all of these applications, precautions are needed to assure the safety of everyone in the immediate context. A spotter is essential when the pilot is wearing the FPV goggles. The spotter is there to warn of any obstacles outside of the, albeit extremely wide, field of view. In the standard system, the props do not have a cage that could help protect subjects and objects from a collision.

The DJI FPV is an impressive system that has a convincing number of applications. It seems there is lots to look forward to beyond the racing space, especially when considering camera sensor expertise at DJI. It's not hard to dream of a future iterations of this drone that include a "cinema" camera on a 3-axis gimbal, like the Mavic, in addition to the current single axis FPV camera—giving you the best of both worlds.

Jonathon Brearley is a Master of Architecture at the MIT School of Architecture Planning. His love of the architectural plan pairs well with his enthusiasm for flying drones to explore his surroundings from the sky.

Sony G Master 14mm F1.8 Rectilinear Full Frame Lens

Weight	16.3 oz. / 460 g
Size (Ø x L)	3 3/8 x 4" 83 x 99.8 mm
Iris	9 circular blades
M.O.D.	0.25 m / 0.82 ft
Filter	Rear gel holder
Mount	Sony E-mount

The new FE 14mm F1.8 G Master is Sony's 44th Full Frame E-mount lens and the 14th G Master. (There are 20 additional Sony APS-C E-mount lenses.)

As a Sony spokesperson explained in a pre-release discussion, extremely wide and incredibly distortion-free lenses have typically been rather large, heavy, expensive and specialized.

Sony's new wide angle, Full Frame 14mm F1.8 G Master (model SEL14F18GM) benefits from the advantages inherent in E-mount short flange focal depth optical design.

Rectilinear! The 14mm G Master is a wide angle lens with minimal geometric distortion, even at the edges of its 114° field of view. This is a lens for architects, designers, and anyone who cringes when the vertical sides of buildings bow, horizons buckle or horizontals barrel. The 14mm GM fits Sony still and cine cameras. Even VENICE.

There are 14 elements in 11 groups, with a molded XA (extreme aspherical) front element, along with several ED and Super ED (Extra Dispersion) elements to minimize aberrations.

Resolution and contrast are extraordinary corner to corner. This 14mm G Master will be an excellent choice on cameras capturing aerials along narrow canyons or honoring Kubrick and Garrett Brown ASC as they chased low and wide down the corridor behind Danny's bike in *The Shining*. All this at a fraction of what these ultra wide lenses used to cost. Now less than $1,599.

Sony G-Master 14mm F1.8 Rectilinear FE Lens

Framegrabs from FE 14mm F1.8 GM Sony Lens Introduction video on the Sony Alpha Channel. Above: Kikuchi City Central Library, Japan.

John Strandh on *The Hunters (Jägarna)*

Easyrig on *The Hunters (Jägarna)*. John Strandh, cinematographer. Photo by Marcel Köppe.

John Strandh was DP on The Hunters (Jägarna *in Swedish), a crime drama set in the North of Sweden, which is 95% forests.*

Jon Fauer: Can you please describe the production still, above?

John Strandh: We were in Luleå, in Swedish Lapland, a few miles South of the Arctic circle. Naturally, we ended up in some difficult locations for moving the camera with big equipment like cranes or dollies. The Easyrig with a gimbal was our savior for a lot of scenes.

The BTS photo is a scene at the end of the first episode. The woman with glasses is head of the police and the guy in a plaid shirt has been in a forest wildfire. They are hunting a criminal who disappeared. This is an intense dramatic scene where the characters walk and talk. There were police cars and tents for the forensic technicians. We used the Easyrig with a STABIL stabilizer and Ronin gimbal to be able to follow the actors and not restrict them.

Adrian was the grip/Easyrig camera operator and I did the pan and tilt with a Ronin controller. You can see the new buckle system from Easyrig, that works like a larger version of a modern ski buckle, to ratchet tight and release.

Ljud & Bild Media was the rental company supplying our production. Our camera was an ARRI ALEXA Mini with Master Anamorphics prime lenses, shooting in a 2.39:1 aspect ratio. I like quite clean lenses. The Master Anamorphics don't have all those crazy anamorphic aberrations. I think they suit my way of working. That's also the case with the ARRI Signature Primes. I like them as well. I used them with the ALEXA LF on some commercials.

What was your shooting schedule on *The Hunters*?

About 65 days. 6 episodes. 10 days per episode.

And lighting?

We were lucky with the weather. We wanted sun because the story takes place during a very hot summer. There's a wildfire going on. We adjusted to where the sun was. Sometimes we put one big 18K in the distance, but overall we tried to be as natural as possible.

How did you start in film?

I went to Stockholm Film School. It's focused on getting people into the business with enough knowledge to be able to work their way up, rather than becoming a director or DP right away. It was excellent for me because I started out in university studying film history. I'm very glad I did, but I decided that I preferred shooting film rather than reading about film. I changed course there. And then, as everyone else, I started out as an assistant and then shooting music videos and short films.

How large was your crew on *The Hunters*?

About 10: focus puller, video playback, key grip, grip, gaffer, and 2 electricians. For larger setups, we brought in additional crew.

Panasonic LUMIX Updates

Blackmagic Video Assist 12G HDR

LUMIX S1H

Panasonic LUMIX S Series and BGH1 cameras get firmware updates. Quick review: LUMIX S Series are Full Frame L-Mount mirrorless hybrid video/still cameras with compelling cine capabilities. BGH1 is a Micro Four Thirds versatile cube-shaped camera conducive to remote, drone, multi-camera, stunts and car rig coverage.

If the details below are a bit of a slog, you may want to jump directly to the camera you have or crave.

Highlights of the free firmware updates include:

S1H: 5.9K and 4K Blackmagic RAW 12-bit Full Frame recording with Blackmagic Video Assist 12G HDR.

S1H: Anamorphic 3.5K 12-bit recording in Super35 format.

S1: 12-bit ProRes RAW recording with Atomos Ninja V. and additional video capabilities for S1.

BGH1: 12-bit ProRes RAW recording with Atomos Ninja V. (S1H and S5 already record ProRes RAW on Atomos Ninja V.)

Model	Firmware Version	Release Date
DC-S1H	Ver.2.4	March 31, 2021
DC-S1	Ver. 2.0	April 6, 2021
DC-S1R	Ver.1.8	April 6, 2021
DC-S5	Ver.2.2	April 6, 2021
DC-BGH1	Ver. 1.1, 2.0	March 24, 2021
(LUMIX Tether for Multicam)		

Download firmware updates from the Panasonic website: *tiny.cc/LUMIX-updates*

LUMIX S1H

S1H will now record Blackmagic RAW (up to 5.9K 5888 x 3312 30 fps 12-bit) via its full-size HDMI output to Blackmagic Video Assist 12G HDR. Be sure the Video Assist has the latest 3.4 update. This will let you edit, grade and finish S1H Blackmagic RAW footage directly in DaVinci Resolve.

S1H also records Apple ProRes RAW onto Atomos Ninja V for finishing in Apple Final Cut Pro, Adobe Premiere Pro and Avid.

Format	Resolution	fps	Aspect Ratio	Bit Depth
Full Frame 5.9K	5888×3312	29.97, 25, 23.98	16:9	12-bit
S35 4K	4128×2176	59.94, 50, 29.97, 25, 23.98	17:9	12-bit
S35 Anamorphic 3.5K	3536×2656	50, 29.97, 25, 23.98	4:3	12-bit

- V-Log or V709 is selectable on the monitor during RAW output.
- Wave Form Monitor, Vector Scope, Luminance Spot Meter, Zebra Pattern can be used during RAW output.
- Vertical Position video metadata to keep image vertical in playback.
- Power Save Mode selectable when using AC adaptor DMW-AC10.
- To Record RAW via HDMI Output, be sure to set the Menu to CINE > Image Format > HDI RAW Data Output > ON.

LUMIX S1

Atomos Ninja V

LUMIX S1

S1

The following updates are available with LUMIX Upgrade Software Key DMW-SFU2.

(If you already have DMW-SFU2, you do not need to purchase it again.)

S1 Updates include lots of resolutions and formats:

6K (5952×3968); 5.9K (5888×3312); 5.4K (5376×3584) .MOV

- 6K 24p, 4:2:0 10-bit LongGOP, 200Mbps, LPCM audio *
- 5.9K 30p/25p/24p, 4:2:0 10-bit LongGOP, 200Mbps, LPCM *
- 5.4K 30p/25p, 4:2:0 10-bit LongGOP, 200Mbps, LPCM *

C4K (4096×2160) .MOV

- C4K 60p/50p, 4:2:0 10-bit LongGOP, 200Mbps, LPCM **
- C4K 60p/50p, 4:2:0 8bit LongGOP, 150Mbps, LPCM **
- C4K 30p/25p/24p, 4:2:2 10-bit LongGOP, 150Mbps, LPCM

4K (3840×2160) 10-bit .MOV

- 4K 60p/50p, 4:2:0 10-bit LongGOP, 200Mbps, LPCM **

Anamorphic (3328×2496) .MOV

- 4K-A 50p, 4:2:0 10-bit LongGOP, 200Mbps, LPCM **
- 4K-A 50p, 4:2:0 8-bit LongGOP, 150Mbps, LPCM **
- 4K-A 30p/25p/24p, 4:2:2 10-bit LongGOP, 150Mbps, LPCM

*   *Maximum continuous recording time is 15 minutes.*
** *Maximum continuous recording time is 29 minutes 59 seconds.*

ProRes RAW for S1:

- RAW video output via HDMI
- 5.9K / 4K / Anamorphic (4:3) 3.5K 12-bit RAW

Format	Resolution	fps	Aspect Ratio	Bit Depth
Full Frame 5.9K	5888×3312	29.97, 25, 23.98	16:9	12-bit
S35 4K	4128×2176	59.94, 50, 29.97, 25, 23.98	17:9	12-bit
S35 Anamorphic 3.5K	3536×2656	50, 29.97, 25, 23.98	4:3	12-bit

- Apple ProRes RAW can be recorded on Atomos Ninja V

Available without the Upgrade Software Key DMW-SFU2:

- Dual Native ISO Setting.
- Vertical Position video metadata to keep image vertical in playback.
- Power Save Mode selectable when using AC adaptor DMW-AC10.

LUMIX S1R and S5

Updates:

- Vertical Position video metadata to keep image vertical in playback.
- Power Save Mode selectable when using AC adaptor DMW-AC10.

LUMIX BGH1

Atomos Ninja V

LUMIX BGH1

Download BGH1 Firmware update: *tiny.cc/LUMIX-updates*

New functions include:

RAW video output via HDMI to Atomos Ninja V:

Format	Resolution	fps	Aspect Ratio	Bit Depth
Micro Four Thirds 4K	4096×2160	59.94, 50, 29.97, 25, 23.98	17:9	12-bit
Micro Four Thirds Anamorphic 3.7K	3680×2760	59.94, 50, 29.97, 25, 23.98	4:3	12-bit

also:

- V-Log or Rec.709 selectable for Live View monitoring during RAW output.
- Shooting assist during RAW output includes Luminance, Spot Meter, Zebra Pattern.
- LUT for RAW video recorded on NINJA V to match with Panasonic Varicam, EVA1 and GH5 series cameras.
- Download LUT: *tiny.cc/BGH1-LUT*
- Genlock status display shown on external monitor connected with HDMI or SDI when the camera is Genlock synced.
- SD Card formatting via PC connection using camera menu on the live view display of LUMIX Tether.
- Vertical Position video metadata to keep image vertical in playback.

BGH1 Streaming:

BGH1 will get an IP streaming function for high-quality image transmission via wired LAN (Local Area Network – Ethernet cable). BGH1 can stream 4K 60p (50p) video in H.265–half the bit-rate with image quality similar to H.264.

BGH1 IP streaming with RTP/RTSP protocol:

- 4K/60p (3840×2160) H.265 50M, 25Mbps /H.264 50M, 25Mbps
- 4K/30p (3840×2160) H.265 25M, 12.5Mbps / H.264 25M, 12.5Mbps
- FHD/60p (1920×1080) H.265 20M, 16Mbps / H.264 16M, 8Mbps
- FHD/30p (1920×1080) H.265 12M, 6Mbps / H.264 6M, 3Mbps

BGH1 LUMIX Tether for Multicam:

LUMIX BGH1 is popular for multi-camera setups—for example shooting background plates, stunts, events, concerts, classes, etc.

- Settings and controls available for BGH1 during IP streaming.
- Record quality options for RAW video output will be displayed when [Menu]>[Video]>[Image Format]>[HDMI RAW Data Output] is turned ON.
- You can start/stop recording on external devices with the BGH1 when connected via HDMI/SDI output.
- When HDMI Recording Control and/or SDI Recording Control are ON, Record button is available even if the SD Card is not inserted in the camera. The HDMI or SDI connection is also displayed.

For settings and controls of the BGH1 via PC during IP streaming, LUMIX Tether for Multicam PC software should also be updated to Ver.1.1 or higher.

Download the LUMIX Tether for Multicam Software: *tiny.cc/Tether*

Panasonic LUMIX S Series Comparisons and Updates

As of April 6, 2021
Red text = available after firmware update. Green = with Software key DMW-SFU2. Blue = with firmware update and Software upgrade key DMW-SFU2.

S1   S5   BGH1   S1H

			S1H	**S1**	**S5**	**S1R**
Image Quality	**Sensor**		Full Frame 24.2MP with Low-pass Filter	Full Frame 24.2MP w/o Low-pass Filter	Full Frame 24.2MP w/o Low-pass Filter	**Full Frame 47.3MP w/o Low-pass Filter**
	ISO	**Dual Native ISO**	**AUTO / LOW / HIGH**	**AUTO / LOW / HIGH**	AUTO	-
		ISO Sensitivity	**100-51200 Extended 50-204800**	**100-51200 Extended 50-204800**	**100-51200 Extended 50-204800**	100-25600 Extended 50-51200
	I.S.	**Body I.S. Dual I.S.2**	**5-axis 6-stop*1 7-stop*2**	**5-axis 6-stop*1 7-stop*2**	5-axis 5-stop*3 6.5-stop*2	**5-axis 6-stop*1 7-stop*2**

Monitor	**LVF**	**5760k OLED, 0.78x**	**5760k OLED, 0.78x**	2360k OLED, 0.74x	**5760k OLED, 0.78x**
	Rear Monitor	**3.2" 2,330k, Tilt, Free-Angle, Touch Control**	**3.2" 2100k, Triaxial Tilt, Touch Control**	3.0" 1840k, Free Angle, Touch Control	**3.2" 2100k, Triaxial Tilt, Touch Control**
	Status LCD	**Yes**	**Yes**	—	**Yes**
Interface	**USB / Charge / Supply**	**USB3.1 TypeC (PD) / Yes / Yes**	**USB3.1 TypeC (PD) / Yes / Yes**	USB3.1 TypeC / Yes / Yes	**USB3.1 TypeC (PD) / Yes / Yes**
	HDMI	**TypeA**	**TypeA**	TypeD (micro)	**TypeA**
	Mic / Headphone / Remote	Φ3.5 / Φ3.5 / Φ2.5	Φ3.5 / Φ3.5 / Φ2.5	Φ3.5 / Φ3.5 / Φ2.5	Φ3.5 / Φ3.5 / Φ2.5
	Synchro Terminal	**Yes**	**Yes**	—	**Yes**
	Card Slot	**Double (SD UHS-II x 2)**	**Double (XQD/CFexpress x 1 , SD UHS-II x 1)**	Double (SD UHS-II x 1, SD UHS-I x 1)	**Double (XQD/CFexpress x 1 , SD UHS-II x 1)**
	Wi-Fi / Bluetooth	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes

	Log Recording	V-Log / 14+ Stops	V-Log / 14+ Stops	V-Log / 14+ Stops	—
	System Frequency	59.94Hz / 50.00Hz / 24.00Hz	NTSC / PAL	NTSC / PAL	NTSC / PAL
	Codec	MOV, MP4, AVCHD	MOV, MP4, AVCHD	MOV, MP4	MP4, AVCHD
	ALL-I	**Yes**	—	—	—
	6K Video Recording	**6K:24.00p/ 23.98p 5.9K:29.97p/ 25.00p/ 24.00p/ 23.98p** **5.4K:29.97p/ 25.00p**	**6K:23.98p 5.9K:29.97p/ 25.00p/ 23.98p** **5.4K:29.97p/ 25.00p**	—	—
	5K Video Recording	—	—	—	**29.97p/ 25.00p / 23.98p**

Panasonic LUMIX S Series Comparisons and Updates, cont'd

			S1H	S1	S5	S1R
Video	**4K Video**	**C4K**	59.94p/ 50.00p/ 29.97p/ 25.00p/ 24.00p/ 23.98p	59.94p/ 50.00p/ 29.97p/ 25.00p / 23.98p	59.94p/ 50.00p/ 29.97p/ 25.00p/ 23.98p	–
		4K	59.94p/ 50.00p/ 29.97p/ 25.00p/ 24.00p/ 23.98p	59.94p / 50.00p / 29.97p / 25.00p / 23.98p	59.94p / 50.00p / 29.97p / 25.00p / 23.98p	59.94p/50.00p/29.97p/ 25.00p/23.98p
	10-bit	**6K (4:2:0)**	24.00p/ 23.98p	23.98p	–	–
		5K (4:2:0)	–	–	–	29.97p/ 25.00p/ 23.98p
		C4K	59.94p(4:2:0)/ 50.00p(4:2:0)/ 29.97p/ 25.00p/ 24.00p/ 23.98p	59.94p(4:2:0)/ 50.00p(4:2:0)/ 29.97p/ 25.00p/ 23.98p	29.97p/ 25.00p/ 23.98p	–
		4K	59.94p(4:2:0)/ 50.00p(4:2:0)/ 29.97p/ 25.00p/ 24.00p/ 23.98p	59.94p(4:2:0)/ 50.00p(4:2:0)/ 29.97p/ 25.00p/ 23.98p	59.94p(4:2:0) / 50.00p(4:2:0) / 29.97p / 25.00p / 23.98p	–
		FHD	59.94p/ 50.00p/ 29.97p/ 25.00p/ 24.00p/ 23.98p	59.94p/ 50.00p/ 29.97p/ 25.00p	59.94p / 50.00p / 29.97p / 25.00p / 23.98p	–
		HDMI Output	Yes	Yes	Yes	Yes (4K 60p/50p 10bit)
	RAW Data Output	**Apple ProRes RAW**	5.9K(16:9) 29.97p/ 25.00p/ 23.98p 4K(17:9) 59.94p/ 50.00p/ 29.97p/ 25.00p/ 23.98p Anamorphic 3.5K(4:3) 50.00p/ 29.97p/ 25.00p/ 23.98p	5.9K(16:9) 29.97p/ 25.00p/ 23.98p 4K(17:9) 59.94p/ 50.00p/ 29.97p/ 25.00p/ 23.98p Anamorphic 3.5K(4:3) 50.00p/ 29.97p/ 25.00p/ 23.98p	5.9K(16:9) 29.97p/ 25.00p/ 23.98p 4K(17:9) 59.94p/ 50.00p/ 29.97p/ 25.00p/ 23.98p Anamorphic 3.5K(4:3) 50.00p/ 29.97p/ 25.00p/ 23.98p	–
		Blackmagic RAW	5.9K(16:9) 29.97p/ 25.00p/ 23.98p 4K(17:9) 59.94p/ 50.00p/ 29.97p/ 25.00p/ 23.98p Anamorphic 3.5K(4:3) 50.00p/ 29.97p/ 25.00p/ 23.98p	–	–	–
	Anamorphic (4:3)		50.00p / 48.00p / 29.97p / 25.00p / 24.00p / 23.98p	50.00p/ 29.97p/ 25.00p/ 23.98p	50.00p / 29.97p / 25.00p / 23.98p	–
	HFR (High Frame Rate)		48.00p / 120p[FHD] / 100p[FHD]	–	–	–
	VFR(Variable Frame Rate) / Slow & Quick		C4K/4K 2-60fps / Anamorphic 2-50fps/ FHD 2-180fps	4K 60fps / FHD 180fps	4K 1-60fps / FHD 1-180fps	4K 60fps / FHD 180fps
	Time Lapse		Yes (4K 60p in camera)	Yes (4K 30p in camera)	Yes (4K 60p in camera)	Yes (FHD60p in camera)
	HDR Video		Like2100 (HLG)	Like2100 (HLG)	Like2100 (HLG)	Like2100 (HLG)
	Time Code		Yes with TC Synchronization	Yes	Yes	–
	Recording Time Limitation		No Time Limitation	Common to 10-bit and 8-bit [15min] ·6K:23.98p ·5.9K:29.97p/ 25.00p/ 23.98p ·5.4K:29.97p/ 25.00p [29min59sec] ·C4K/4K/Anamorphic 4K: 59.94p/ 50.00p/ [No Time Limitation] C4K/4K/Anamorphic 4K 29.97p / 25.00p / 23.98p	[30 min] ·C4K/4K/Anamorphic 4K 10-bit 59.94p / 50.00p / 29.97p/ 25.00p/ 23.98p ·C4K/4K/Anamorphic 4K 8-bit 59.94p / 50.00p ·Slow &Quick [No Time Limitation] ·C4K/4K/Anamorphic 4K 8-bit 29.97p/ 25.00p/ 23.98p	[15min] ·4K [10min] ·High-speed
Dimension Weight (Body+Battery+SD Card)			151 x 114.2 x 110.4 mm 1,164g	148.9 x 110 x 96.7 mm 1,017g	132.6 x 97.1 x 81.9 mm 714g	148.9 x 110 x 96.7 mm 1,016g

The Business of the Business: Lensrentals

Drew Cicala, vice president and co-owner of Lensrentals.

Ryan Hill, video marketing specialist.

Drew Cicala is a co-owner of Lensrentals. His father Roger Cicala, MD started the company in 2006, mostly as a hobby. Drew was a senior in college then, and helped with the bookkeeping. He attended University of Michigan Law School and returned to join the family business when they had about 10 employees.

Ryan Hill is the video marketing strategist at Lensrentals. He has a professional video production background and is the person in the marketing department who focuses specifically on professional video.

Michel Suissa, Managing Director of The Studio B&H, arranged for this interview.

Jon Fauer: Drew, are you a photography fanatic like your dad?

Drew Cicala: I've always just been more interested in the business side. I think that helps keep us a bit objective. We've got owners who just want to play with gear and we've got owners who need to actually analyze that gear and say, okay, we can rent it and make a profit renting it. For example, Roger was making all those decisions on his own, he became very convinced that 3D video cameras were going to be the wave of the future because he wanted to play with one. It's a little bit better to have two different people involved in that to kind of keep things straight down the middle.

Let's get into the business of the business. Have the types of productions that you're servicing changed over the years?

Drew: It has changed a lot. We started as a photography rental company and expanded our video inventory as we grew. I pulled some numbers and haven't seen many trends that aren't extensions of other things that existed before. There's mirrorless. We also see a lot of high-end cinema. It's mainly the middle of the market that's disappearing. We see a lot of people who couldn't rent a high-end camera from a traditional brick and mortar rental shop because they didn't have the references or the ability to pay a deposit or get the insurance. With us, they can get access to more premium equipment through the online model. There's a democratization of the high-end equipment. And then on the other end,

there's a whole bunch of people who realize they don't need to use an ALEXA for every shoot anymore, and they can save themselves and their client some money. We had a strong 2020. Those are the macro trends we've seen.

What is your involvement with The Studio-B&H?

Drew: When my dad was buying stuff out of his garage, we were just another customer for B&H. They've worked with us over the years to help expand our business. As they could tell you, renting 500 different brands is not easy to do. Working with B&H lets us carry a lot more products, some in quantities of only one or two. B&H is a big part of our business.

Michel Suissa: I agree with Drew that what we call the middle segment or the prosumer market has somewhat vanished. It seems that there are two massive markets that are taking over. One is the high end; that's what we've seen at Lensrentals. We've seen the relationship with B&H grow in a way where there's been an upwards trend into the level of equipment that they've been purchasing from us. It goes for all the ARRI equipment that they own. We're very proud to say that came from us. On the lower end, and I don't intend to be dismissive because it isn't, but mirrorless for video has been extremely vibrant in the marketplace. Not just as a B or C camera, but also as an A camera. That transition from DSLR to mirrorless has been exponential because these cameras have greater access to lenses and the latest sensor technology. We've seen these two markets grow in our relationship with Lensrentals.

Drew, you said that some renters of high-end equipment will go to you when they can't get credit from a regular rental house. How do you address that?

Drew: Our business model started as an online-only, retail mindset. Most things were valued under $5,000 because it mostly photography equipment. As we've slowly ramped up our product lines over time, we developed different ways to verify people and make ourselves feel comfortable sending equipment to them. That's a little bit more unorthodox than asking, "What are your

credit references? Do you have a COI (Certificate of Insurance)?" Obviously, sometimes we do require all those things, but we have a little bit more flexibility to take the time and understand who you are and why you might need a piece of gear that maybe other rental houses just don't have the time to do. We've done it online for so many years that it is second nature to us to figure out whether a person is credit-worthy for renting gear.

I have an account with Lensrentals. Let's say I want to rent an ALEXA. Do I have to provide you with a COI?

Drew: It depends on the user, if you're an experienced user with us, no. We do require you to have insurance if you have a $50,000 camera, because we want to make sure that it's not going to be something you can't pay back if an accident happens. We will sell you either damage only, or damage and theft insurance as part of the checkout process, if you don't have your own. That's how we're able to get the surety that if you drop the camera, even if you don't have $20,000 on you, you'll be able to pay us for the repairs. We eliminate that little risk and just have to get to the point of trusting you to send it back to us.

If you provide the insurance, do people pay a premium for it?

Drew: Yes, it makes it a lot more streamlined. In the beginning, people got temporary policies which were fairly easy for them to get, but they're more expensive than what we offer. And then if something goes wrong, we have to deal with an insurance company that we're unfamiliar with. It saves us time and effort on our end to use our insurance broker rather than a different person for every single user who has a problem and an insurance claim. It really works on both sides.

Ryan Hill: It's also helpful in terms of access. People who might not be able to get a favorable insurance policy through a more traditional insurance company can just click a box on our website. It's great for people who wouldn't normally go through that sort of process, but I'd also say that it's a really helpful time-saver. For example, if you are shooting tomorrow, you don't have to bother with two separate companies. You just click a box on our website. It's one less hoop to have to jump through, especially if you have short notice.

I noticed you recently bought more ARRI ALEXA, Sony VENICE, RED RANGER MONSTRO, Canon C700 cameras and other high-end equipment. Can you talk about that?

Ryan: That segment of our rental market has been increasing. Our traditional market previously has been middle end—low to mid-budget indies, music videos, and documentaries. We've seen a big increase in the higher end things like ALEXA. I think that's a combination of our becoming a better-known name in that world. It's also a reflection of our having become a resource for other rental houses to whom we are sub-renting equipment.

Some lenses are rather expensive and a rental house may not want to invest. Nevertheless, DPs would like to try them. I suppose that's where you come in.

Ryan: Yes, we carry ARRI Signature Primes, Master Anamorphics, ZEISS Supremes, LEITZ Thalias, Angénieux Optimo Zooms. We've ordered a set of LEITZ Primes. We're getting more and more in that higher-end space.

Drew: We do a large number at this point, which I think makes sense for the high end. It's just so much easier to cover the whole country with one set of these lenses rather than just the LA market or the New York market. We don't have to worry about a lull in one region or because the weather's bad and then everyone cancels. It's the whole country. That really led to the sub-rent business. As demand goes from city to city, we fill in the gaps and help lower inventory carrying costs hopefully for some of these brick-and-mortar places.

Let's say I'm shooting a high-end commercial and rent from you. How does the crew check out the equipment?

Drew: We have a very thorough process on our end. It's tech driven. We invested heavily in the back-end systems of what we do here early on. We have a highly-trained team who check every piece of gear, every lens, every cable. Everything goes through a careful inspection process. There are four different groups involved before your equipment goes on its way out the door.

And I assume you're very good at replacing gear that breaks down in the field, which is often just one little cable.

Drew: Yes. We've added a lot of things to our process to try and eliminate that type of thing. Because if you have 14 different cables on your order and we test each cable individually, they all work fine sometimes. And then we put that cable from that monitor to that camera and it doesn't work. It works with 17 other copies of the same models. But for some reason it just doesn't work with that one. Especially for larger productions, we pre-build your entire orfer, make sure everything's working right before we put it in the cases. That way there isn't that chance of one bad cable interfering with your shoot.

Being in Memphis, you're also in a good position to send replacements very quickly from the FedEx Memphis SuperHub?

Drew: We can overnight replacements to anyone who needs it by the next morning.

How many people work at Lensrentals?

Drew: Probably 150 right now in Memphis. We also have a facility in Boston called LensProToGo. It's a smaller company with about 20 people there.

How do you handle "missing and damaged?" The equipment gets returned, one cable is missing or, gasp, a very expensive lens has the front element scratched.

Drew: We have an in-house repair department. Anybody who wants to sell us front elements, we'll replace those ourselves. We work with manufacturers as much as we can, and everyone works well with us on parts. We're able to get most things repaired in house, at fairly minimal expense to the customer, if it is customer damage. With shipping, sometimes is a little bit harder to tell sometimes how something broke. If it comes back to us and there's no external damage, but the lens doesn't work, we don't know, the customer could have dropped it on carpet. It could have rattled loose in shipping. It does happen. We end up with a lot of mysteries like that. We just tend to assume if something breaks that it was our fault and we fix it and put it right back into the inventory. We do have a few stories every now and then where it's a really difficult, expensive repair that no one saw coming. And those are never fun on either side.

What proportion of your rentals are going to features, documentaries, commercials, music, videos, corporate, TV, episodic, streaming, and so on.

Ryan: In our market, we've seen the most increase in equipment going to high-end feature films and documentaries. Documentaries have always been an important part of our business.

Do you see a downward trend in prices on the high end where it's becoming more democratized over the years?

Drew: Those manufacturers on the high end have done what they do for so long that their prices are not going to come down in price because I'm not sure they need to. But I think that the middle is shifting down to lower end prices. When you look at spec sheets and you're just looking at bullet points, the differences between these cameras and the lower end ones don't seem that much anymore.

Do you think that there will always be a high end for you?

Drew: I think so. For big productions from Hollywood, that's always going to exist. But I think for stuff below that it could get more difficult. Will an advertising agency really want to shoot on something that high end when they can save some money? Especially if they're already being asked to do a lot of things that involve smaller form factors where they couldn't use that as an A camera if they wanted to. I think it's more like "Why spend $15,000 if I can spend $7,000 twice and get two cameras. "That's some of what we see.

Michel: What used to be called high-end 10 years ago is now far more accessible to many more people. That's a big difference. You see people shooting with an ALEXA Mini or Mini LF now that you would not have seen shooting with ARRI 10 years ago. I think that's what the main difference is. And that gives a sense of democratization to the marketplace where Lensrentals is extremely well-placed. Lensrentals gives customers a sense of attainability

just as B&H does. There's an equalizing factor that is really good for all the content being created.

Your two companies seem to have a parallel philosophy. B&H has a massive inventory that you keep in stock and can ship immediately. The same thing is true at Lensrentals; you're able to get these cameras and lenses out to productions "just-in-time."

Drew: Having items like ARRI cameras and lenses available on the B&H website is helpful. You can immediately see the price; you can click, add it to your cart and you order it right there. Otherwise, you would have to call a number for a quote and the same thing on the rental end, that really has a big effect. If people see that it says to call, some may feel intimidated. I don't have to worry about calling somebody and hope that they think I'm legit enough to sell me this camera. That's a kind of new thing for the industry, especially at the high end, that didn't exist 10 years ago.

I think in macro too, that is part of the reason we've been able to weather all of the weirdness this past year. Our base of clients is a lot more diverse than a traditional rental house. If feature film production stops tomorrow, we don't lose our entire business. We have that low end and middle end, from hobbyists all the way up to professional features. It has helped us get through all this at least as well as we have.

What is the of ratio cinema productions using cameras under $10,000 to high-end films using $50,000+ cameras?

Drew: I can tell you that the only category that grew for us substantially last year was high-end cinema. For us, in dollar terms, we still probably do three times more in the low to middle range. We have a lot of mirrorless cameras that are easily going more than 50% to video usage.

That leads to the devil's advocate question. Let's say I'm an executive producer at Netflix. I have full control over everything that the production company rents. As you said before,

in commercials or lower end jobs, you could rent maybe four FX6 cameras for the cost of one ALEXA. If you were head of Netflix, would you also think that way?

Michel: I imagine for them that the cost of the equipment is such a low part of the overall expense that it doesn't really matter.

You're right. The difference in rentals may not even be the cost of their mobile phone bill.

Drew: Convenience matters and trust matters too. If you've got so many other expenses on the line, talent's too expensive to waste any time in rigging or making things fit.

Ryan: And that's where our subleasing comes in. There's a level of service and just being in the same town and having worked with DPs for years, where the brick-and-mortar rental houses provide that particular level of service that we're just never going to logistically be able to replicate. But if that brick-and-mortar rental house needs to rent four VENICE cameras but they only have three, that's where we come in.

I saw your recent survey where you showed the RF Mount is gaining. If you factored in all of the mirrorless mounts—RF, E, and L-mount, how does that compare to the PL and LPL lens mount world for cinema?

Drew: We do about equal amounts of E and PL cine lenses rentals. And we do substantially more EF at this point than either one of those simply because we have lots of people who use ZEISS CP.2 lenses and other entry-level cinema primes for DSLR or mirrorless shooting. But PL is where the growth really is. Probably just because we are getting more into the high end and so a higher percentage of high-end lenses are PL than other things. But PL and LPL are always going to be here just like ARRI is.

Michel: Jon, since you like stats, I'm going to give you stats right here. In terms of mount popularity based on the amount of glass that's available on the market, we offer a variety of 649 PL lenses at any given time. And we currently offer only 21 RF native lenses. I think that's an indicator of the diversity of optics that you can find for one specific mount.

What about E-mount?

Michel: There are 272 different models of E-mount lenses offered on the B&H site at any given time. This includes lenses with interchangeable mounts like ZEISS CP.3 and what's generally called the cinema section of our inventory.

Next statistic question: in cinema, do you have a reading on the percentage of Full Frame to Super35?

Ryan: This is broad, but I would guess at this point it's probably like 60:40, super35 being 60%, and full-frame being 40%. You have to consider our market is a little bit different than the industry as a whole, and things like the R5, 5D and A7 full frame mirrorless cameras are more popular in our inventory than it would be in a traditional brick-and-mortar rental house. If we're only talking high-end cinema, I think our full frame has not quite caught up to our Super35 inventory.

If we're to look in our crystal balls, where do you see the business taking us? Your business and the business in general, for high-end, low-end, stills and video.

Drew: That's something we kick around a lot internally at the moment, just because coming out of the pandemic and trying to imagine what the world's like on the other side of it, it's pretty uncertain. I think some of these trends, as far as live streaming and doing things remotely are here to stay. But I think there could be a little bit of a comeback in the semi-professional part of the industry, especially on the photography side.

When I first got in here, it was during the last recession. I think there's something to be said for people getting furloughed in a tough economic time and then putting out their shingle and trying to do something creative, do a self-business for a year or two. We saw a lot of that in 2009 and 2011 with people who might as well try and turn their hobby into a profession. If we have another round of that, it could be kind of a boom at the lower end of the market, but there's just so much uncertainty. It's really hard to tell. For us, our business has come back to just about normal the last few months. But it is impossible to tell whether that's just the backlog of productions from when things went completely shut down in the spring or things really are back to normal. I suspect there'll be kind of up and down here for the next year or so, but after that, remote seems likely, everything being remote, and mirrorless DSLRs will continue to struggle on the photo side.

Ryan: In terms of our high-end production, this is a broad prediction, but I think given the increase in streaming services and what seems to be a decrease in mid-budget theatrical releases, $200 million movies are going to continue to exist in the same way that they existed up to now. I think $3 million movies are going to continue to exist in the same way that they existed. What I think is going to be affected most is what we've already seen affected are those mid budgets, $30-$50 million movies. They aren't necessarily going to be made by the same people who made them in the past. They get made at a lower budget. And maybe that is where we can pick up some rental business. I think our high end is going to be like the industry as a whole's middle end, if that makes sense.

Michel: My crystal ball is a little brighter. I predict a resurgence of production for several reasons. Number one, there's been a strong desire in the community to get back to work. And number two, that is driven by the need for consumption. And the longer we keep watching content on small, medium and large screens, I think that's going to drive production up substantially. I really believe that's what 2021 is going to show us. We know for a fact that remote production is here to stay. There's also an upward trend of the level of quality that's being produced. I think that's really good for us as well as for Lensrentals. I think people want to go back to creating quality. I predict more productions, higher quality, not necessarily high budget because of the new ways of working. But I think we're going to see 2021 is going to be a rebound year in that regard.

Drew: It's been a quite a journey. I didn't expect to be here at Lensrentals this long. When you join a family business that's three years old, right after seven years of higher education and a law degree, you don't expect that to be a career, but it really has been. It's just been great fun from the beginning, from it being a small company to learning how to do things at this scale, it's always new. It's always challenging.

www.fdtimes.com

On Paper, Online, and now on iPad

Subscribe
Online:

www.fdtimes.com/subscribe

Call, Mail or Fax:

Direct Phone:	1-570-567-1224
Toll-Free (USA):	1-800-796-7431
Fax:	1-724-510-0172

Film and Digital Times Subscriptions
PO Box 922
Williamsport, PA 17703
USA

- ☐ 1 Year Print and Digital, USA   6 issues $ 49.95
- ☐ 1 Year Print and Digital, Canada   6 issues $ 59.95
- ☐ 1 Year Print and Digital, Worldwide 6 issues $ 69.95
- ☐ 1 Year Digital (PDF) $ 29.95

- ☐ 1 year iPad/iPhone App upgrade   + $ 9.99
     (normally 29.99) *Get FDTimes on Apple*
     Newsstand with iPad App when you order
     a Print or Digital Subscription (above)

Total $ _____

Payment Method (please check one):

☐ VISA   ☐ Mastercard   ☐ American Express

☐ Check Enclosed (payable to Film and Digital Times)

Credit Card # _____

3 or 4 digit security code_____

Expiration Date_____

Signature _____

Name _____

Company _____

Title_____

Address _____

City _____

State or Province _____

Country _____

Zip or Postal Code_____

Phone _____

Fax_____

Email_____

Sponsors and Educational Partners

Titans of the Industry

arri.com
blackmagicdesign.com
canonusa.com
creativesolutions.io
us.leica-camera.com
sony.com/professional
tiffen.com

Moguls

abelcine.com
aja.com
Angénieux.com
bandpro.com
cookeoptics.com
cvp.com
fujifilm.com
leitz-cine.com
panasonic.com
prestoncinema.com
red.com
sigma-global.com
teradek.com
zeiss.com/cine
zgc.com

Executive Producers

atomos.com
dji.com
emit.fr
lowel.com
litepanels.com
ocon.com
servicevision.es
smallhd.com
woodencamera.com

Producers

antonbauer.com
cartoni.com
cinemaelec.com
ibe-optics.com
ottonemenz.com
photocineshop.com
C&L Studio: camarasyluces.com
transvideo.eu

Co-Producers

aatondigital.com
BandH.com
chrosziel.com
manfrotto.us
mole.com
msegrip.com
orcabags.com
pstechnik.de
sachtler.com
steadicam.com

Associate Producers

16x9inc.com
brighttangerine.com
chengseng.com
chrosziel.com
cinetech.it
cmotion.eu
dmglumiere.com
denz-deniz.com
easyfocus.at
easyrig.se
filmtools.com
hd-systems.biz
idxtek.com
inovativ.com
jlfisher.com
kinoflo.com
loumasystems.biz
mytworks.com
musashi-opt.co.jp
nanliteus.com
pat-acc.com
raid-japan.com
ronfordbaker.co.uk
rosco.com
sekonic.com
shapewlb.com
vocas.com
whitepointoptics.com

Rental Houses

abelcine.com
arri-rental.com
bertonevisuals.com
camalot.com
camarasyluces.com
cinediving.com
www.hd-systems.biz
jpfcine.cl
keslowcamera.com
kofilmrental.com
koernercamera.com
lemac.com.au
lites.be
ljud-bildmedia.se
musitelli.com
nacinc.com
panalight.it
photocinerent.com
rawcamera.com
rvz.fr
sanwa-group.com
servicevision.es
storyline.no

Media Partners

afcinema.com
airstar-light.us/film
bscexpo.com
camerimage.com
cinec.de
cinegearexpo.com
fsfsweden.se
ibc.org
icgmagazine.com
imago.org
inter-bee.com
nabshow.com
soc.org

Sponsors and Educational Partners

Associate Producers

SHAPE

Vocas

BRIGHT TANGERINE

Ronford-Baker
CAMERA SUPPORT TECHNOLOGY

louma systems

Easyrig

INOVATIV

Cinetech

J.L.Fisher

Chrosziel
...the cinematographer's choice

MUSASHI-OPT

Filmtools

PRÄZISIONS-ENTWICKLUNG
pedenz
DENZ

CS
CHENG SENG GROUP
IMAGE SOLUTION
PHOTO VIDEO AUDIO CINE

KINO FLO
Lighting Systems

16X9 INC.

ROSCO

DMG LUMIÈRE
BY ROSCO

cmotion

MYT WORKS
BORN OUT OF FRUSTRATION

Prêt à Tourner
accessories

RAID

NANLITE

SEKONIC

I·D·X
Connecting Innovation & Dependability

Rental Houses

CAMALOT
AUDIOVISUAL FACILITIES

RVZ LOCATION

C&L RENTAL

CAMERAS BY
OTTO NEMENZ

SERVICE VISION

KESLOW CAMERA

RAW

K FILM RENTAL

HD systems
camera rental

Storyline

LITES
CINE DIVING
UNDERWATER FILMING

nac
IMAGE TECHNOLOGY

LEMAC

BERTONE VISUALS

PHOTO CINE RENT

ARRI Rental

KOERNER
CAMERA SYSTEMS

MUSITELLI

AbelCine

sanwa
CINE EQUIPMENT
sanwa
PRO LIGHT

Panalight

JPF CINE EQUIPMENT RENTAL
SANTIAGO - CHILE

LJUD & BILD MEDIA AB
LIGHT & GRIP RENTAL
PRO AUDIO. VIDEO. WWW.LJUD-BILDMEDIA.SE

Media and Production Partners

cinec

AFC
Micro Salon Show

CineLenses

fsf THE FSF DAYs

NABSHOW

BSC expo

cine gear EXPO
ENTERTAINMENT+DIGITAL

IMAGO
EUROPEAN FEDERATION OF CINEMATOGRAPHERS
For the art of Cinematography

CAMERIMAGE

ICG

SOCIETY OF CAMERA OPERATORS

Inter BEE
International Broadcast Equipment Exhibition

airstar

ibc

Titans of the Industry

SONY

Blackmagicdesign

ARRI

Canon

Leica

TiFFEN

CREATIVE SOLUTIONS

Moguls

Cooke

CVP

Leitz

ZEISS

RED

FUJINON

AJA VIDEO SYSTEMS

angénieux

TERADEK

FUJIFILM

Panasonic

PRESTON CINEMA SYSTEMS

AbelCine

Cooke AMERICAS

SIGMA

bandpro FILM & DIGITAL INC.

Executive Producers

SERVICE VISION

ATOMOS

lowel

WOODEN CAMERA

SMALLHD

DJI PRO

Litepanels

Emit

oconnor

STEADICAM

Producers

C&L RENTAL

CINEMATOGRAPHY electronics

Tokina VISTA BEYOND FULL FRAME

TILTA

PHOTO CINE SHOP.com

ANTON BAUER

CARTONI PROFESSIONAL CAMERA SUPPORT

CAMERAS BY OTTO NEMENZ

transvideo

IBE OPTICS

Co-Producers

TERADEK RT

AATON DIGITAL

ORCA

P+S P+S TECHNIK

THE STUDIO B&H

sachtler

Manfrotto Imagine More

Mole-Richardson Co.

matthews studio equipment

Associate Producers, Rental Houses, Media and Production Partners on previous page