Yoshihisa Toda, JSC *on The 13 Lords of the Shogun*

FILM AND DIGITAL TIMES

Art, Technique and Technology

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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.

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The 13 Lords of the Shogun

Yoshihisa Toda, JSC in Asagiri Highlands, near Mt. Fuji, with Sony VENICE camera and ZEISS Supreme Primes on *The 13 Lords of the Shogun*.

Film and Digital Times exclusive. Written by Masako Misaki (FDTJ). Photos by Arato Ogura (FDTJ).

Established in 1950, NHK is the oldest and largest content subscription service, television and broadcast network in Japan. As a public broadcast corporation, NHK charges each household a monthly or annual television viewing fee. Terrestrial (cable or over-air) is US $9.45; satellite is US $16.50 per month. In 2021, NHK's annual turnover exceeded 54 billion dollars.

NHK's programming includes live news, documentaries and dramas. The *Taiga* (translated as *Big River*) drama series is considered the most prestigious and highly anticipated series. Each year, NHK chooses historical themes, in most cases based on original screenplays, and breaks down the story into approximately 50 episodes that air for a full year, from January to December. Each episode is 45 minutes, airing every Sunday evening. *The 13 Lords of the Shogun* is NHK's 61st *Taiga* drama series. It started airing in January 2022 and will finish in December.

The 13 Lords of the Shogun is a story from 12th century Japan. The charismatic leader Minamoto no Yoritomo established the Kamakura Shogunate, shifting the political power-base from Kyoto to the east. Behind this military feat were thirteen vassals. But, after the shogun's death, a fierce power struggle erupted. Out of the thirteen, Yoshitoki Hojo emerged on top, the youngest of them all.

This drama illustrates Hojo's career and private life, showing how this young samurai, who started with no such ambitions, became the greatest warrior in the country. While the *Taiga* dramas have been extremely popular nationwide, NHK recognized in recent

years that the viewership has been changing and the competition is coming not only from regular commercial broadcasters but also from OTT streaming services.

NHK's Takuya Shimizu, General Producer at NHK Drama Unit, explained, "NHK can't relax on past successes, but rather should cater to current viewers' interests and gain more young subscribers. Therefore we are encouraged to create content that can be considered on par with the competition. That is the reason why we use large format cinema cameras and lenses, and applied dynamic color grading, to create the cinematic look that viewers are used to watching on OTT services today.

"Every *Taiga* drama series spotlights a person in history, portrays how that person contributed to the country and how the history has evolved. To convey such grand stories, we put a lot of effort into casting, set design and costumes. Above all, the image quality also has to be world class. Previous *Taiga* dramas were shot with four broadcast cameras and B4 mount zoom lenses in the shortest amount of time.

"But, with drama series since 2020, we have been using 3 cinema cameras and Full Frame prime lenses. It was indeed a challenge for us to continue this rather labor-intensive style for a full year, but with NHK production engineers' streamlined shooting and post workflow, and the directors' efforts to use long Master Shots and minimize excessive coverage, we are able to realize cinematic images that cinematographer Yoshihisa Toda, JSC intended without sacrificing production efficiency. This drama has been an arena for us to try new technology and methods, and to eventually elevate NHK's entire technical level."

Teruyuki Yoshida, Executive Director of *The 13 Lords of the*

The 13 Lords of the Shogun

Shogun explained the reason why Yoshihisa Toda, JSC was selected as Director of Photography to work on this year-long drama at NHK: "While we have an internal camera department at NHK, I opted to bring someone from outside to stimulate creative collaboration. I knew Toda for years, liked his unique color palette and lighting design, and expected him to lead us to new directions for our traditional NHK drama series."

Toda learned filmmaking in college. He spent 20 years working his way up with many international credits, including an Academy Award nomination for Best Foreign Language Film representing Japan, Berlin International Film Festival Silver Bear, Montreal International Film Festival Grand Prix, Porto

L-R: Teruyuki Yoshida (Executive Director, NHK drama unit), Yoshihisa Toda JSC, Takuya Shimizu (General Producer of *The 13 Lords of the Shogun*)

International Film Festival Best Picture Award, and the list goes on. Toda said, "It was a challenge for me to take a job this lengthy—17 months—requiring comprehensive study and an understanding of Japanese history, but I enjoy working with this big team and fascinating story.

"When we learn Japanese history, the Shogun is always pictured as if lit by spotlights. History is usually written by the winners, but on this drama I am trying to illustrate not only the Shogun but also his staff and even enemies as I imagined they would have lived their lives and fought for their principles. For this purpose, I am often using tighter compositions to capture subtle expressions—usually with an 85mm prime lens or longer, and frequently with a 135mm prime."

This drama is captured with 3 sets of Sony VENICE cameras and ZEISS Supreme Prime lenses. It is a Full Frame (Large Format) 4K production. And, because the series is broadcast in 4K, the Super 35 mode on VENICE still provides enough resolution so Toda can switch from Full Frame (6K) to Super35 (4K) when he needs to quickly frame a tighter composition.

Toda added, "Past NHK dramas were often shot on ⅔" sensor cameras with lenses set to their hyperfocal distances—so everything was in focus. But with today's Full Frame sensor cameras, we have full control over focus and depth of field, and can navigate the viewers' attention where we want to create emphasis. As with shooting feature films, selective focus and wide lens apertures become major components of story-telling, helping to capture subtle emotions. Furthermore, the COVID-19 pandemic has actually increased the number of viewers streaming overseas dramas shot on Large Format cameras, so it

Front row, L-R: Akira Murata (Camera Operator), Kazuya Yamagata (Camera Operator), Marusuke Kishi (Focus Puller);
Rear row, L-R: Shinsuke Kurata (Focus Puller), Yoshihisa Toda JSC (Director of Photography),
Masafumi Taniguchi (Focus Puller), Sakae Umeda (2nd AC), Toru Shimamura (Focus Puller).

was good timing to push large format filming and experimenting with fresh color palettes at NHK."

Cavalry battles and epic sword fights are key ingredients for any Japanese historical drama, and this series is no exception. The battlefield scenes were filmed in multiple outdoor locations, notably at Asagiri Highlands in the foothills of Mt. Fuji.

Toda designed the shot lists with a variety of camera positions, from high crane setups to infantry soldiers' POVs. Under the summer sun, the location was very bright and extremely hot. Toda benefitted from using VENICE's internal ND filters to expose between T2.8 to T4, effectively guiding the viewers' attention to where important fight choreography was happening in the frame.

"I seldom use heavy diffusion," Toda said. "I prefer to keep the pristine crisp look of the Supreme Prime lenses. There were times when the Director asked for gritty or diffused looks, but I'd rather not bake in any strong visual characteristics with filters in front of the lens. Instead, I prefer the flexibility of applying diffusion effects afterwards in post if they are really needed."

One interesting fact about NHK drama is that while the camera and lens setups are consistent throughout the year, the recording methods differ depending on whether they originated on location or in a studio. All outdoor location scenes and non-NHK studio shots are recorded onto memory cards—as is usual on most film productions. But inside the NHK studio, things are different. At NHK studios, video and audio feeds connect directly to control rooms. All images and audio signals are managed and tweaked in these control rooms and then recorded on centralized servers. NHK's VENICE cameras are equipped with SDI output converters, like their newsroom cameras, and wires are connected to wall outlets that send images to the control room. Recording start and stop is activated in the control room as well, so the REC buttons on the cameras never turn red — because the footage is not recorded in-camera.

As of September, the drama has 3 months to go until the finale. The script is tweaked on a weekly basis to optimize the viewers' experiences. Takuya Shimizu said, "In today's world, we are aware that viewers' disposable time is limited, and all content platforms are competing. When I look at the program schedules of the competition, I realize that they cover very wide topics and themes that NHK has been doing as a public broadcast station. As the largest content provider in Japan, NHK continues to produce big budget, grand historical dramas while not neglecting niche audiences with experimental, avant-garde or provocative content. It is our mission to create various kinds of content at a high level."

Yoshihisa Toda, JSC running through rehearsals on location, above; and in the studio, below.

The 13 Lords of the Shogun framegrabs

EXT. ON LOCATION - DAY. 135mm ZEISS Supreme Prime at T4. Tiffen Black Satin Filter. Sony VENICE at 4800K.

EXT. ON LOCATION - NIGHT. ZEISS Supreme 65mm at T2.8. Tiffen Black Satin Filter. VENICE at 3200K. 4K HMIs bounced into Polyboards as the ambient light. Torches as practical lights augmented by Tungsten fixtures with Softboxes for the actors.

INT. STUDIO - NIGHT. 100mm ZEISS Supreme at T2.8, Black Satin Filter, VENICE at 4000K. ARRI S60-C SkyPanels with Softboxes as ambient light; S60-C bounced into muslin for the actor, Astera Titan and Helios Tubes for fill light.

INT. STUDIO - DAY. ZEISS Supreme 85mm at T2.8, Black Satin Filter, VENICE at 4000K. S60-C Skypanels with Softboxes for the exterior, S60-C with diffusion for the main actor, Titan and Helios Tubes for fill light. Rosco Vapor Fog Machine.

VENICE Camera festooned with accessories.

ZEISS Supreme Primes and Tiffen Black Satin Filters in a compact case.

Akira Murata, Operator (Left) and Marusuke Kishi, Focus Puller (right).

Masafumi Taniguchi pulling focus with a wireless ARRI HU-4.

Yoshihisa Toda JSC planning a tracking shot.

Yoshihisa Toda, JSC lining up on the Samurai.

Akira Murata (left) and Marusuke Kishi (right).

Shinsuke Kurata (left) and Kazuya Yamagata (right).

The 13 Lords of the Shogun in the studio

Checking lights inside NHK Shibuya Studio.

Yoshihisa Toda, JSC in the studio.

Art department tweaking cherry blossoms: key to illustrating the season.

Yoshihisa Toda JSC handheld during a rehearsal.
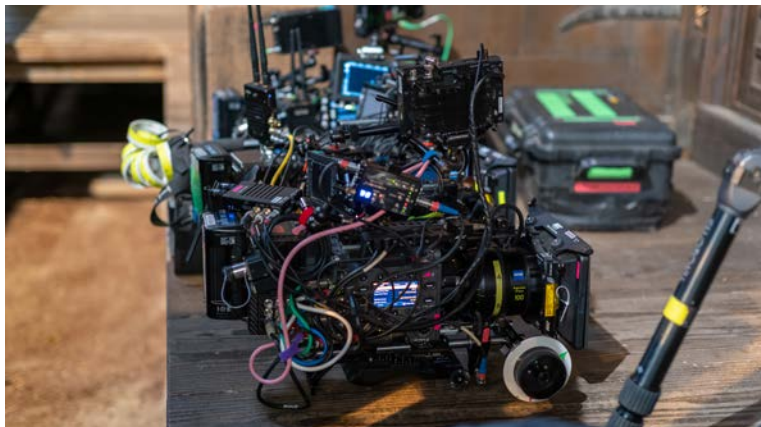
3 Sony VENICE Cameras ready to go.

Sony VENICE Camera in full studio setup.

Proprietary SDI converter with green cable connects to control room.

NHK Studio control room.

Framegrab above: Taken with ZEISS Supreme 50mm at T2.8, Black Satin Filter, S60-C SkyPanels with softboxes for the exterior, S60-C bounced into muslin for the actors. Titan and Helios Tubes as fill light. Below: Cinematographer Yoshihisa Toda JSC at camera in the studio.

Film and Delicious Times: *Sawayaka*

A hamburger steak plate ready to be served.

Sizzle, smoke and splatter resistance.

No FDTimes story should end without a celebration of local food. The *13 Lords of the Shogun* location scenes were filmed at the foot of Mt. Fuji, and there is a restaurant in the region that every production crew member was talking about: *Sawayaka*.

The specialty of the house is a char-grilled, 100% beef, 250g fist-sized hamburger steak. Your waiter or waitress oversees the entire operation, first asking you to pull up the paper place mat to cover your clothes. Then the ball-shaped steak is served at the table on a burning-hot iron plate straight from the grill. The show begins: the staff solemnly slices the steak in half, pushing the cross sections against the iron plate to perform the grand finale. The patty sizzles loudly, spattering the juice all over the place. Good you pulled up your protective place mat. The irresistible scent doubles your appetite; it is a feast for the five senses.

Sawayaka, the name of the char-grill restaurant, means something refreshing or pleasant. It is probably the most wanted-to-visit hamburger steak house in Japan today. The first restaurant opened in 1976. Now there are 34 restaurants—all in Shizuoka prefecture. None are outside Shizuoka; there is no delivery service or takeout or online shop. *Sawayaka's* fame was hidden within the region for the first 30 years of their business. Then social networking took over the county and now everyone wants to come here to post photos of sizzling patties.

But the good food is not the only thing that attracts people to *Sawayaka*. According to Kazuto Watanabe, restaurant manager of Sawayaka Fuji Nishiki Branch, they are not a restaurant to merely sell steaks and then end the relation with customers when they finish eating. Instead, their aim is to deliver the customers a "homey experience" through the food they serve and the interaction with the staff. So *Sawayaka* utilizes technology to make the floor staff available as much as possible for the customers at their tables. They were early adopters to introduce a smartphone-based waitlist system with a website that tells you the waiting time at each restaurant in real-time.

Sawayaka restaurants take pride in not having meat freezers at their locations. All hamburger patties are prepared at their central kitchen (FSSC22000 and HACCP - Hazard Analysis Critical Control Point Certification compliant) and delivered every day to each restaurant. Everything is fresh, including the vegetables, salads and produce. They contract with local farmers for seasonal ingredients. As a result, the menu selections change according to what is available from the farms.

As has been said, "People shall not live by bread alone." They shall be served juicy hamburger steaks to nourish the body, and a cozy experience to revitalize the spirit.
genkotsu-hb.com/shop/

Cooking Sawayaka's famous steaks on the charcoal grill.

Sawayaka Fuji Nishiki Branch staff pose before lunchtime onslaught.

Darius Khondji, ASC, AFC: Angénieux Cinematography Tribute at Cannes

Hommage Pierre Angénieux 2022 à Darius Khondji, ASC, AFC. Photo by Pauline Maillet.

Angénieux hosts the Pierre Angénieux Tribute every year at the Cannes Film Festival to celebrate an exceptional cinematographer's career. Darius Khondji ASC, AFC was awarded the ninth Pierre Angénieux Cinematography Tribute this year at Cannes on May 27, 2022.

Previously, Darius appeared on the cover of the Film and Digital Times February 2012 edition and in an interview about Midnight in Paris; *in a February 2013 article about Philippe Parreno's* Marilyn; *an ALEXA 65 article in June 2017; and an article by Chris Silano and Olga Abramson about focusing for Darius on* Uncut Gems *in July 2020.*

Jon: Do you want to turn on your Zoom video? Don't worry, this will appear as a text interview, no pictures.

Darius: I never like pictures or video of me on anything. I decline it all the time. I just don't like pictures of myself.

The last time we spoke, you were doing a short film with your son Alexandre. Even then, you also said you didn't want any pictures of yourself; nevertheless, you graciously sent me a whole bunch of production stills and they were all excellent. What is Alexandre doing now?

Alexandre is a young artist. He graduated from Bard College in New York, got a Masters at the Royal College of Art in London and completed a residency at the Fondation Luma, Arles, in the south of France. He did an art installation there and it's really

interesting. He's doing really well.

Speaking of young artists, how did you get started in film?

I was born in Iran, of an Iranian father and a French mother. I was brought up in France. All my culture, everything I have, is from France. I'm more like a French person but I love the idea of having my Persian side. I love the Iranian people and Persian art, culture, cinema—and the food is incredible.

I grew up in a suburb of Paris, near Versailles, in a little town called Vaucresson. We lived in a very interesting, big old house with a garden. I went to primary school and high school nearby.

I care very much about France. It is where I grew up and lived almost my entire life. It is where I was educated.

I was really brought up by my mother and sister. It was my sister Christine who gave me my cultural education. She took me to art galleries and museums. I owe her a lot. We traveled to Northern Italy, England, and around France. I started watching films. I went to the Cinémathèque Française, the French Cinematheque, very early on and became a cinephile.

After I graduated from high school and did one year of university in France, I went to NYU film school in New York. It became, in a way, my adopted second country. New York was an incredible influence artistically and emotionally. I'm very grateful to New York. I was 22 years old when I arrived and I

Darius Khondji, ASC, AFC at Cannes

Darius Khondji, ASC, AFC. Photo by Peter Lindbergh.

discovered the New York of the late '70s, from 1977 to 1980. It was an incredible moment to be there. This was a second period of my life. I think it influenced almost everything for me. I had a wonderful teacher, Haig Manoogian, when I arrived at NYU. He was a very important person for me.

Emotionally, I feel very close to America. I work a lot in the United States and it's like my second country. It's not only my work, it's an emotional side of me. I should become a citizen because I feel so involved with the USA. But I'm citizen of France. I vote there.

How did you choose NYU?

I attended university in Paris to study history and languages. I was accepted at NYU as a second-year student. It was very expensive but my father had just passed away and he left us some money, so I put that towards my film studies, my passion. I was not an especially good student but they accepted me nevertheless.

And after NYU?

When I returned to France from NYU, I started to work. I did an internship at a Panavision Company rental house called Samuelson Alga, on the outskirts of Paris in Vincennes. At the same time, I did an internship for a few months at the Laboratoires Éclair, learning all about film processing and printing.

Then I started as a second camera assistant, a clapper/loader. I learned all the crafts of the camera department. France had a very technical way with that. You would shoot a lot of tests, have it processed and then examine the negative under a microscope. It was good but difficult for me because I was not a very technical person; but I had to adapt to this. Then, I was very lucky to meet one of the best first camera assistants, Pascal Marti, who became a very talented cinematographer himself. He recently won a César Award, the national film award of France, for cinematography.

At the time, Pascal was first assistant to Bruno Nuytten, AFC (*Jean de Florette, Manon des Sources*). Bruno Nuytten is a legendary French cinematographer. We worked together on a big movie called *Fort Saganne* with Gérard Depardieu, Catherine Deneuve and Sophie Marceau. It was one of the most expensive

films at the time. Bruno wanted to work with equipment from Technovision, a company located in Rome and England. I went with part of the camera team to Rome for three weeks to prepare three Arriflex 35BL cameras with anamorphic lenses. We had to test and select all the lenses: Cooke and ZEISS Technovision anamorphic conversions and Kowa anamorphics. We went through 30 to 50 lenses to select the best ones for each of the three cameras. That was in 1983. The basic thing for Bruno was to have as many Cooke lenses as he could because he liked the original spherical Cooke Panchro lenses and Technovision anamorphosed as many of those as they could.

We also had two Cooke 25-250 zooms which became 50-500 with a rear anamorphic adapter, and a 20-100 which became a 40-200. So, we had a lot of equipment to prepare.

Is that when you first met Henryk Chroscicki? I remember you were good friends.

Yes, that is when I met the owner of Technovision, Henryk Chroscicki. He was very nice to me, very generous. He helped me a lot and took me around. We became friends right away. We shared similar ideas and it was just a wonderful time of preparation in Italy.

How did you get your big first break as a cinematographer?

I did short films as a cinematographer. I got my first break by showing my short films to the Director of a science fiction movie. It was an anamorphic, black and white film called *Le trésor des îles chiennes (Treasure of the Bitch Islands)*. I was working on a commercial at the time and I went to see Henryk. I handed him the script and said, "Henryk, it's a very low budget film but I would love to do it. I was hoping that you can help us as much as you can with this movie that I really believe in." He took me seriously, and helped me, the producer and François-Jacques Ossang, the Director. Henryk made it happen. He was amazing. In addition to running rental houses in Rome and London, Henryk was also a film producer. This film was partly produced by him because he gave us the equipment and all the support. We shot the film in 1989.

That was the second step of revelations for me as a very young cinematographer. I realized how much pleasure I had photographing a film for Director, and telling a story with the camera, with lenses and lights. It was a very important thing that Henryk did for me. After that, I only wanted to work with him at Technovision. We developed a working relationship because he was always interested in getting us what we needed and finding new ways of tweaking the lenses.

He was a real genius. I also remember Marcello, one of the main technicians, and Beppe who was the head of the camera department. Marcello was an amazing maestro with lenses. In Italy at the time, in the 80s and 90s, he was a bit like Dan Sasaki of Panavision today.

Would you say you're pretty technical because of all your training as an AC and involvement with Technovision?

No. I'm not technical.

After all these years, still not?

Well, it's an ambiguous thing because I always consider myself

Darius Khondji, ASC, AFC at Cannes

James Gray and Darius Khondji on *The Immigrant.* Photo: Anne Joyce.

non-technical, but at the same time, I am technical with the aspects of filming. If I get a new script, I read and study it; then I start shooting tests to learn things about the film. In that way, you could say I'm technical. But I'm not fascinated by the technique. I'm always fascinated and excited by what other cinematographers do technically, but it's not the most important thing for me.

When you get a script or storyboard, how do you decide on the style of the film and choose the cameras, lenses, lights and other equipment?

From the idea, from what I tell myself about the story, from what the Director tells me. It comes from the feeling of what would be right for the film, how I want to photograph it, followed by some references and ideas. Then the mood of the film starts to take shape after further discussions with the Director. After that, the technical things happen. Maybe we need a big sensor camera, or a small sensor, or we need to shoot it on film negative. If we shoot on film, what do we want to do with it, push the negative, or pull it? If we shoot on digital, how do we handle it? What lenses should we choose—spherical, anamorphic, Cooke, Canon, Nikon, Panavision, or Angénieux?

Hopefully you choose Angénieux from time to time :) What lenses have you used on recent movies, for example?

I used Panavision Sphero 65, Baltars, Blackwing7, Angénieux Optimo Anamorphic, and Angénieux Optimo Spherical zooms. On features, I mostly use prime lenses, augmented with zooms. On all commercials and music videos, I always have the Angénieux Optimo zoom lenses: wide, medium and long. I use the three zooms a lot.

On movies, even if I'm shooting Panavision, we have Angénieux zooms. I remember, in the beginning before Angénieux made dedicated anamorphic zooms, we added rear cylinders to their existing lenses. That was quite a few years ago when a lot of lens technicians said it was not possible, but we ended up doing it.

What is the reason for using zooms almost exclusively on commercials and not always on features?

I am my own camera operator on commercials and music

videos. I like being able to change focal lengths easily. For the work I do on fashion and perfume commercials, I want to be able to freely move the camera along with tracking and zooming. I love this work. And the go-to lens is really the Angénieux Zoom, which I say regardless of the fact that they are kind enough to present me with the Angénieux Award.

It's interesting. I recently used the Full Frame Angénieux Optimo Ultra 12x zoom on two of three commercials in Paris. But, one of the commercials required a very different look. And so, I used the 24-480mm T9 zoom lens similar to the one Stanley Kubrick had on *Barry Lyndon* (1975). The result is quite beautiful. You remember in *Barry Lyndon*, how these zoom shots started tight and go wider very slowly?

Elegant, seemingly endless, slow and smooth. Where did you find this vintage Angénieux zoom?

It was from RVZ in Paris.

Of course, from the amazing Samuel Renollet who runs the RVZ camera department and loves lenses.

Samuel, exactly. He's wonderful. Samuel is really a friend and he's incredibly helpful. I see him a bit like Henryk Chroscicki. He found this zoom lens. I was testing lenses and spent an afternoon at RVZ with our camera assistants. Samuel pulled out this 24-480 Angénieux and I did not know its history.

In fact, the Angénieux 24-480 started as a 16mm format 12-240 F3.5-4.8. Ed DiGiulio of Cinema Products added a 2x extender to make it a 35mm format 24-480 for Kubrick. The 24-480 was not very sharp compared to lenses today, but it was sharp enough and it was just right for the commercial we were doing.

And probably in this digital era, the lens looks even better now than it did on film then?

Yes. When we using it, there was such a quality to the image: it was not perfectly sharp, but it had this wonderful patina and poetry in the glass that was exactly what the Director wanted for this project.

Have you tried the new Angénieux Full Frame (Large Format) Optimo Ultra Compact Zooms and Optimo Primes?

I wonder if they can be expanded to use with the ALEXA 65. I prefer that camera and have been using it for recent movies including *Okja*. That was the first movie I photographed with the ALEXA 65. Then I used it for the entire Apple TV series *Lisey's Story*. Next, I used it on *Bardo*, directed by Alejandro Iñárritu in Mexico. And then again on *Armageddon Time* for James Gray that we recently finished in New York and was presented at Cannes a few days ago.

What about the frenetically-paced *Uncut Gems*?

That was mostly Kodak 5219 500T 35mm film on Arricams and ALEXA Minis at night with long lenses and zooms: Panavision anamorphic C, E, G, T primes, plus ATZ and AWZs zooms.

Your setups on *Uncut Gems* are always moving and the lenses look wide open. A hero of that film was the focus puller.

We had the amazing Chris Silano. He is a fantastic Focus Puller. He came with this incredible range finder, the Light Ranger.

Preston Cinema's Light Ranger 2. I noticed it is even given a

Darius Khondji, ASC, AFC at Cannes

Darius Khondji awarded an Optimo from Angénieux's Emmanuel Sprauel.

credit at the end of the film. You seem to prefer Large Format and Larger Format these days?

I love Large Format. I'm in love with the ALEXA 65. I love the way it photographs actors. I'm not interested in the resolution or sharpness of the image on a portrait. I'm interested in sharpness for landscapes. But, on a close-up, I usually break up the sharpness quite a bit. I'm interested in using softer glass and things for portraits of actors. So, the ALEXA 65 provides this incredible presence that I like. When you shoot a test, if you put an ALEXA 65 and an ALEXA LF side-by-side, you see the difference. The presence of the character and the perception in front of you at different distances is going to be completely different. And that's what I like with this camera.

Is it the compression of background to foreground, the perspective, the fact that you are using longer focal lengths?

I don't know what it is. It's something very special.

Magic.

It's magic. It gives me a pleasure that's close to film, and it gives me a pleasure I have with anamorphic lenses.

Do you like shallow depth of field? Or do you often stop down?

I like shallow depth of field, but not extremely shallow because I have already seen too much of that. But I also don't like deep focus unless it's really necessary to tell a story or a moment in a scene. It is great to see deep focus in *Citizen Kane* or a Wes Anderson's film, when it's a style, when it's something that's proper to the film Director's telling the story. But I prefer selective focus, the personalized feeling of having the background slightly softer.

Maybe we should call ALEXA 65 "Larger Format" rather than Large Format? Do you only use Larger Format lenses on Alexa 65, or, if you find Large Format / Full Frame lenses that you like, would you put an expander on them?

Yes. That's what I do all the time. That's sometimes a painful process because I love old glass, old lenses. I have some of them expanded to be able to have a wider-angle lens on the ALEXA 65 without cropping the sensor. The moment you start cropping

this beautiful large sensor, it's not the same.

How did this French guy come to America and do such amazing work with David Fincher on *Se7en*?

This French guy got very lucky to do this very exciting American movie with this great Director. It was very early on in my career and he had probably seen some commercials and music videos that I had done. He was, at that time, very big in commercials and music videos. He came to Paris to do a Nike commercial and asked me to do it with him. Then he sent me the *Se7en* script to read and I was lucky to do it.

You did a lot of great big budget commercials. Do you prefer commercials or features?

I really love movies the most. I always did commercials, from the beginning. I did commercials in between movies so as not to do just any movie, because I had to live, to earn a living. Very soon, I had a wife and children and I also had to think about the practicalities. I didn't want to compromise myself, and my wife agreed that I should not compromise by doing movies that I didn't really fully care for.

When I started my career, I was doing commercials and short films. I worked with a new commercial production company and I was always testing and experimenting. In the mid '80s, we did cross processing, pushing the negative, pulling, shooting with Ilford, Agfa, Fujifilm and Kodak. Some young people started a film lab called Les Trois Lumières, the Three Lights. They were just out of film school. I used their lab for lots of experimentation, for example a black and white film that we printed on black and white sound stock.

When I started shooting features, I figured, well, let's continue doing commercials in between movies. Sometimes I found myself getting carried away shooting too many commercials because they were paying great money. And then I realized that I was not doing enough movies. Much later, I corrected this, and now I'm mostly doing movies and very few commercials. I just happened to do three movies in a row, without a single commercial in between.

I rarely do commercials now. I do movies. I've been lucky to be able to choose those movies that I really want to do. I'm very specific about that. I wouldn't do a feature film if it's not something that was extremely important and that I cared about. I don't want to do just any movie to earn a living. And yet, as we talked about earlier, I came back to Paris to a series of three commercials.

Do you continue to experiment with commercials, pushing the limits—because they are almost all about the image and style. Isn't that fun?

Yes, it's fun. But you can develop bad habits doing commercials. You really have to have armor for protection when you do commercials. It's a different race. On a commercial, you sprint. Every frame, every shot counts. A commercial lasts anywhere from 15 seconds to 2 minutes in Europe. On a movie, you can't work like that. You can't do 10 scenes in a row with such incredible visuals that you lose sight of the story.

You can't work like that. Emotionally, it's not right. When you read a script, there are some moments that come down to

Darius Khondji, ASC, AFC at Cannes

Nicolas Winding Refn and Darius take a selfie. Photo: Pauline Maillet

decisions as to whether the light can be soft and flat. It can be front lit. Commercials and movies are completely different. Maybe I'm too rigorous about the distinction. But, I need that discipline to do movies. Otherwise, I would end up shooting only commercials. This is my philososphy.

What did you mean by having to protect yourself, having armor?

I meant that if you're not careful, you start photographing movies in a different way. You start caring only about the look, the visuals, not realizing the arc of the story, what you should be doing to advance the script. You lose the generosity that you need to give a Director and the means to tell the story.

I really believe this. It is personal. I may not ever have said this before, actually in these words. But I think it's really important to separate the way you work emotionally. When I do commercials, I have great emotions. I meet young film Directors on commercials and I'm still very excited by doing commercials. It's a different thing.

I don't want you give the impression that I'm doing commercials just for the money. No, I'm experimenting, I'm learning. When I went to the rental company RVZ that I was telling you about, I had to prepare for those three different commercials. I wanted to look at all the different, crazy, interesting lenses that Samuel had. I spent the entire day experimenting with different looks with Nikkor, Olympus, Moviecam, Angénieux and many other different lenses.

Would you say that you are really pushing the visual boundaries in your experiments with commercials, trying new things? As you said, artistically they are two disciplines. It's almost like comparing still photography with movies. Are commercials somewhere halfway in between?

Yes, exactly. Commercials for me are closer to still photography, except they are more like stills in motion.

Does the story in a movie inform your style and influence the lighting as well?

I don't talk so much about my style because I let the other people judge the style.

But it's subconscious.

I do not like to talk about my work because I would be over-critical. So I try not to do it. I don't think about style so much.

Taking a technical tack then, how do you approach lighting? You show up in a room like this, there are windows, but it's on the 14th story of a tall building and you have to shoot a scene in this room. How do you approach it?

It depends if it's a film or a commercial.

Okay. Let's do one of each.

If it's a film, I listen to the Director. We talk about the scene, we bring in the actors, the Director describes the situation, we see how the actors work in the scene. They rehearse. Then we decide how we're going to shoot the scene. Maybe I don't light it, or I light it, or I black out half the windows, or I shoot against all the windows, or sideways against a wall in a different direction and I try to give it shape to help the idea of telling the story.

Everything is related to the story and the emotions of the characters. We design the concept of light and sharpness or how it's photographed. Movies involve what angle looks best, but what the actors do comes first. What is the scene telling us? What is the actor doing? What is the point of view? Is it the point of view from inside the room, from outside the room, from many other possibilities?

In a commercial, it's all about the look, the design, the light. So the lighting is decided from what angle looks the best.

When you're discussing a scene with the gaffer, do you use specifics? Do you say, "Put a 10K over there," or just "Give us a source from this direction." What's the language?

I'm more or less specific but I love sharing with the gaffer. I like it when the people working around me provide their input. This is very important for me in the process. One of my favorite things is when the Director feels the emotions of the lighting. It's very important.

What films of yours did you enjoy the most?

Of the movies that have been released so far, I love *Okja, Uncut Gems, The Immigrants, Se7en* (of course), *Amour, Evita, Delicatessen* and *Treasure of the Bitch Islands*. I had a lot of pleasure expressing myself with the camera on these movies.

You were saying you mostly use zooms on commercials and primes on features. When would you use a zoom on a feature?

I use zooms on features in very specific situations, but not all the time. I don't put the zoom on the camera and spend all day with it.

Is because the primes give you more discipline and you're not operating the camera on features?

Absolutely, that is one of the reasons. On movies, primes provide discipline. On commercials, zooms provide flexibility.

Angénieux at Cannes

Séverine Serrano, Managing Director, Sales & Marketing.

Emmanuel Sprauel, President, Angénieux. Photos: Pauline Maillet.
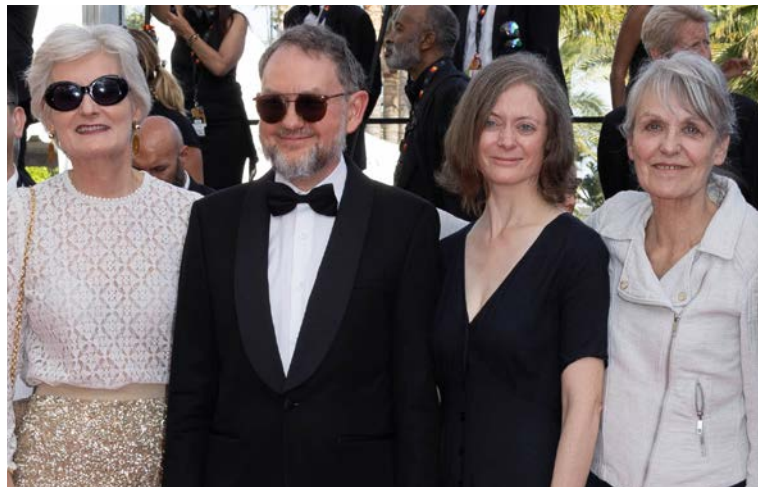
In black tie: Dominique Rouchon, Deputy Managing Director, Sales-Marketing & Communication, on the Red Carpet at Cannes.

Angénieux Partners worldwide, L-R: Jack Yu, Deputy General Manager of Jebsen; Ronit Band; Amnon Band; Emmanuel Sprauel.

Amnon Band, President of Band Pro, Angénieux Distributor for Americas.

Masterclass: Darius Khondji interviewed by Jordan Mintzer.

Evelin van Rei: Angénieux Special Encouragement Award at Cannes

L-R on the red carpet at Cannes: Evelin van Rei, Séverine Serrano, Liv Corfixen, Nicolas Winding Refn, Amira Casar, Darius Kondji AFC ASC, Philippe Parreno, Emmanuel Sprauel. Photo © Olivier Vigerie.

Evelin van Rei was honored at Cannes with the Angénieux Special Encouragement Award, which recognizes next generation cinematographic talent. She was nominated for the BSC Short Film Cinematography Award in 2018 and 2019, hailed by British Cinematographer Magazine part of the 'New Wave' in 2019, and invited to join BAFTA as a full voting member in 2021. Her latest credit includes Apple's Bad Sisters.

Jon Fauer: Where did you grow up and where are you now?

Evelin van Rei: I grew up in a small village in The Netherlands, where escapism into cinema became my lifeline. Image creation, both still and moving, became a tool to explore my life experiences, to express and communicate complex feelings and emotions. It empowered me, and it has become the way I see and experience life, and through which I am trying to make sense of it all.

I studied fine art and art history in high school, left The Netherlands at 19, and graduated from the Cambridge School of Art in England with a first-class BA (Hons) in film in 2012. It was here where my interest and fascination in experimental film, Super16mm installation and image-making took off. I am currently based in London, and shoot worldwide in commercials and narrative.

Jon: How did you get your start in the film business?

Coming from a low socio-economic background and without any privilege, or connections in the film industry, for a year-and-a-half after university, I worked a full-time office job on minimum wage, while figuring out how I could financially sustain myself in film. I moved to London in 2013, got my first job as video assistant on a feature film, quit my office job, and continued as a camera trainee and clapper loader for a few years, before transitioning into lighting in late 2014 on short films, music videos and commercials. Then, around 2016/2017, I thought, "Okay, I need to stop assisting, and solely light, as nobody's going to hire a cinematographer who also still assists..." I jumped in the deep, and hoped for the best!

Where do you see your career going?

I would love to move away from TV and position myself in feature films in Europe and the US, as well as commercials globally. I dearly miss cinema as an art form and projects that have substantial meaning, as well as travelling Planet Earth. When I was very young, I dreamed of being an architect, or a politician to fight for the protection of our environment and humanity. Then I thought, "But art can be a political medium too. I can

Evelin van Rei at Cannes

Evelin van Rei receiving the Angénieux Special Encouragement Award from Séverine Serrano, with Agnès Godard, AFC, at rear.
Photo: Pauline Maillet. Cannes May 27, 2022

Evelin van Rei.

make films and change the world." That desire has never left me. Progression within a career can be slow, tedious even, and you may have to take a path you're not too keen on taking, but it's all part of the journey that takes you to your destination, or to the part of life's journey you're excited about. It's about the little victories, little steps, and growth and insights along the way.

Darius Khondji, who works in both commercials and features, said that he prefers features because of the ability to tell a story rather than focus mainly on visuals. What do you think?

I'd agree with Darius mostly, as one of my "nightmares" would be to become an image creator of just "pretty pictures." For me, it's so important that images carry substantial weight and carry meaning. Though I do love shooting commercials abroad, as new places, different light, and countries inspire me, it gives me insight into my own life, and creates gratitude for what I have. Cinema is an art form that should allow, or at least try, us to dig into our psyche, examine our biggest questions in life, share stories, examine ideas, change laws, move entire civilizations, and improve our governments. It can and should be so much more.

Is your visual style informed by the script or something else?

I'll respond to the needs of the script and story, and will always follow my intuition when visualizing. It's an instinctive process. I have developed a distinct taste and will always seek to imprint my signature on the images I create—for them to be recognizably mine. Authored.

That's why I adore shooting fine art still photography, as the control I have is freeing. It's authored, expressive, instinctual and incredibly collaborative with each subject I photograph. It's a dance between the two of us, which fuels the creation of the images; the relationship is visible "on screen." I picked up still photography during university, where another teacher said the

best thing I could do to develop my eye was to "look at things, look at light, look at people, photograph," and I did.

Light is life. Light, and life, are key motifs in my life: architecture, nature, interior and landscape design, fine art. Everything in our environment is about light, and the colors within—how it moves you physically, emotionally, how it makes you feel, whether you feel safe, comfortable, what it does.

I am technical, but that part of the job doesn't really excite me. For me, it's all about story, emotion, how things feel. I'm intuitive, though I'm a meticulous planner, well organized in pre-production, which allows me to go with the flow during principal photography. People have asked me, "Why do you frame this way?" I reply, "That's just how it's supposed to be framed." You just know. You can't explain some things rationally.

I am fascinated by the complexities and fragility of human existence and the human mind. I am intuitively drawn to the conscious, unconscious, subconscious, and behavior. Image creation lifts the veil on the human experience. It explores the nature of our existence and emphasizes the experience of the feeling, living, human individual, and the fundamental nature of reality.

Cinema is an art form that allows us to transcend into something far bigger, to explore philosophical questions about life, death, our deepest values and the meaning by which we live. It is visual poetry, as emotionally resounding as paintings, often created from the broken. You can't always create from something that isn't broken or imperfect. Imagery has the capacity to move us into unknown emotional depths. They contain energy. I strive for my imagery to have a sensitive and distinct point of view on the world, to carry a personality and a distinct style, to capturing life in an eternal, intriguing way. I would like to leave behind a legacy as an artist that is remembered by others.

Randy Wedick's Optimo Prime IOP Seminar at Cannes

Randy Wedick is a former camera assistant, always a cinematographer, and now CTO at Band Pro in Burbank, CA (distributors of Angénieux to the Americas). As a leading expert on the Angénieux IOP internal optical palette system, Randy was invited to Cannes to present seminars on Angénieux Optimo Prime lens customization.

Jon: Who attended your seminars at Cannes?

Randy: About 75% of the people were from rental houses and 25% were cool DPs. I also had a private session with Darius Khondji, ASC, AFC. Actually, Darius Khondji is one of the main reasons that I got interested in cinematography. I've seen most of his films and have always been impressed. Around 1999, when I was at a production company where he was working, we met briefly and I asked him all kinds of questions. He was so patient. And now, 23 years later, I met him again at Cannes and he was the one asking me questions. That was just totally crazy.

I got a chance to spend some time with him and show him the Angénieux Optimo Primes. We talked about some of my test images. He provided some really good criticism.

What did he suggest?

He said I should shoot wide open and always include minimum focus. We also looked at various IOP looks with a model on a set. There were a bunch of lights and he said, "Why are all these lights on? Turn all them off except this one dimmed down to 10%. You don't need anything else." It was side lit, moody, very close, wide angle, wide open on a Full Frame camera. And then

he said, "Oh, this is what I was looking for."

How do you give these presentations? Do you actually take a lens apart and put it back together again?

It's a three part seminar. It's sort of like a magic show. There's a brief PowerPoint-ish presentation essentially about how we got here, why people are customizing lenses, and what the differences are.

The second part of the presentation is a live demonstration of the process of changing the look by swapping IOP elements, iris and rear filter. The third part of the session is walking over to a lit set with lenses and lights and models and seeing it live. It's like a tasting menu of internal filters on different lenses.

How is the Angénieux IOP system different?

DPs are constantly looking for different paths to various looks.

With vintage lenses, you're either using older mechanics or colors and coatings that don't always match. Or you're building up a color-matched set that takes years to get and then you have to get it rehoused.

If you're a DP with lots of time and a big budget, you can go to places like Panavision or ARRI Rental where they can pull the lenses apart, detune and put them back together. That's not available at your typical rental house. They would have to employ one of the cabal of super geniuses to do this for you. It's only available at the very tip of the top.

Or, you could have your lens re-coated or de-coated. But then

Optimo Prime IOP Seminar at Cannes
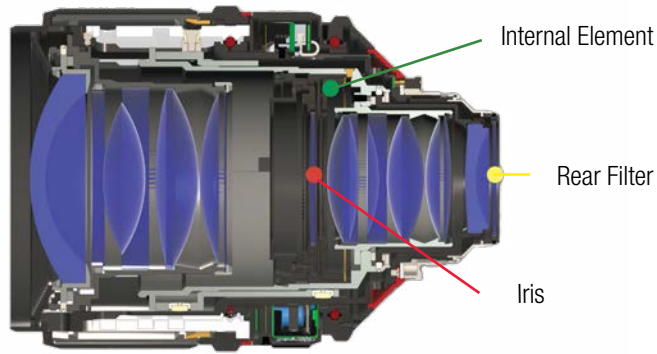
Cutaway view of Optimo Prime's 3 points of IOP customization

Tools of the trade for Optimo Prime service and customization

Optimo Prime 28mm at left and with focus group removed, right.

Internal Element removed, ready to be swapped for another.

you're forever stuck with that one look and you'd better hope that it stays in fashion throughout the lifetime of the lens so you can make your money back. All of these things are like a three-legged table: availability, price and time—or lack of time.

The Angénieux Optimo Prime IOP system was invented to fill the space for cinematographers and projects requiring highly customized looks, but who would also like the ability to return back to the original, modern look. Whereas some de-tuned lenses require a very high-level optical technician to make adjustments, the Optimo Prime IOP system is cartridge based, with threaded assemblies and keyways. You can't really mess things up too much and it's easily done in 10 minutes or less once you get the training.

What do you mean by cartridge-based system? Is it modular?

Yes, the cartridge based system consists of a center internal optical element, an iris module and a rear filter. It allows for some intense experimentation and also the ability to reverse that experimentation and bring the lens back to its default settings.

Did you change internal elements in the demos at Cannes?

Yes. These demos, which we have been doing all over the Americas, are usually not just with me. A skilled lens technician works on the lens while I do the presentation. At Cannes, Arnaud Esbelin, Angénieux Program Manager for Cinema Optics was doing the hands-on work. In the US, it's Band Pro lens technician Ronald Monte.

How is the Internal Optical Element different from a filter at the front or rear of the lens?

The Internal Optical Element is positioned at Principal Focal Point—where the light rays converge within the lens. If your Internal Element has, for example, uncoated surfaces, the light is going to ricochet inside the lens. These complex reflections and internal barrel flares are things you wouldn't have if you put an uncoated filter on the front. That's why the simplest uncoated filters generated so much interest recently.

Furthermore, if you have a diffusion element, it also takes on different and interesting qualities than front filtration. Another benefit is that you can use the same strength with every focal length. You don't have to change out the filter strength when you have an 18mm with a heavy diffusion and a 100mm with a might lighter grade.

Please explain why you can stay with the same grade of filter.

It's because of the field of view. The wider focal length lens takes in a greater amount of the front filter area, effectively with more dispersed particles of diffusion. A telephoto lens will shoot through a much smaller, and therefore denser area of diffusion.

The Internal Optical Element can save Camera Assistants lots of time and aggravation switching filters to maintain consistent a diffusion effect whenever there's a lens change. Often it's a guessing game. Sometimes it's not. With the Internal Optical Element, you can be sure that the density you pick is going to remain consistent across all the focal lengths.

Randy will discuss the remaining variables of the IOP system in a future edition of FDT.

AJA ColorBox

AJA
ColorBox

ALEXA 35 with Teradek Bolt 4K Max transmitting 4K SDR video to Bolt 4K receiver
connected to AJA ColorBox that is feeding a SmallHD Cine 24 monitor on a DIT cart.
Thanks to Andy Shipsides, Mike Sippel and Sam Fornasiero at ARRI Rental NY.

AJA ColorBox

The new AJA ColorBox is a star of seamless on-set color and look management. It can accept up to 4K 12G-SDI video and output live color processed images in real time via SDI or HDMI to monitors on set. ColorBox has a built-in webserver that is controlled by a web browser user interface on your computer.

A LUT Box sits in-line between camera and monitors, usually on the DIT's cart. But this is much more than a LUT box. Tim Walker, Senior Product Manager at AJA, explains: "ColorBox can receive Log images from a camera – and using the 12-bit RGB AJA Color Pipeline (with 1D LUTs, 3x3 matrices, and a 33-point 3D LUT with tetrahedral interpolation) – can transform them to SDR or HDR with very accurate color processing. The DIT on set can cycle through LUTs or pipeline presets and choose the desired creative look. With Livegrade or Assimilate control involved, the look can be fine-tuned in real time, on set. Even without 3rd-party software, you can tweak the image with the ColorBox's built-in Color Corrector and ProcAmp."

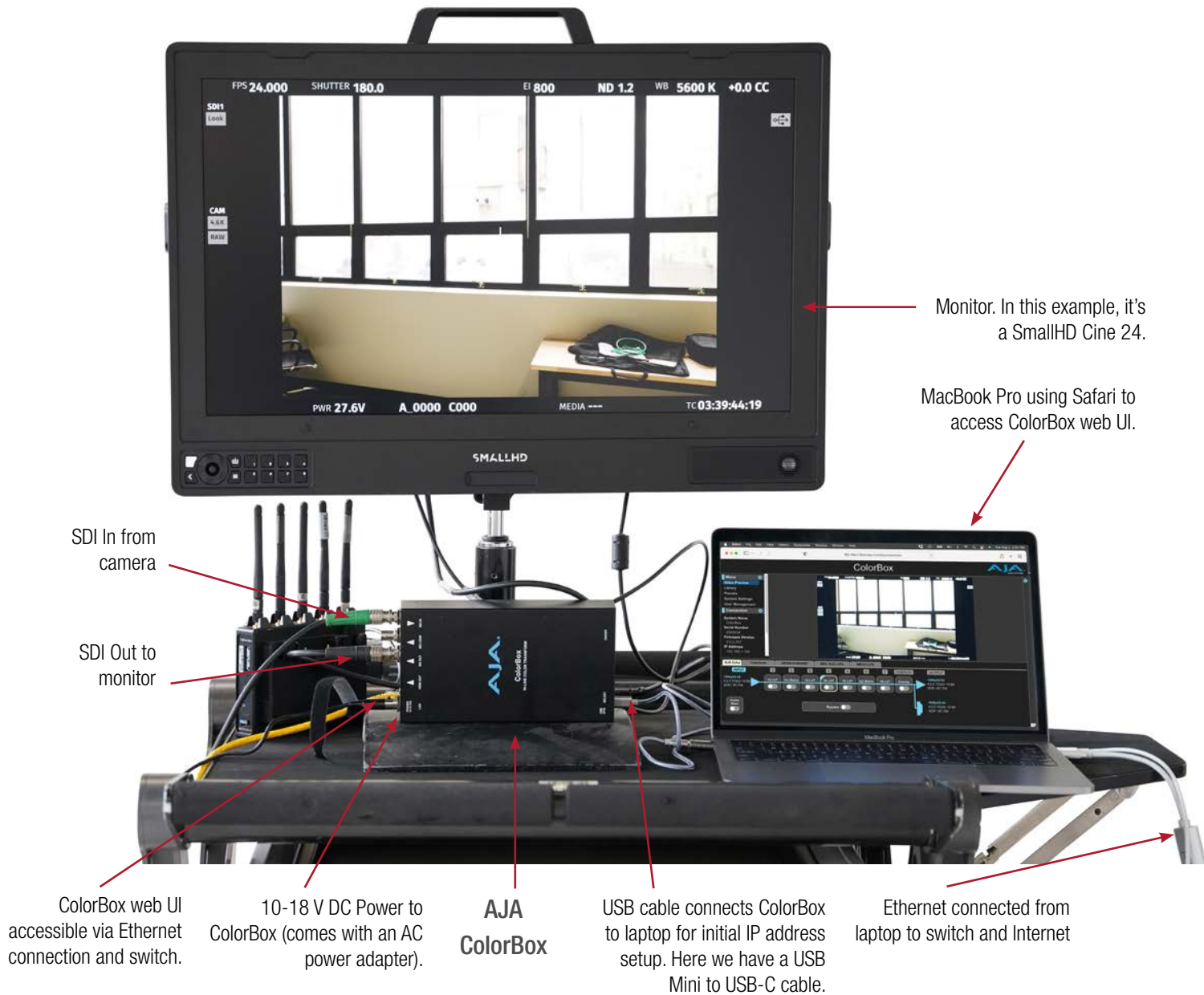Colorbox works with almost any camera that outputs video. For high-end production, the camera probably will send Log video directly to the DIT cart. The DP may want to view SDR and HDR monitors, the focus puller might want a high contrast Rec.709 image, and the director will appreciate a monitor that shows how the movie will look. So the well-equipped DIT will enjoy a cart full of ColorBoxes.

The words LUTS and Looks get tangled. There are "LUTs that you need"—these are the essential viewing LUTs transforming the camera's Log color space into images that can be displayed on SDR and HDR monitors and viewfinders.

And there are the "LUTS you want" —the creative Look Up Tables that define the style of the scene and add character to your work.

So now, the well-equipped DIT can load an AJA ColorBox with essential display LUTs and creative LUTs, including the latest ALEXA 35 ARRI LogC4. These can include looks that the DP has established with the colorist in advance, ready for live processing in the AJA ColorBox's AJA Color mode. The AJA ColorBox is a very versatile device on set or on location—and not only for cine but also broadcast and live-event production.

AJA ColorBox

Monitor. In this example, it's a SmallHD Cine 24.

MacBook Pro using Safari to access ColorBox web UI.

SDI In from camera

SDI Out to monitor

ColorBox web UI accessible via Ethernet connection and switch.

10-18 V DC Power to ColorBox (comes with an AC power adapter).

AJA ColorBox

USB cable connects ColorBox to laptop for initial IP address setup. Here we have a USB Mini to USB-C cable.

Ethernet connected from laptop to switch and Internet

What can AJA ColorBox do?

- AJA ColorBox is a powerful tool for on-set look management.

- It has 5 key modes: AJA Color, Colorfront, ORION-CONVERT, BBC HLG LUTs, and NBCU LUT.

- Cine production on set and on location will love and live in the AJA Color Pipeline (ACP).

- You control ColorBox with a web browser user interface that includes video preview. It doesn't need an Internet connection.

- You can import LUTs into ColorBox's library and export out.

- You can connect Pomfort Livegrade Pro for real-time color grading. Note that despite its name, Livegrade alone does not output in real-time SDI video. Livegrade goes live when connected to ColorBox.

- A bypass "switch" in the web UI lets you toggle a look on or off.

- ColorBox offers a wide range of transforms including SDR, HLG, PQ, BT.709 and BT.2020 color gamuts, and more.

- ColorBox can load or capture up to 16 frame grabs internally and recall them for review or frame matching. These are stored as JPEG, PNG or TIFF files, up to 4K.

- ColorBox passes SDI camera and lens metadata through to the monitor. As in the example above, you can see fps, shutter angle, etc.

- ColorBox requires an SDI input. What if your camera only outputs HDMI? Simply use an AJA HA5-12G HDMI to SDI converter inline.

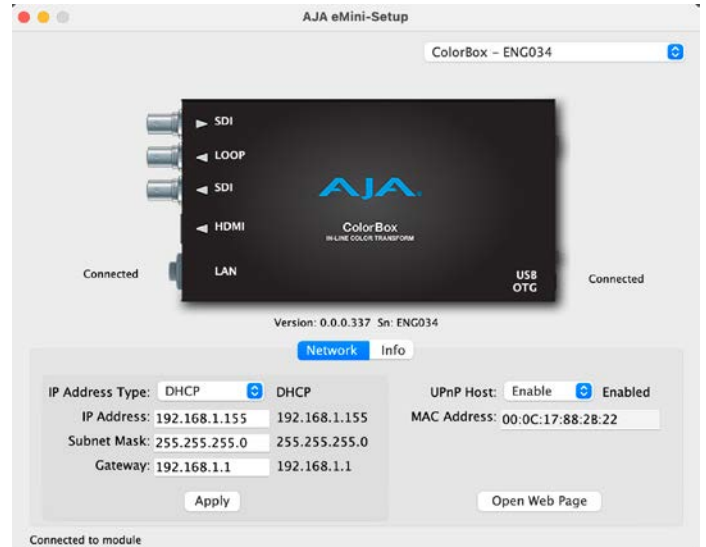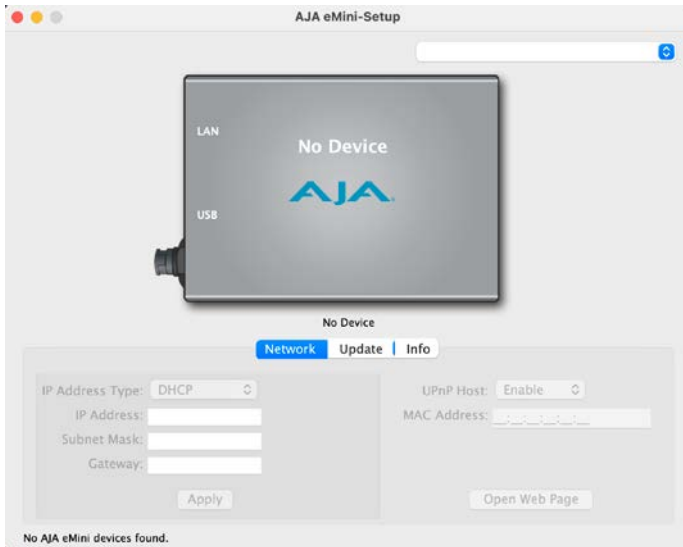- You can fit up to 4 ColorBoxes in one 1RU rack shelf.

How AJA ColorBox Works


ColorBox front

ColorBox rear

1. Download AJA's free e-Mini Setup. *www.aja.com/family/software*
2. Install the software on your computer.
3. If it looks like this, above, you haven't connected your computer to the AJA ColorBox via the provided USB cable.

4. Ideally both the ColorBox and your computer connect to the same switch and share a local network.
5. If so, DHCP should populate the IP address, subnet mask and gateway.
6. Click APPLY and then click OPEN WEB PAGE.
7. By the way, at this point, you do not have to be connected to the Internet—a hard-wire Ethernet connection from ColorBox to computer will suffice.
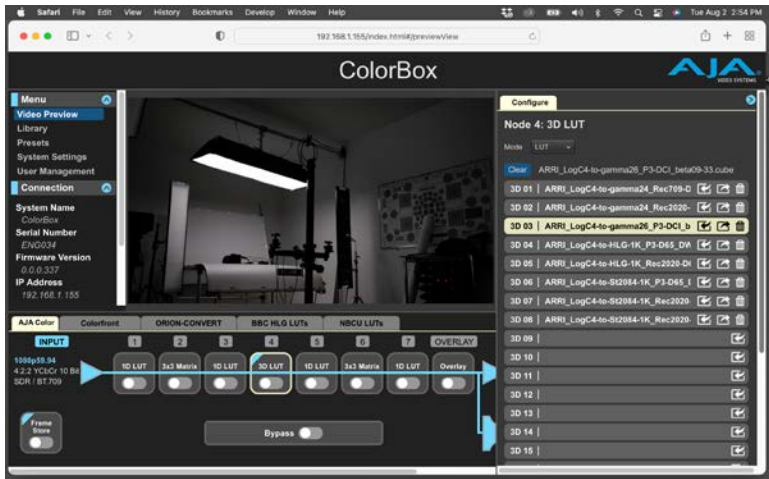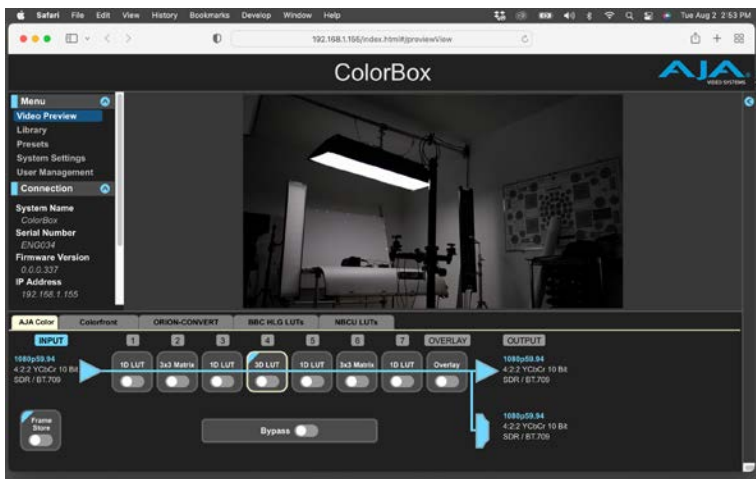
7. The ColorBox web-browser user interface opens. In this example, we're on Safari on Mac.
8. Let's click on the AJA Color tab below the video preview and click on the 3D LUT node. The edge of the box turns yellow to show it is active.

9. In this example, we loaded the latest ARRI ALEXA 35 3D LUT Package of .cube files for color space conversion of the camera's LogC4 format. New ARRI LUTs are available online at: *fdtimes.us/ARRI-Downloads*

How AJA ColorBox Works

ColorBox rear, connected
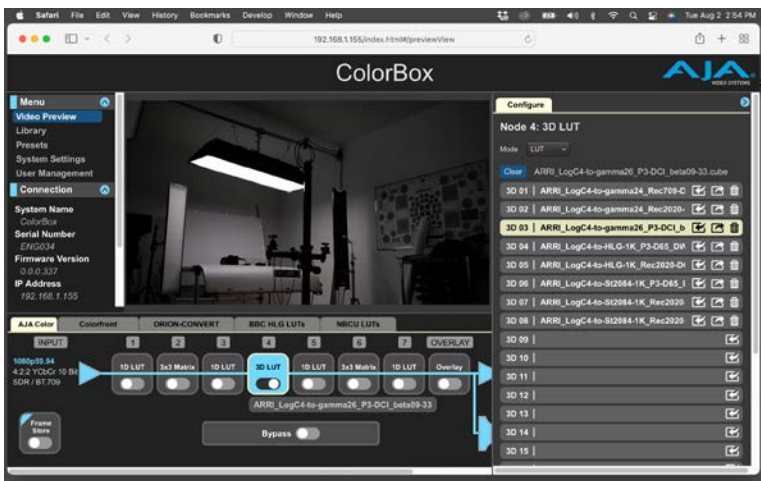
10. Activate the node by "turning on" its "slide switch."
11. To try another LUT, select it from the list at right.
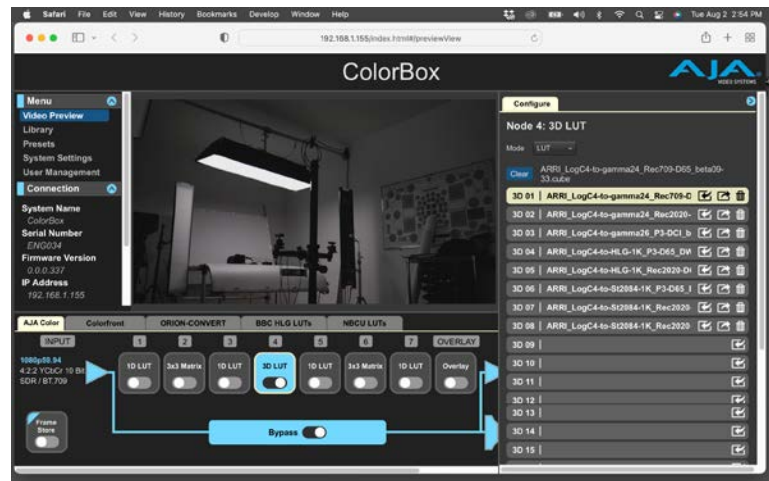
12. Toggle the node on and off to see its effect by using the BYPASS "switch." You can see it in the VIDEO PREVIEW, but of course that is just a confidence monitor; it is best seen on a larger reference monitor.
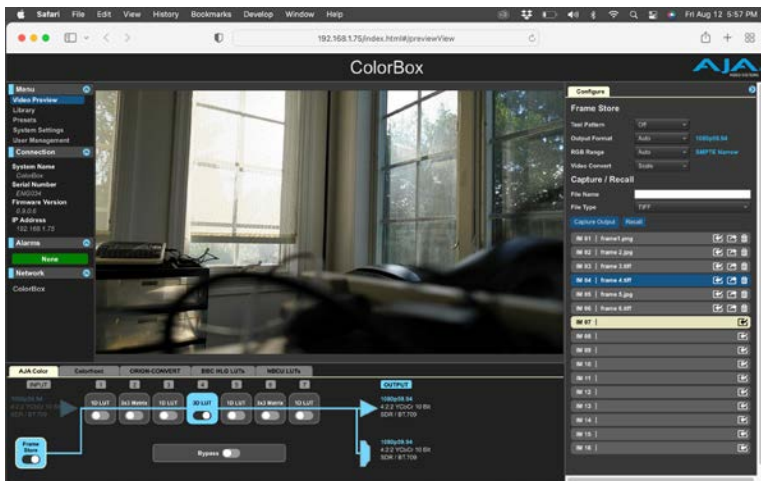
13. Click the FRAME STORE node and activate its slide switch. Click Capture Output to grab a frame or or click Recall to summon up a previously stored frame. There's also a test pattern generator.
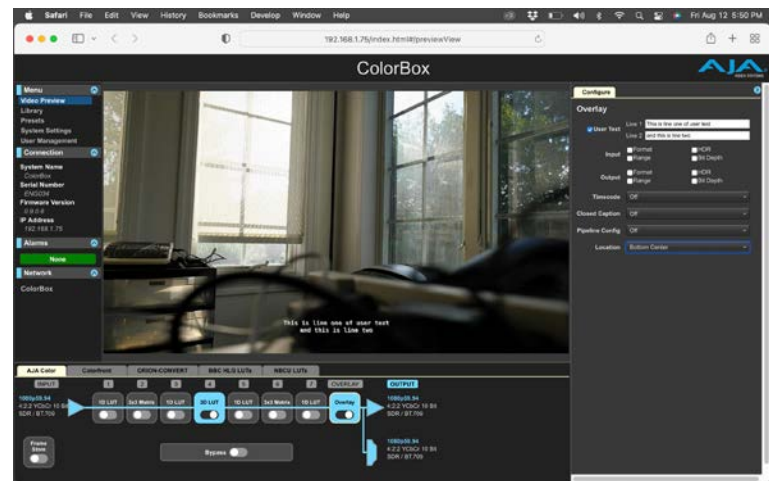
14. Click OVERLAY to enter on-screen text and use the slide switch to activate it.

AJA ColorBox for DITs
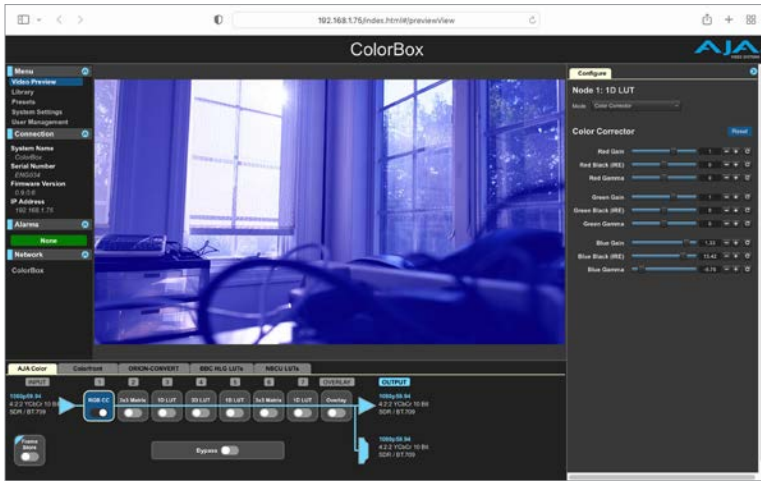
15. Activate RGB Color Corrector sliders by right clicking the node and selecting Color Corrector in the Configure box.
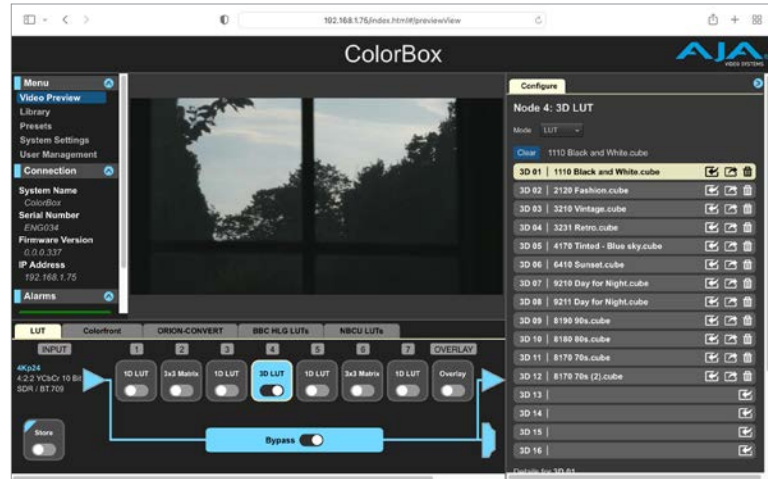
16. We imported the latest ALEXA 35 LogC4 to LogC4 ARRI Look Library ALF4 .cube files. Note that Look Library creative looks are .cube 3D LUTs that still require downstream conversion to your display color space. Download the ARRI Look Libary: *fdtimes.us/ARRI-Downloads*
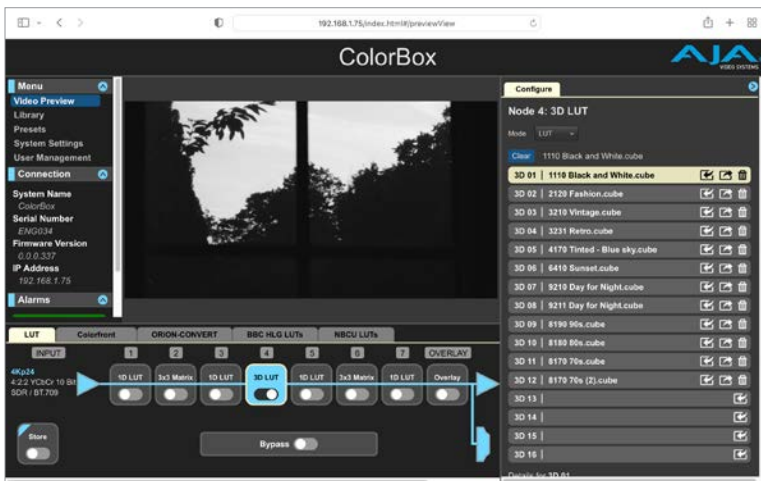
17. The LogC4 to LogC4 Look Library creative look could theoretically daisy-chain to another AJA ColorBox with 3D display LUTs shown in step 10, or by using the monitor's conversion if it has that capability. Another option is to use 3rd party software, like Livegrade, to condense the LogC4-to-LogC4 and LogC4-to-Display LUTs into one LUT for Color-Box to process. Perhaps ALEXA 35 might do this in the future as well?
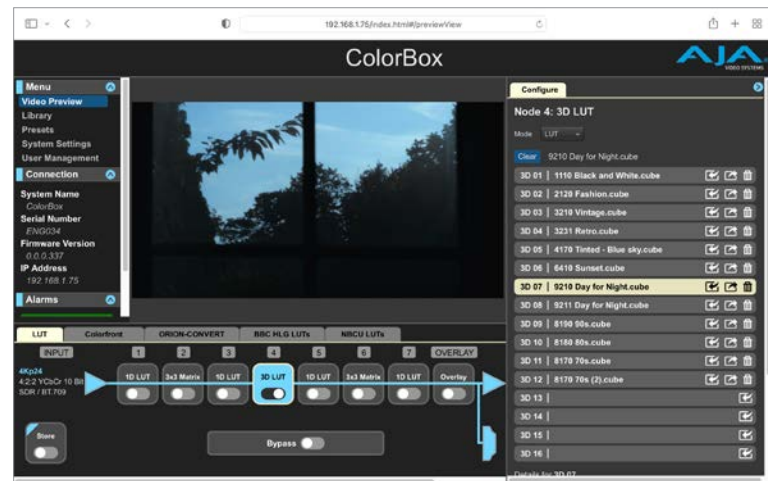
18. ALEXA 35 can output Look Library LUTs and Display LUTs. But, it's fair to say that a majority of high-end productions prefer conversions to be managed by the DIT, who, of course, will want AJA ColorBoxes.
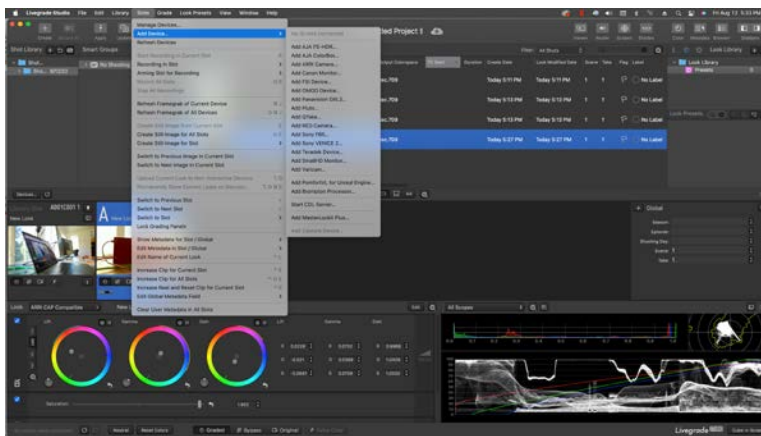
19. The latest Pomfort Livegrade Studio connects directly to ColorBox via Ethernet for live, real-time grading on set. (Note, this was a beta version.) Connect by clicking Slots>Add Device>Add AJA ColorBox...
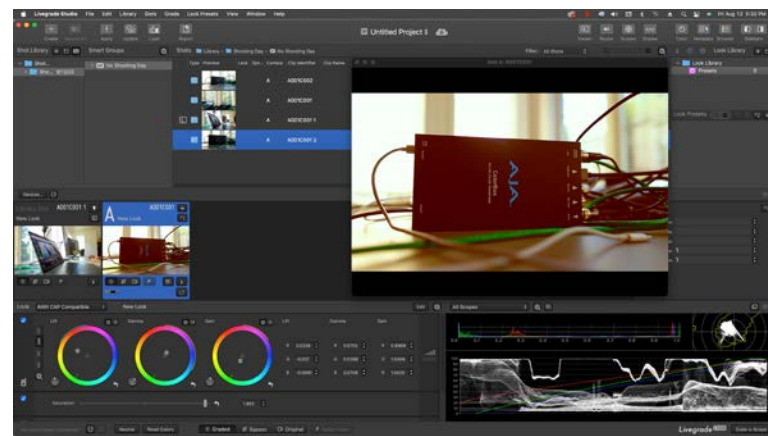
20. Real-time grading (extreme for demo purposed only) using Livegrade Studio connected to AJA ColorBox via Ethernet LAN.

AJA ColorBox for DITs

Pomfort Livegrade Studio

AJA ColorBox
Web UI

SmallHD Cine 24

AJA ColorBox

AJA HA5-12G HDMI to
12G-SDI

Inovativ
Echo 36 Cart

MacBook Pro

Mac Pro hiding back here,
driving Livegrade Studio
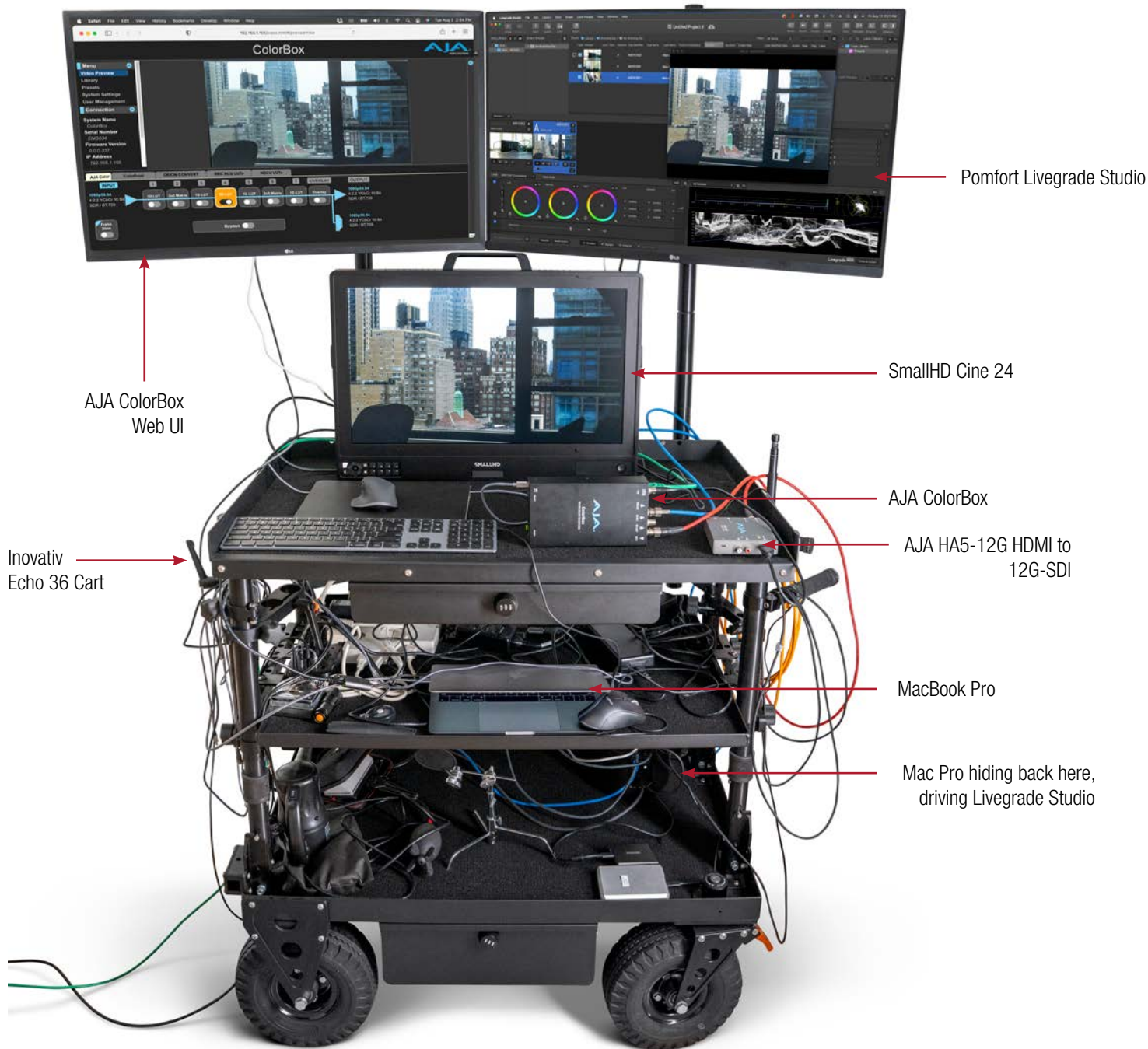
I should not quit my day job doing FDTimes to become a DIT. My DIT cart is way too messy.

A SIGMA fp L camera is outputting video via HDMI to an AJA HA5-12G HDMI-to-SDI mini-converter. It is connected via SDI to the AJA ColorBox.

AJA ColorBox connects to a MacBook Pro via Ethernet and via a Thunderbolt 3 cable to the 32-inch LG monitor (upper left) displaying the web UI of the ColorBox.

The live video feed from the ColorBox outputs via SDI to the SmallHD Cine 24 monitor in the center.

At upper right is another 32-inch LF monitor connected to a Mac Pro on the bottom shelf of the cart, running Pomfort LiveGrade Studio. Livegrade Studio will enable real-time live control of ColorBox. The 3D LUT node has been set to DYNAMIC and it turns orange when Livegrade is controlling it.

This article focused on ColorBox for Cine Production. But, as there may be more things in heaven and earth than Cine, go to *www.aja.com* for additional details and more information about ColorBox prowess for not only Cine but also .but also for live event and live production applications using ColorBox's Color-front, ORION-CONVERT, BBC HLG LUTs, and NBCU LUTs color processing pipelines.

AJA ColorBox On-Set Scenarios
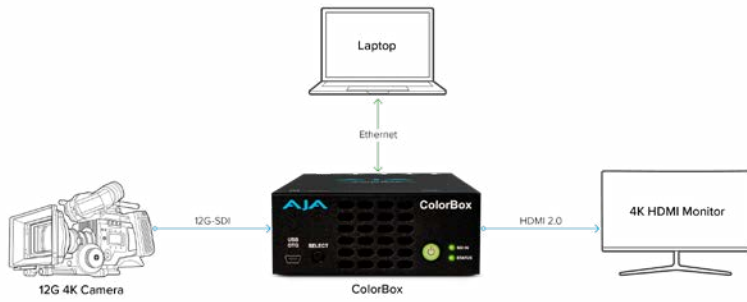
Basic setup: AJA ColorBox with
one 4K camera, laptop, one monitor
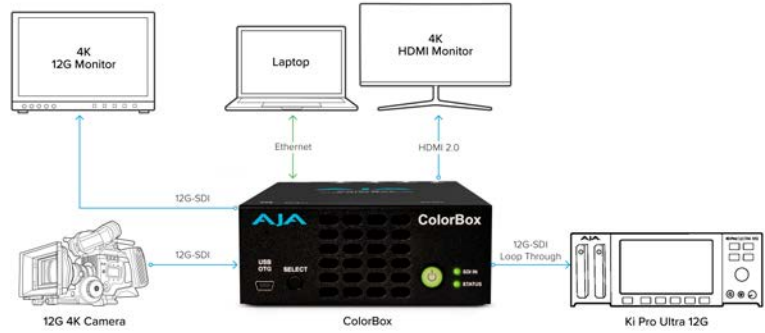
AJA ColorBox with one 4K camera, two monitors, laptop,
AJA Ki Pro Ultra 12G Recorder/Player.

Diagrams courtesy of AJA.
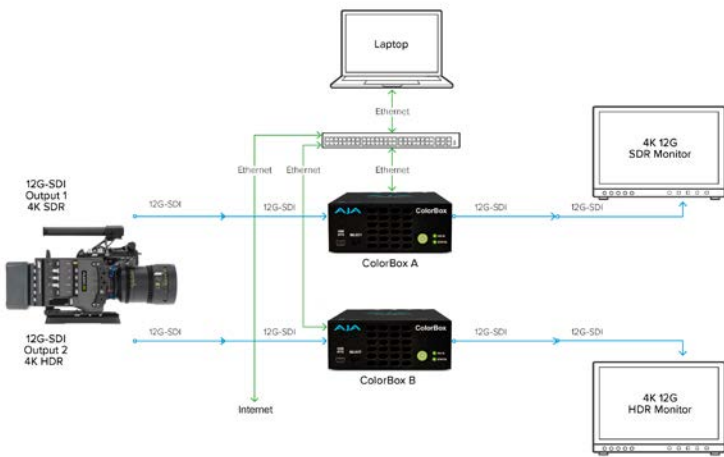
ARRI ALEXA 35 with simultaneous SDR and HDR 12G-SDI output to
two AJA ColorBoxes, two monitors (one SDR, one HDR), AJA KUMO
3232-12G SDI router, Ethernet Switch, and Laptop.
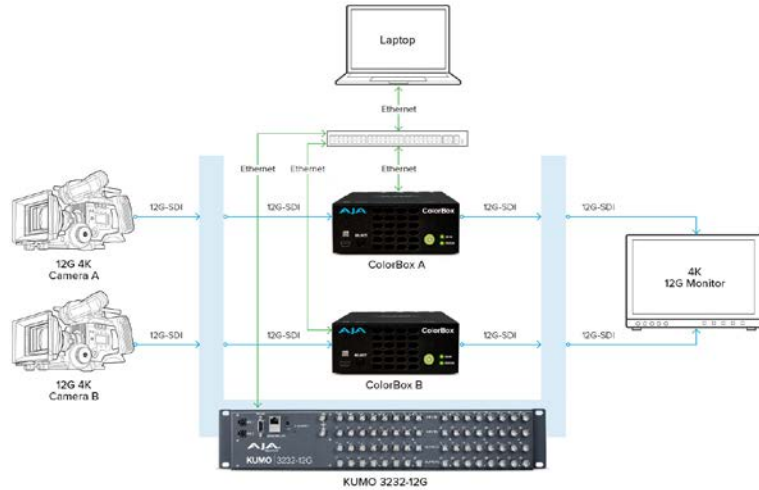
Multi-Camera On-Set Grading:
Two 4K cameras, two AJA ColorBoxes, one monitor, AJA KUMO
3232-12G SDI router, Ethernet Switch, and Laptop (or Computer).

Partial Specs

Colorimetry
• BT.709 and BT.2020
Real-Time Conversions
• HDR to HDR, HDR to SDR, SDR to HDR

Video Formats
• (4K) 4096 x 2160p, (UltraHD) 3840 x 2160p, (2K) 2048 x 1080p, etc.

Color Processing
• 12-bit RGB, Configurable range and gamut
• 5 Color Processing Pipelines: AJA Color Pipeline (ACP), Colorfront, ORION-CONVERT, BBC HLG LUTs, NBCU LUTs.
• 7 processing nodes plus Overlay; AJA Color Pipeline; 4x 1-D LUTs, 2x 3x3 Matrices, 1x 3-D LUT

LUT Processing supports:
• 10 and 12-bit LUTs
• Custom 33 point .LUT and .CUBE format 3-D LUTs (various LUT sizes are supported, but will be converted to 33 point for processing.)
• Custom .LUT format 1-D LUTs
• Tetrahedral 3-D LUT interpolation
• 3-D LUT configurable as LUT or Dynamic
• 1-D LUTs configurable as LUT, Dynamic, or Color Corrector
• Configurable Colorspace, Range, and Transfer Characteristic
• Nonvolatile storage of 16 3-D LUTs and 16 1-D LUTs

Dynamic LUT Processing
• Supports 3rd party apps for automatic loading and display of 3-D LUTs
• Reflects dynamic changes in real time from source software
• Supported by Pomfort Livegrade Pro/Studio, Assimilate Live Looks and Live Assist.

Complete specs at *www.aja.com*

New Teradek Bolt 6 Series

Bolt 6 XT MAX TX/RX Kit
Connector side

Bolt 6 XT MAX TX/RX
OLED Menu side

Bolt 6 LT MAX TX/RX Kit
Connector side

Bolt 6 LT HDMI TX/RX Kit
Connector side

Breaking News: Teradek Launches Bolt 6 Series, the industry's first 6GHz zero-delay wireless video system.

Bolt 6 transmits and receives on the newly-available 6GHz frequency band as well as 5GHz. There are three versions of Bolt 6. Bolt XT is 12G-SDI. The LT is 3G-SDI and is smaller. They both use the same 4K chip, and they both do 10-bit video. The third model consists of the Bolt 6 monitor modules that go on the back of the SmallHD Smart 7 and Smart 5 monitors.

Every Bolt 6 will pair with every Bolt 4K on 5GHz bands, but a Bolt 6 TX/RX combination is required for 6GHz connectivity.

Bolt 6 XT offers the most features in the Bolt 6 family, including a redesigned housing that's smaller, lighter, cooler, and up to 50% quieter than its Bolt 4K counterpart. Bolt 6 will have a 5-pin USB connector for SmallHD camera-control.

Bolt 6 LT is a compact, lightweight system with a 750–5000+ ft. range and operates on the same channels as the rest of the Bolt 6 line. Bolt 6 LT also comes in an HDMI-only version.

Bolt 6 Monitor Modules offer ranges of 750–1500 ft. and integrate seamlessly into SmallHD Smart 7 and Smart 5 Series Monitors, as their Bolt 4K counterparts did.

Greg Smokler, General Manager of Cine at Creative Solutions explains Bolt 6

"The Bolt 6 Series expands the power and performance of the zero-delay Bolt 4K family into the recently-unlocked U-NII 5 frequency spectrum, offering users a wealth of untapped bandwidth while remaining fully-compatible with Bolt 4K on traditional 5GHz bands.

"Basically there were two main goals for the new Bolt 6. One was to maintain compatibility for people who have invested in the system since the first Bolt 4K was launched in April 2019. Second was to deal with the growing frustration of interference that people have been encountering on the 5GHz band of the radio spectrum. When we started about 10 years ago with 5GHz, it hadn't reached the high level of saturation or popularity in consumer devices that it has by now. We had, and still have, a lot of success with that spectrum because it is still less commonly used 2.4GHz.

"However, technology has caught up and an increasing number of consumer electronics devices are dual band and definitely operating in 5GHz. There are many powerful 5GHz WiFi routers for homes, businesses and commercial areas. There is just more and more interference. And so Bolt 6 is the sixth generation of the Bolt and it unlocks the U-NII 5 band of the unlicensed radio spectrum that's mainly 6GHz.

"U-NII stands for Unlicensed National Information Infrastructure (U-NII) radio band, as defined by the US FCC. It is part of the radio frequency spectrum used by WLAN devices and many wireless devices. It's not that 6GHz is better than 7GHz. It's just a slice of the spectrum that the whole world could agree to set aside for unlicensed use.

"Anyway, we now have 12 new channels that are not really being used much by anything else. You may find some consumer devices that are using it and, eventually over the years, people will start using it. But right now it's relatively empty. That means a more robust link connectivity in all kinds of environments and more units can coexist because you can still use 5GHz alongside the 6GHz channels. One of the challenges for previous Bolt systems was that you could only operate three or four consistently in one environment. But now that's potentially doubled because you can have up to six transmitters wirelessly linked in a multi-camera setup.

"Symptoms of overcrowding with Bolt on the 5GHz spectrum could have been limited range or they simply would not connect. It just was often difficult to troubleshoot on the fly, even looking at the spectrum analyzer that we provide. It's like being in a crowded bar where even if people are shouting from a few feet away, you still can't hear them."

Creative Solutions September 2022 News by Greg Smokler

Greg Smokler, General Manager of Cine at Creative Solutions, shares a common interest in the fourth estate, curated camera gear, well-crafted sentences and craft cocktails. With barely a pause in the day's occupations of tweets, emails, calls and company schedules, Greg discussed the latest breaking news from Teradek and SmallHD.

Monitors

Smart 7 Series

SmallHD has a series of monitors that came out about three and a half years ago called the Smart 7 series, which effectively is the Cine 7 and Indie 7. Cine 7 is the high-end model, with a bright display, professional connectors, and an ethernet port. Indie 7 isn't as bright and has a few color limitations. We call them the Smart Series because these monitors run our PageOS software with touchscreen camera control functionality via a camera-specific license.

Smart 5 Series

We had not updated the 5-inch series in years and years. So, the new Smart 5 series is our newest, latest and greatest. There are three levels.

The entry level is the Indie 5. It has a 1000 nit screen, is super lightweight, and has built-in battery plates.

The Cine 5 has a 2000 nit screen, which is just as bright as our previous flagship 5-inch, the 503 U. It has a joystick and a back button. This has been a very popular request for the Smart 7 series, which does not have mechanical navigation controls.

The Ultra 5 is a 3000 nit monitor with physical function buttons as well as joystick navigation. It has optional, interchange-able Gold and V-mount battery plates, multiple locking connector ports, and versions of the Ultra 5 with a Bolt 6 transmitter or receiver built in.

Cine 4K 13, 18 and 24

Monitor size is often determined by your location or set. I think that the Cine 24 is more likely to be a video village client monitor.

The Cine 18 is a versatile video village, Camera Operator and larger monitor for Focus Pullers. It gives you a slightly larger screen size in a "mid-size" monitor but has a super lightweight and sleek chassis. In fact, I talked to DPs at BSC Expo, and they are really into the Cine 13 and the 18 as a DP monitor. What floats the boat here in the States at the moment is the OLED 4K 22 or 27.

EL Zone

We have incorporated EL Zone by Ed Lachman, ASC into PageOS 5, the operating system, , of our monitors. I think everybody who has tried EL Zone just falls in love with it because it's just so intuitive. It works the way that we think about photography.

Ed just did a black and white movie with an ALEXA Mini LF Monochrome. Using EL Zone on a SmallHD monitor, he was actually able to determine his own ISO sensitivity ratings for the camera. Obviously, when they remove the mosaic filter, the sensor will have a higher rating. I guess this was a special camera just for Ed, which didn't have a specific rated sensitivity. So he was over the moon to have done a movie with his EL Zone system.

It's rare in today's mature digital cinematography world to have something that's so innovative and adds a new dimension for cinematographers. Implementing EL Zone on a monitor is a good place because it becomes camera agnostic. That's a really cool outcome of this collaboration between Creative Solutions, SmallHD and Ed. It's his idea and fortunately our monitors are versatile enough to be able to add EL Zone pretty easily. That is mainly because of all the effort that we put in to PageOS to make these iterations and additions possible.

Teradek RT

Ever since we started working with Kris Bird and his team, we knew these wireless lens controls needed a deeper integration with SmallHD PageOS software. You now have the ability to dynamically change focus marks and settings of the hand unit while viewing overlays of your focus, iris and zoom position on any SmallHD monitor running PageOS. We think this is a unique feature for the RT to be combined with a Teradek receiver and monitor and it's a pretty awesome way to pull focus.

SmallHD Monitors for Focus Pullers and Everyone Else

The following pages started out as an overview of SmallHD Monitors for Focus Pullers. But the busy folks at SmallHD kept introducing new displays. So here's a summary on SmallHD monitors, not just small, not just HD, and not just for Focus Pullers, but for DPs, Camera Operators, DITs, Directors, Clients, Producers—in short—for everyone on set and on location.

"Filmmaking is like watching TV for 14 hours a day while standing up," a cheeky DP said. So you might as well watch on the best monitors you can get.

All SmallHD Cine Monitors shown here, from 5 to 27 inches, have rugged, unibody, milled-aluminum housings. They all have ¼-20 mounting points along the top and sides. They all run on SmallHD's familiar PageOS software and User Interface with "tools" that include EL Zone Exposure Assist, Waveform, Camera Control, Teradek RT focus and iris scale overlays, and more.

New SmallHD Cine 5, Ultra and Indie Monitors

SmallHD's Ultra 5, Cine 5, and Indie 5 touchscreen monitors are siblings in the Smart 5 family. They address a significant demand for smaller touchscreen monitors than SmallHD's Smart 7 Series. In addition to fine images, you also can get camera-control (with licenses) for ARRI, RED and Sony VENICE on a 5-inch monitor that can be easier to navigate than the camera's native menus.

All 3 models in the Smart 5 family—Ultra, Cine, and Indie—have touchscreen 1920x1080 4:2:2 10-bit displays and aluminum housings.

• Ultra 5 is the top-of-the-line, 3000-nit monitor with an Ethernet port, joystick and custom function buttons that help when you're wearing gloves, working in cold weather or at sea.

• Cine 5 is a 2000-nit monitor. It adds a joystick and "go-back" button, on the side, as a navigational alternative to smudging the display with your bagel and cream cheese schmeared fingers.

• For a few dollars less, Indie 5 is a 1000-nit monitor.

SmallHD and Teradek worked together to integrate the new Bolt 6 wireless system into the Ultra 5 monitor. The result is the Ultra 5 Bolt 6 RX 750 (Receiver) and Ultra 5 Bolt 6 TX 750 (Transmitter). They operate in the recently-opened U-NII 5 6GHz bands while maintaining compatibility with existing Bolt 4K systems on the 5GHz bands.

Together, they reduce cable clutter, consolidate batteries, enable wireless camera control, and display real-time focus and iris overlays when using Teradek RT wireless lens control systems.

Gold- or V-Mount battery plates are available. Ultra 5 wireless monitors are compatible with all Bolt 4K devices that work on 5GHz. Shipping is expected around January 2023.
smallhd.com/smart5

Ultra 5 Monitor
- Display: 5-inch LCD touchscreen, 1920 x 1080p (HD)
- Bit Depth: 4:2:2 10-bit
- Brightness: 3000 nits
- Input/Output: 2x 3G-SDI (I/O); 2x HDMI 2.0 (I/O
- Power: 2-pin Locking Power Connector
- Navigation: Joystick and User Buttons,
- Camera Control: Ethernet for ARRI & Sony VENICE camera control, 5-pin locking USB for RED camera control
- Price / Ship: $2199.00 / ships Fall 2022

Cine 5 Monitor
- Display: 5-inch LCD touchscreen, 1920 x 1080p (HD)
- Bit Depth: 4:2:2 10-bit
- Brightness: 2000 nits
- Input/Output: 2x 3G-SDI (I/O); 2x HDMI 2.0 (I/O)
- Power Input: 2-pin Locking Power Connector
- Navigation: Joystick and Back Button
- Camera Control: 5-pin locking USB for RED camera control
- Price / Ship: $1599.00 / ships Fall 2022

Indie 5 Monitor
- Display: 5-inch LCD touchscreen, 1920 x 1080p (HD)
- Bit Depth: 4:2:2 10-bit
- Brightness: 1000 nits
- Input/Output: 2x 3G-SDI (I/O); 2x HDMI 2.0 (I/O)
- Power Input: Barrel Connector
- Camera Control: Micro-USB for RED camera control
- Price / Ship: $1299.00 / ships Winter 2022

Ultra 5 Bolt 6 RX 750
V-Mount Kit

Ultra 5: Touchscreen, Front Joystick, User Buttons

Cine 5: Touchscreen, Side Joystick, Back Button

Indie 5: Touchscreen only

SmallHD Cine 7 Monitor

Simon England focusing on *News Of the World* with his SmallHD Cine7, Teradek Rx, custom sling and batteries.

This is the popular monitor to mount onboard a camera, attach to your your wireless FIZ hand unit, or roam the set with its Teradek Bolt RX receiver module.

Cine 7 is a lightweight, very bright, 7" HD monitor that can accept up to 4K SDR and HDR video.

Two BNC connectors provide two 3G SDI inputs, with the second input doubling as a video pass-through output. There's also an HDMI input and pass-through.

You can power the Cine 7 with dual on-board Sony L-Series batteries, add a Gold Mount or V-Mount battery plate, connect to a camera's accessory power port or to a D-Tap.

Familiar SmallHD PageOS software offers frame guides, focus and exposure assist, 3D LUT overlays, histogram, vectorscope, waveform, and EL Zone.

Attach a Teradek Bolt RX Monitor Module for cable-free HD, 4K, SDR or HDR wireless video from any Bolt 4K transmitter.

Upgrade with software licenses for RED, ARRI, and Sony VENICE camera control. The Cine 7 touchscreen can control camera functions and project settings such as Start/Stop Record, frame-rate, shutter angle, ISO, color temperature, white balance, clip playback, etc.

Cine 7 Monitor Specs

- Display: 7-inch LCD touchscreen 1920x1200 (7.2" diagonal)
- Brightness: 1800 nits
- Processing: 10-bit processing (8-bit panel)
- Backlight Type: LED
- Gamut: 100% DCI-P3
- SDI: 2x 3G-SDI in, 1x doubles as a 3G-SDI out
- HDMI: 1x HDMI in, 1x HDMI out
- Power Input: 2-pin Locking
- Weight: 20 oz.
- Dims: 7.09" w x 4.67" high x 1.32" deep
- US$ 2,199.00 with optional Camera Control software licenses for RED, ARRI, and Sony cameras and additional options for Teradek Monitor Modules.

SmallHD Cine 13 4K High-Bright Monitor

Gaggles of geese don't stop for focus marks.

The SmallHD Cine 13 is a compact, brilliantly bright, light, UHD 4K monitor.

This is the monitor most often seen on a stand in front of a focus puller or attached to the controls of a remote head. It's unobtrusive on crowded sets and small enough to fit inside a car or helicopter.

The Cine 13 was launched in June 2021. It weighs 6.8 lb. At 1500 nits, it is bright enough to view in full sunlight or in front of an 18K HMI.

There are four 12G SDI inputs and outputs, and one HDMI in and out. The rugged unibody aluminum chassis has an Arca-Swiss style rail at the rear to slide on a dual hot-swappable battery plate for Gold Mount or V-Mount batteries.

Two 2-pin locking connectors provide power for accessories.

Of course, SmallHD PageOS software is built in.

Cine 13 Monitor Specs

- Display: 13"
- Actual Diagonal: 13.3"
- Resolution: 3840 x 2160
- Brightness: 1500 nits
- Contrast: 1300:1
- Processing: 10-bit
- Backlight Type: Edge-lit LCD
- Gamut: 100% Rec.709
- LUTs: 3D LUT support
- SDI: 4x 12G-SDI in, 4x 12G-SDI out
- HDMI: 1x HDMI 2.0 in, 1x HDMI 2.0 out
- Power Input: 1x 4-pin XLR, 12-34 V DC in
- Power Draw: 36.7W (monitor only)
- For Accessories: 2x 2-pin locking power connectors
- Weight: 6.8 lb / 3.09 kg
- Dims: 13.2" wide x 10.1" high x 2.3" deep
                      (without feet and handle)
- VESA: attachment threads
- US$ 4,699.00
- *smallhd.com/products/cine-13*

SmallHD Cine 18 4K High-Bright Monitor

As a Focus Puller, you might crave something larger than your faithful Cine 7 or Cine 13 monitor. When focus gets more critical, you may want to look at more pixels and you might have chuckled at the magnifying glass attached to a Noga Arm on a Cine 7 Monitor at Cine Gear.

SmallHD introduced the Cine 18 4K High-Bright Monitor in April 2022. It addresses the sweet spot between the lightweight, portable Cine 13 and the larger Cine 24. As focus gets ever more critical (here's looking at you, Full Frame T1.4) more real estate on screen enables easier life in focus.

Dave Bredbury, Product Manager for CS Cine, explained, "The Cine 18 is a lightweight, rugged, daylight-viewable 4K monitor that fills the critical size gap between the Cine 13 and Cine 24 in the SmallHD 4K monitor line-up— highly portable, daylight-viewable, and adaptable."

Cine 18 is a UHD 4K high-bright monitor in a lightweight aluminum unibody chassis with an 18" edge-lit LCD screen. As with the Cine 13, there's an Arca-Swiss rail system at the rear for hot-swappable battery power, two 2-pin Lemo accessory power connectors, cheese plate mounting points and PageOS software.

If you output 4096 x 2160 4K 24p from a camera's SDI connector, will the monitor auto select 3840 x 2160 — or do you have to set the camera output or monitor input to UHD rather than DCI 4K ?

Dave Bredbury replied: "It is automatic—it adds letter-boxing to make the aspect ratio 16x9, and then downscales to UHD to fit the screen. If the user wants to see the image 1:1, they can use pixel zoom. The first pixel zoom will zoom just a smidge to make everything line up 1:1, which drops the left and right edges of the DCI 4K image."

So, here's a new monitor light enough to sit on set on a C-Stand, large enough for Video Village, bright enough to view in bright sunlight, that is intended for ACs, DPs, DITs, Directors, Producers and Clients.

Cine 18 Monitor Specs

- Display: 18"
- Actual Diagonal: 18.4"
- Resolution: 3840 x 2160
- Brightness: 1100 nits
- Contrast: 1300:1
- Processing: 10-bit
- Backlight Type: Edge-lit LCD
- Gamut: 100% Rec.709
- LUTs: 3D LUT support
- SDI: 4x 12G-SDI in, 4x 12G-SDI out
- HDMI: 1x HDMI 2.0 (4K60) in, 1x HDMI 2.0 out
- Power Input: 1x 4-pin XLR 12-34 V DC (210W max.)
- Weight: 12 lb / 5.05 kg
- Dims: 18.4"w x 12.7"h x 2.5"d (without feet and handle).
- VESA: attachment threads
- US $ 5,999.00
- smallhd.com/pages/cine-18

SmallHD Cine 24 4K High-Bright Monitor

SmallHD Cine 24 internally processing ALEXA 35 LogC4 video to Rec.709. Sam Fornasiero and Mike Sippel (L-R) at ARRIRental NY.

SmallHD's Cine 24 arrived in August 2020. Initially intended as nimble DIT and video village monitors, you see an increasing number of them showing up on innovative focus pullers' carts. The Cine 24 is even light enough to be mounted on a stand using the built-in VESA mount attachment points.

Whereas the Cine 13 and Cine 18 have a Rec.709 color gamut, the larger Cine 24 has 100% DCI P3.

Like the 13 and 18, the Cine 24 is a high-bright (1350 nits) UHD 4K 3840x2160 monitor.

The chassis is familiar, with an Arca-Swiss rail system at the rear for hot-swappable battery power and two 2-pin locking accessory power connectors.

Cine 24 Monitor Specs

- Display: 24",
- Actual Diagonal: 24.1"
- Resolution: 3840 x 2160
- Brightness: 1350 nits
- Contrast: 1000:1
- Processing: 10-bit
- Backlight Type: Edge-lit LCD
- Gamut: 100% DCI-P3
- LUTs: 3D LUT support
- SDI: 4x 12G-SDI in, 4x 12G-SDI out
- HDMI: 1x HDMI 2.0 (4K60) in, 1x HDMI out
- Power Input: 1x 2-pin XLR 12-34 V DC (210W max.)
- Weight: 16.5 lb / 7.5 kg
- Dims: 23."w x 15.8"h x 2.4"d (without feet and handle).
- VESA: attachment threads
- US $ 6,999.00
- *smallhd.com/products/cine-24*

SmallHD OLED 27 4K HDR Reference Monitor

SmallHD announced the OLED 27 4K HDR-Preview Monitor, in April 2022.

Although not a sibling of the Cine Monitor family, you will see it on the cart of discerning DITs and DPs, in grading suites and post-production facilities.

The SmallHD OLED 27 provides exceptional color accuracy, up to 550nits of brightness and a 1,000,000:1 contrast ratio in a rugged, lightweight body.

"We paid careful attention to our customers' desire for a set-to-suite OLED monitor built on the foundation of our existing product family" said CS Cine Product Manager David Bredbury. "That was the driving force behind the SmallHD OLED 27 in along with wish-lists for OLED color accuracy, increased brightness, exceptional contrast and field-tested reliability.

"The OLED 27 4K Monitor has exceptional color and contrast on a bigger, brighter screen for HDR monitoring on set or in the grading suite. We combined the best 27" 4K display available and protected it in our rugged, field-tested, set-ready, aircraft-grade aluminum unibody housing.

SmallHD's OLED 27 weighs less than 14 pounds. It has numerous ¼-20 mounting points for all kinds of power and accessory configurations.

As with all the SmallHD Monitors discussed here, the OLED 27 is compatible with Teradek Bolt 4K transmitters and receivers.

The latest PageOS 5 software is inside and includes familiar SmallHD tools: Waveform, Vectorscope, Monitor Calibration Wizard, Calman Calibration and, huzzah...Ed Lachman EL Zone.

Read all about EL Zone on the next page.

OLED 27 Monitor Specs

- Display: 27-inch OLED
- Actual Diagonal: 26.9"
- Resolution: 3840 x 2160
- Brightness: Up to 550nits
- Contrast: 1,000,000:1
- Processing: 10-bit
- Gamut :   110% DCI-P3 / 135% Rec. 709
- Dynamic Range: 12.3 stops
- LUTs: 3D LUT support
- SDI: 4x 12G-SDI in, 4x 12G-SDI out
- HDMI: 1x HDMI 2.0 (4K60) in, 1x HDMI out
- Power Input: 1x 3-pin XLR 12 - 34 V DC 12A max
- Accessories: 2x 2pin (12V / 2A combined) 1x USB (2.4A) 1x USB (1.5A) 1x USB-C (5V / 1.5A)
- Weight: 13.16 lb / 5.97 kg
- US $11,999
- *link.cs.inc/oled27*

EL Zone by Ed Lachman ASC & SmallHD Monitors with PageOS 5

EL Zone has been added to PageOS 5, a free software update for all SmallHD monitors. It was conceived by Ed Lachman, ASC and developed for SmallHD monitors by Creative Solutions.

EL Zone is like a spotmeter in your monitor. 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 or more stops. The ALEXA

35 (shown above), would over or under-expose after about 8 stops above and below 18% gray.

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, just look at the reference color chart and stops on screen.

EL Zone is intuitive and helpful.

PageOS 5

PageOS is SmallHD's operating system software. The latest PageOS 5 update is now available as a free software download. It includes Multi-View (up to cameras side by side, quad split, etc), calibration with Calman software, Lookaround Camera Control on all pages, Tetrahedral LUT interpolation—yes, it has the new ALEXA 35 3D Display LUTs—improved HD upscaling, and EL Zone exposure tool.

Calman Calibration

Connect a Calman Portrait Displays Colorimeter probe and a computer running Calman software to a SmallHD 4K monitor via Ethernet. The Calman software will auto-calibrate and upload a calibration LUT directly into the monitor.

EL Zone on SmallHD Monitors with PageOS 5

EL Zone

False-color is a confusing term. It's not false. It gives you an accurate zone system based on stops of exposure. EL Zone was invented by Ed Lachman, ASC and SmallHD has developed it, in collaboration with Ed into a monitor tool with specific colors for each stop above and below 18% grey. The colors are intuitive as a rainbow—remember ROYGBIV— to easily see exposure zones on the monitor without having to translate IRE values in useful T stops. If you can't remember ROYGBIV, there's even a legend of colors and corresponding T-stops.

Here are some screeengrabs, below, showing some of the steps to access EL Zone.

1. Add New Tool
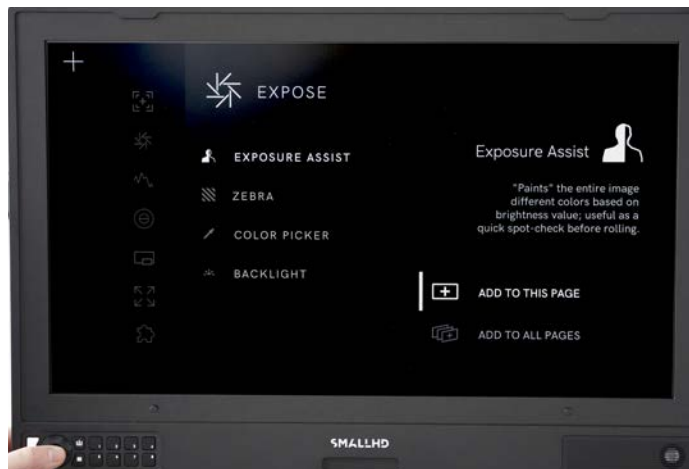
2. Exposure Assist > Add to this Page
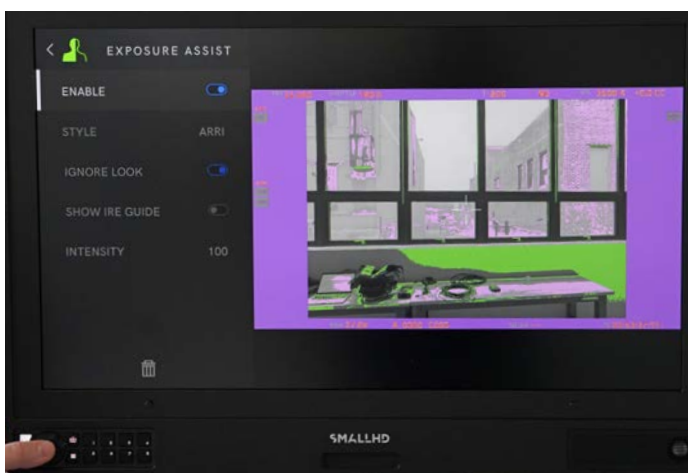
3. Enable

4. Style > EL Zone

5. Select

6. Position EL Zone reference legend

Teradek RT MDR.S Motor Driver

Teradek RT MDR.S is a tiny receiver+control unit to drive lens motors. I guess the "S" in MDR.S could stand for small or stylish. You can control a single motor or daisy-chain up to 3 motors—for focus, iris and zoom. Short cables minimize clutter.

At right: MDR.S connected to RT MK3.1 Brushless Lens Motor. The motor comes with thin, flexible cables. Gears are available in 0.8, 0.6, 0.5, and 0.4 width.

Plug lens motor in here. Daisy-chain up to 3.

Power: 5-28 V DC

6-pin serial connection to camera's serial port for camera start/stop from hand unit.
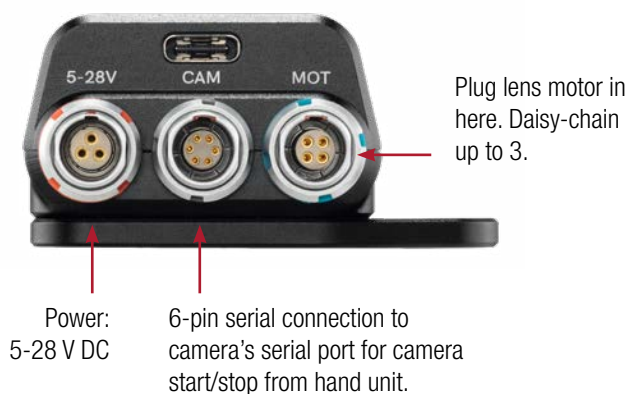
- The OLED display has a simple menu system.
- MDR.S is ridiculously lightweight: a mere 2.4 oz.
- Maximum line-of-sight range is 5,000 ft.
- 1, 2 or 3 channel (lens motor) control.
- Connects via FHSS (Frequency Hopping Spread Spectrum) wireless technology.

- The camera control port allows users to start and stop recording from your RT hand unit.
- The MDR.S also connects via Bluetooth for lens control via Teradek RT's app for iOS.
- Additional information: *http://tdek.co/fdt-mdrs*

Teradek RT Lens Control Kits

Teradek Single Channel Kit

Teradek Three Channel Kit

Teradek RT kits are now easier to describe and more affordable.

Here is a Single Channel Kit. Teradek's CTRL.1 single channel hand unit connects wirelessly to an MDR.S motor driver that connects by cable to one RT MK3.1 Brushless Lens Motor. Most likely you'll use this kit for focus.

The Teradek RT Three Channel Kit consists of one CTRL.3 (Focus-Iris-Zoom) Hand unit, one MDR.S and three RT MK3.1 lens motors.

Keep your eyes on the prize (the monitor). Stay with the money (the actress or actor).

When Teradek RT wireless focus systems are paired with SmallHD monitors, they now display a real-time overlay of focus, iris, and zoom settings on-screen along with additional lens data. This help alleviate ping-pong neck syndrome (from looking back and forth from focus knob to monitor.

The white triangles on the screen (above) is where focus and iris are set on the hand unit. The red triangle and red numbers are Teradek RT TOF.1, CineRT Focusbug, or CINE TAPE numbers. The purple and yellow narrow triangles are focus marks.

Lens motors require just a single cable that supplies power and signals—and daisy-chain between motors.

SIGMA 65mm Cine Primes

SIGMA 65mm T1.5 FF High Speed Prime

SIGMA 65mm T2.5 FF Classic Prime

Gordon Willis, ASC liked 40mm primes. Their angle of view closely matched they way we see things. That is the way he saw much of *The Godfather*, filmed in 35mm 1.85:1 format.

Even today, as a manufacturer, you risk great agitation from DPs lest you neglect to include a 40mm lens in your set of Super 35 primes.

But, to achieve the same way we see life in Super35 as Full Frame, we must multiply by 1.4. And so, a Super35 40mm equivalent angle of view in Full Frame is 65mm.

September 7, 2022. SIGMA Corporation CEO Kazuto Yamaki announces development of the SIGMA FF High Speed Prime 65mm T1.5 FF.

This is the 11th lens in SIGMA's FF (Full Frame) High Speed Prime lens series: 14, 20, 24, 28, 35, 40, 50, 65, 85, 105, 135 mm.

The SIGMA 65mm has been designed from scratch as a dedicated cine lens. Available in PL (with /i lens data), EF and E-mount.

SIGMA's Classic Prime 65mm T2.5 FF has the same optical designed as the 65mm T1.5 FF, but the elements are uncoated. This achieves both the high resolution that SIGMA Cine Lenses are known for, as well as a classic image expression—a look— with low contrast, beautiful flares and ghosting effects. With the 65mm T2.5 FF Classic Prime, there are now 11 SIGMA Full Frame Classic lenses, in the same focal lengths as the T1.5 FF High Speed series.

Oh, and a 40mm Full Frame prime gives you a similar angle of view as a Super35 28mm lens, another Gordon Willis favorite.

SIGMA 65mm T1.5 FF
High Speed Prime in EF Mount

SIGMA 65mm T1.5 FF
High Speed Prime in PL Mount

SIGMA 65mm T2.5 FF
Classic Prime in PL Mount

SIGMA 65mm T1.5 FF
High Speed Prime in E-mount

SIGMA 16-28mm F2.8 DG DN | Contemporary Zoom

SIGMA 16-28mm
F2.8 DG DN |
Contemporary

SIGMA 24-70mm
F2.8 DG DN |
Contemporary

SIGMA 16-28mm and 28-70mm DG DN | Contemporary taken with SIGMA 24-70mm F2.8 DG DN | ART

SIGMA's new 16-28mm F2.8 DG DN | Contemporary Wide-Angle Zoom Lens (above left) is almost the same size and weight as its companion 28-70mm F2.8 DG DN | Contemporary Zoom (above right). If the best lens is the one that's light and small enough to put in your jacket pocket, and has exceptional imaging quality, then the 16-28 is the wide zoom you'll want to join the 28-70 that was released last year.

Both lenses cover Full Frame and come in mirrorless camera Sony E-mount or Leica/ SIGMA/Panasonic L-Mount.

Two large-diameter aspherical lens elements, two additional aspherical elements and five FLD glass elements (with characteristics similar to fluorite) keep the lens light, small and suppress chromatic aberrations. The lens also achieves impressive image quality benefits from advanced digital correction capabilities of the SIGMA fp L, Sony alpha and other recent cameras.

The zoom mechanism is internal. That means it does not trom-bone in and out. The overall length remains consistent throughout the entire zoom range. This constant center of gravity is helpful for work on gimbals and drones. A front filter thread is also helpful and not always found on wide lenses. Focus is fast, silent and accurate. A stepping motor controls the AF actuator.

Specifications

- Lens Construction: 11 groups, 16 elements (5 FLD, 4 Aspherical)
- Angle of view: 107.0° – 75.4°
- Aperture / Iris blades: F2.8 – F22 / 9 (rounded)
- Minimum focusing distance: 25 cm / 9.9 in.
- Maximum magnification ratio: 1:5.6
- Front Filter size: 72mm Ø
- Dimensions (Max. Diam. x Length):   77.2 Ø x 100.6mm
                                        3.0 Ø x 4.0 in.
- Weight (for L-Mount version) :   450g / 15.9 oz.
  Weight and length is for the L-Mount version.

SIGMA 16-28mm F2.8 DG DN | Contemporary
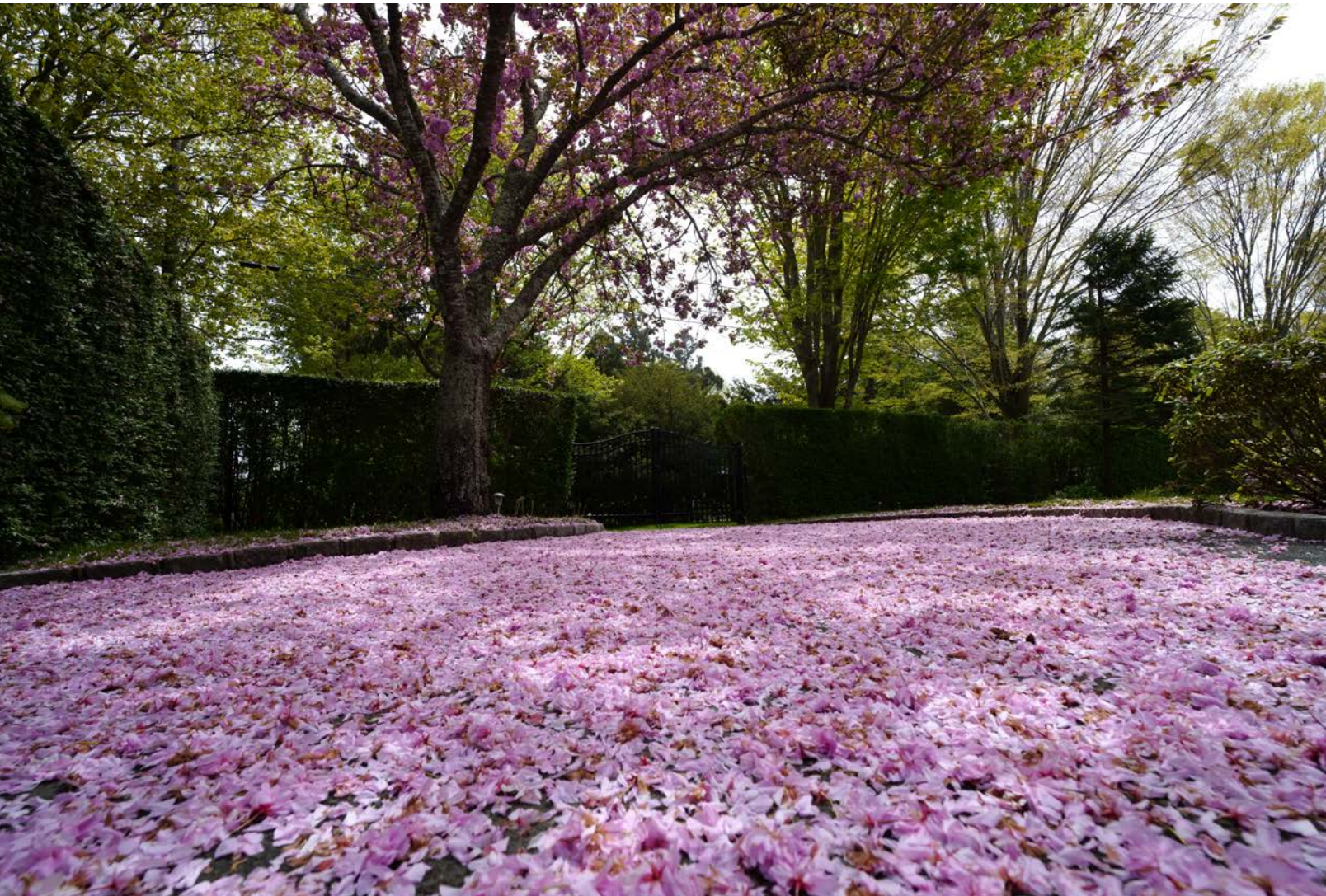
SIGMA 16-28mm F2.8 DG DN | Contemporary at 16mm wide end, 1/1250 sec, F8, ISO 800, 9520×6320.

In video mode, Screengrab function of SIGMA fp L shows user-definable framelines, frame rate, shutter angle, white balance, timecode, exposure and other information. This is a valuable tool when scouting, using the fp L as a Director's Finder, and for scene continuity.

SIGMA 20mm and 24mm F1.4 DG DN | Art Primes

The Robert Lehman Wing at the Metropolitan Museum of Art. Photo with SIGMA fp L and new 24mm DG DN Art lens.

August 8, 2022. SIGMA introduced 20mm F1.4 and 24mm F1.4 wide-angle, DG DN | Art lenses for Full Frame mirrorless L-Mount and E-mount cameras.

The SIGMA 20mm F1.4 DG DN | Art is the only AF interchangeable lens, as yet, for mirrorless cameras with a maximum aperture of 1.4 and an ultra-wide angle of 20mm for 35mm Full Frame.

The SIGMA 24mm F1.4 DG DN | Art offers similar, superb optical performance with 17 elements in 14 groups, including two FLD, one SLD and four aspherical glass elements. SIGMA writes, "Thanks to an optimal placement of each single part, the use of complex aspherical glass elements, the freedom afforded by the short flange back distance and a fierce fight for every single gram, the lens comes at an astonishingly small size and weight despite its wide viewing angle and large maximum aperture without any compromise of its optical qualities. With its handy dimensions, the 24mm F1.4 DG DN | Art is easy and convenient to use in any given situation, from travel and street photography to night-time photography."

Add to those situations an excursion to study *Study of a Young Woman* by Johanees Vermeer with SIGMA fp L and 24mm F1.4 DG DN | Art in the art collections of the Metropolitan Museum of Art. See article beginning on the next page.

SIGMA DG DN | Art prime lenses, l-r: 20mm F1.4, 24mm F1.4, 35mm F1.2, 35mm F1.4, 85mm F1.4, 105mm F2.8 Macro

Study of a Young Woman.
Johannes Vermeer.   ca. 1665–67
Oil on canvas. 17 1/2 x 15 3/4 in. (44.5 x 40 cm)
Photos by Jon Fauer with SIGMA fp L and 24mm F1.4 DG DN | Art

Lighting with Paint and Diffusion

Girl with a Pearl Earring. Johannes Vermeer. 1665. Oil on canvas. 15.35 x 17.52 in (39 x 44.5 cm). Mauritshuis, The Hague.

The year is 1666. It is the twilight of the Dutch Golden Age. For almost a century, the Dutch Republic has been one the most advanced maritime, economic and scientific societies in the world—with a population of only two million people.

The Dutch Empire stretches from Amsterdam to Asia. It dominates many of the trade routes to the Americas, including New Amsterdam (New York), and has a monopoly on access to Japan.

Art in the Dutch Golden Age is defined by the thriving middle class. Art is no longer under the patronage of the church, aristocracy and super wealthy. Merchants and patrons influence a new style of painting landscapes, still lifes, portraits, satirical views of everyday life, and tronies. For a century, the Dutch Golden Age has supported more than a thousand artists, including Rembrandt, Jacob van Ruisdael, Frans Hals, Pieter de Hooch, and Johannes Vermeer.

It is a wet, cold, and miserable day outside the studio in Delft. Johannes Vermeer, NSC (Netherlands Society of progenitorial Cinematographers) is agonizing over which filter to use today on his latest work, *Study of a Young Woman.* Promist or Glimmerglass, Black Promist or Pearlescent, Black Satin or Warm Promist, that is the question. How is a young artist to choose?

Vermeer has been busy recently. He has wrapped *Girl with the Pearl Earring, Woman Holding a Balance, Woman with a Water Jug,* and *A Lady Writing a Letter.* Today it's *Study of a Young Woman.*

"Props! Where's that pearl we used on the *Girl with the Pearl Earring*?" Vermeer bellows across the set.

"The brat took it home with her," mutters the stylist, pushing the prop master aside. "And props, stay in your own department."

"Then get another pearl and find a turban that's yellow-ish, not lapis lazuli ultramarine. And get the Tiffen Glimmerglass filter.

Meanwhile, Gaffer Pieter de Hooch is calling for additional crew. The soft, diffuse, cloudy-bright white available light coming through a single window that worked so well for *Girl with the Pearl Earring* is not available today. It is dark and rainy outside.

"Call the rental house and get two ARRI Orbiters with Open Face 60 degree Optics. Bounce them into a 20x20 Rosco Cinebounce twenty feet away and put a 12 x12 Rosco Light Grid Cloth frame six feet from the window," de Hooch instructs.

"Menheer Vermeer, here's the Tiffen Glimmerglass you requested" says the Camera Assistant.

Vermeer holds the filter up and scowls. "We're doing a close-up. This is a number 1 Glimmerglass, which may look good on a wide shot. But this is a close-up with a longer lens. So, we drop down to a lighter grade filter. Let's see the 1/8th Glimmerglass."

It's 2022 and three hundred fifty-seven years later, Vermeer's *Study of a Young Woman* is not in its usual place at the Metropolitan Museum of New York. Where could she be? In panic, I race downstairs to the information desk. Aging skylights in Gallery 964 are being replaced. She's moved to the Lehman Wing of Dutch Masters. I'm here to test an assortment of Tiffen filters on this painting—in addition to the slight haziness that Vermeer created. It would be nice to try the filters with a real model who must not move one centimeter despite the fumbling and futzing involved in quickly changing from one filter to the next. So, how about a motionless model, a masterpiece?

Like *Girl with a Pearl Earring,* this painting is probably a tronie, the portrait of an unidentified person, often in exotic wardrobe, expressing emotions and character. Tronies were usually sold on the open market and not commissioned by someone in advance.

Admittedly, some of the vintage look is caused by cracking and fading. But *Study of a Young Woman* appears softer than *Girl with a Pearl Earring.* Vermeer's filtration adds a smoother look that softens the piercing gaze of the young woman's stare.

It is pretty clear that Vermeer used lenses and diffusion filters, along with optical devices, mirrors and a camera obscura in his work. See David Hockney's *Secret Knowledge: Rediscovering the Lost Techniques of Old Masters,* architecture professor Philip Steadman's *Vermeer's Camera: Uncovering the Truth Behind the Masterpieces,* and the film *Tim's Vermeer.*

Tiffen's *Vermeer* filters follow on the next pages. These diffusion filters add character to your tronies and films, from sensual, silky-smooth skin tones to glowing specular highlights, in degrees of density for looks that range from subtle to deliberate. Eight variations of filtration are presented. There are many more. Each filter comes in round and rectangular sizes, with grades often ranging from 1/16 to 4—the higher the number, the stronger the effect. Each one does different things to define unique looks, create texture, glow highlights, smooth skin tones, and add character to the character or scene in front of your camera.

Describing looks and filters is like describing fine wines or writing about a visit the art museum. So here we are, in the museum, in front of Vermeer. Your artistic look may vary, depending on lighting, style, camera, lens and filter choices.

Pristine, clear filter. All photos taken with Photo with SIGMA fp L, new 24mm DG DN | Art lens, and Tiffen 72mm screw-in front filters.

Tiffen Pro Mist 1. Milkier background, muted white dress, pastel colors. Highlights not seen here would glow. Vermeer would have used a 1/8.

Tiffen Glimmerglass 1. Remains sharp; slightly muted whites, smooth skin tones. Highlights less glow. Also comes in Black Glimmerglass.

Tiffen Pearlescent 1. Silky smooth, pearly skin tones. Slight softening. A bit of glow around lights in shot. Also comes in Black Pearlescent.

Tiffen Black Pro Mist 1. Less intense than regular Pro Mist. Skin tones slightly softened, highlights would have less glow. Great for portraits.

Tiffen Warm Pro Mist 1. Combines Pro Mist diffusion with the warming effect of an 812 filter.

Tiffen Black Satin 1. Smooths skin tones and wrinkles. Whites and highlights are more vivid. Glowing highlights. Also in regular Satin.

Tiffen Smoque 1. Safer and gentler on your lungs than a smoke or fogging machine on set.

Blackmagic Cloud Storage

Three Blackmagic Cloud Storage Devices

Cloud Store
20, 80, 320 TB

Cloud Store Mini 8TB

Cloud Pod

Blackmagic has three new devices ready for your files: Cloud Store, Cloud Store Mini and Cloud Store Pod. Think of them as Network Attached Storage (NAS) devices that sync seamlessly with DaVinci Resolve, Dropbox or Google Drive, and all users working concurrently on a project.

Cloud Store and Cloud Store Mini have internal NVMe (nonvolatile memory express) flash memory storage. NVMe drives can read and write data up to 3.5 GB/s. Compare that to a USB-C connected SSD which has a data rate of about 550 MB/s and that is one of the reasons why the Cloud Store Mini costs a bit more than the Cloud Pod with an off-the-shelf external 8TB SATA SSD.

NAS devices are "just" boxes with hard drives inside. An Ethernet port on the box shares files across your local network, secured from the outside world, or connected to the internet.

Blackmagic Cloud Storage devices take network storage to a more productive level. They enable multiple users to work on the same project at the same time on separate DaVinci Resolve workstations in different places.

For example, camera original files are loaded onto Blackmagic Cloud Storage devices, which are synced with a Dropbox or Google Drive account. Editing and grading can begin immediately at the post production facility. Meanwhile, back at the set, director, DP and crew and see the results in real time.

Or picture this in post. Editor, colorist, mixer, producer, director and creatives can all see the same project progressing at the same time from different places.

Post Production Suite

Mac Studio

Blackmagic Cloud Store

DropBox

On Set / Near Set Editor

MacBook Pro

Cloud Store Mini
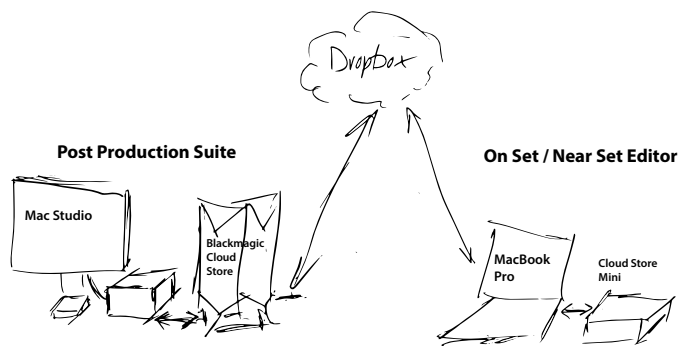
Here's a simplified example of how it works. In the Post House, camera original files or proxies are loaded onto a Blackmagic

Cloud storage device. It is connected by Ethernet cable to a Mac Pro running DaVinci Resolve 18 and the free Blackmagic Cloud app. Log in and pay a mere $5 per project library per month. You can have multiple projects in each project library. And you can cancel or suspend at any time. Use the Cloud app to set up sync from the files in your local Cloud Store to your Dropbox or Google Drive account. Your files are now ready to make the round trip quickly and securely to and from computer to Drobox cloud.

The editor on set or near set has a MacBook Pro connected to a Blackmagic Cloud Store Mini. Any edit, grade or change made by either user is updated immediately to the other via Dropbox or Google Drive. And so, Blackmagic Cloud storage devices continuously update the Dropbox or Google Drive "cloud" files in real time to stay in sync. And then, the files are updated on the local storage devices. This is much faster than working "live" over the Internet since DaVinci Resolve is working with local files.

Of course, additional team members can work without the cloud storage hardware, simply syncing the Dropbox or Google Drive project and media files with the Blackmagic Cloud app.

The latest DaVinci Resolve 18 lets you work on project files that are located on your internal drives, directly connected drives, network attached drives, cloud storage or the new Blackmagic Cloud Storage devices.

DaVinci Resolve 18

For good reason, there's only one ship's captain navigating uncharted waters. You, the editor or colorist, might be equally appalled by the prospect of multiple people messing with your timeline or grade. Even though different people can work via Blackmagic Cloud on the same project, DaVinci Resolve 18 ensures that you only can see, approve and apply other people's changes.

Blackmagic Proxy Generator

Blackmagic Proxy Generator comes free with DaVinci Resolve.

- Select your camera original files
- Specify what kind of proxies to create (H.264 8-bit 4:2:0 ½ res; H.264 -8-bit 4:20 1080p; H.265 10-bit 4:2:0 1080p or ProRes 422 10-bit 4:2:2 1080p)
- Identify watch folder destinations.

Proxies are generated automatically and DaVinci Resolve links them to the original media files.

Blackmagic Cloud Storage

Blackmagic Cloud Store

This is the top of the line device, with 20 TB, 80 TB and 320 TB storage inside a Blackmagic eGPU syle housing with a silent fan.
- RAID 5 flash memory.
- Sync to Dropbox.
- HDMI output to monitor storage status.

- Four 10G Ethernet ports with built in switch.
- Supports Ethernet over USB-C connection to computers.
- Two USB-C ports for local input and backup of files.
- 20 TB (US $9,595), 80 TB (US $29,995) and 320 TB (built to order).

Blackmagic Cloud Store Mini

Compact half rack size, rack mountable, with silent fan.
- Four internal M.2 flash memory cards for 8 TB storage.
- RAID 0 configuration.
- Sync to Dropbox.
- HDMI output to monitor storage status.

- One 10G Ethernet and one 1G Ethernet port.
- Supports Ethernet over USB-C connection to computers.
- USB-C port for local backup of files.
- US $2,995,

Blackmagic Cloud Pod

Compact device that connects your existing, external USB-C drives.
- Provides affordable high speed network storage.
- Two USB-C ports to connect external USB-C drives.
- Hardware acceleration.
- Sync to Dropbox.

- HDMI output to monitor storage status.
- One 10G Ethernet port.
- US $395

Blackmagic Cloud Storage

Cloud Store Mini 8TB

Mac Studio

USB-C

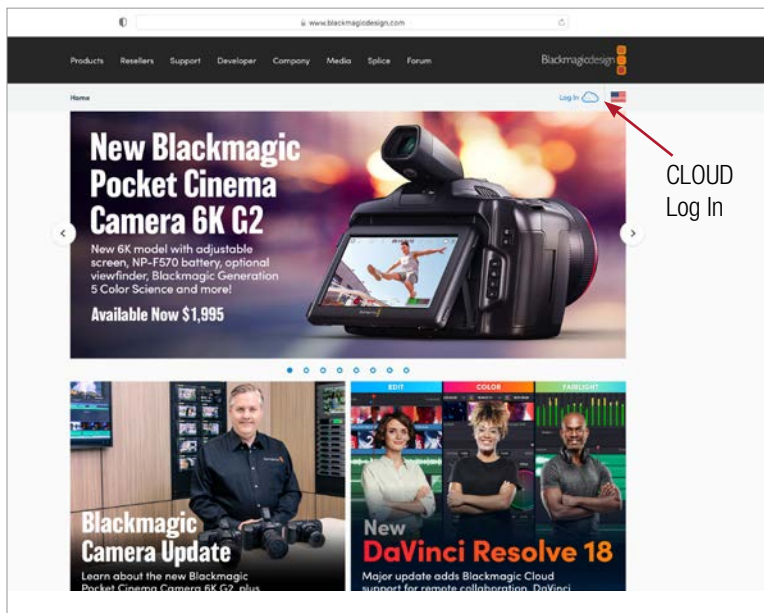| Power | 1 GB Ethernet | HDMI Monitor | Ethernet | Power |

1. Connect Cloud Storage Device to Computer. In this example, a Mac Studio connects to Cloud Store Mini 8TB.

CLOUD
Log In

2. Go to *blackmagicdesign.com* and click on the CLOUD icon, upper right.
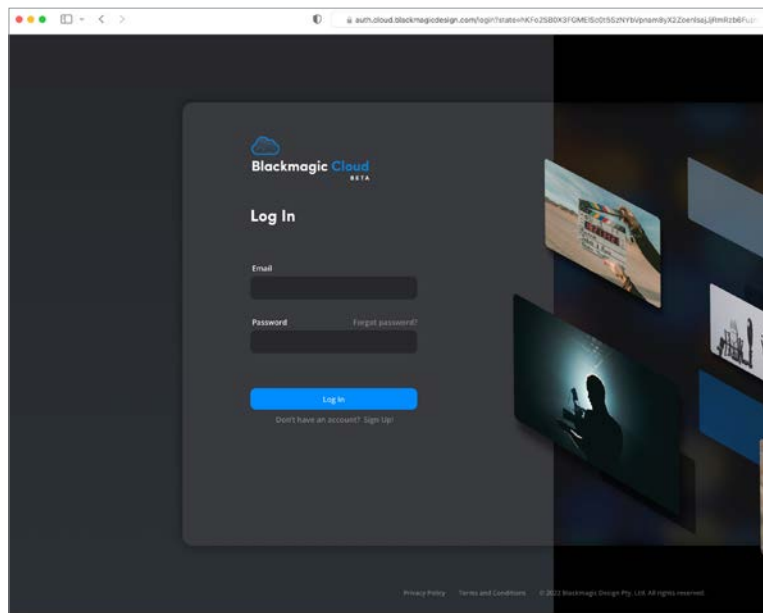
3. Or go directly to: *cloud.blackmagicdesign.com/apps*

Blackmagic Cloud Storage
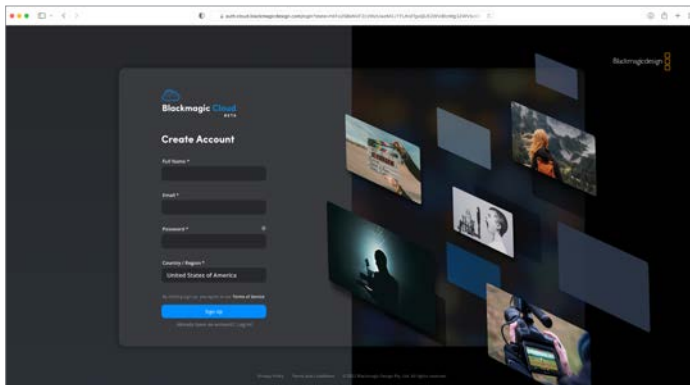
4. Log in or Create Account for Blackmagic Cloud.
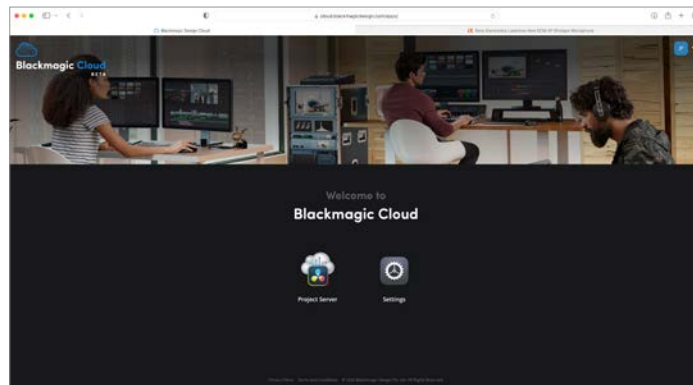
5. Welcome to Blackmagic Cloud.

6. If you have a recent Mac Pro, Mac Studio, MacBook or computer with 10GB Ethernet, connect via the 10GB Ethernet port. This will speed up transfers from computer to the Cloud Store device and its drives.

Connect the MONITOR OUT port via HDMI cable to a monitor for a helpful honeycomb style view of storage levels and activity.

Also, important for setup, connect the Cloud Store's USB port to the computer if you cannot set up the Cloud Store Mini 8TB using an Ethernet cable.

7. Next, download and install the Blackmagic Cloud Store Setup app. It's on the Blackmagic Support web page under Network Storage: *blackmagicdesign.com/support/family/blackmagic-cloud-store*
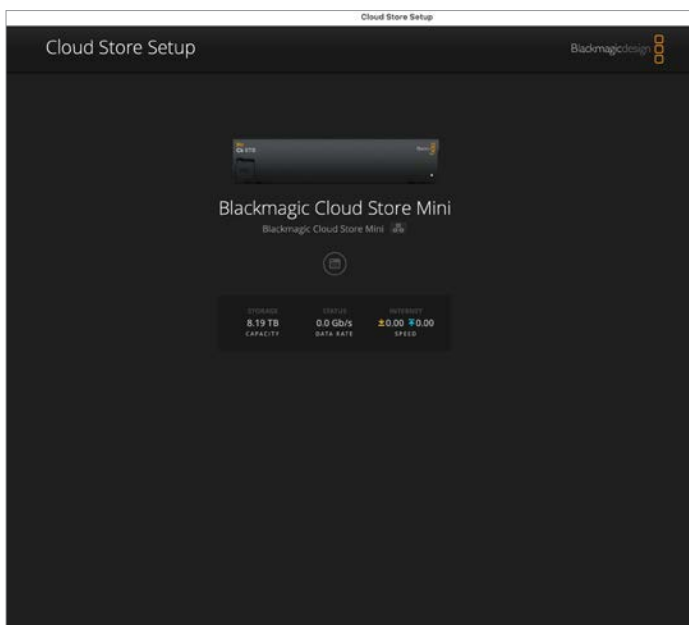
8. Open the Blackmagic Cloud Store Setup app. In this example, we're connected to a Cloud Store Mini 8TB. Click on the image or the menu icon in the circle at the center of the screen.
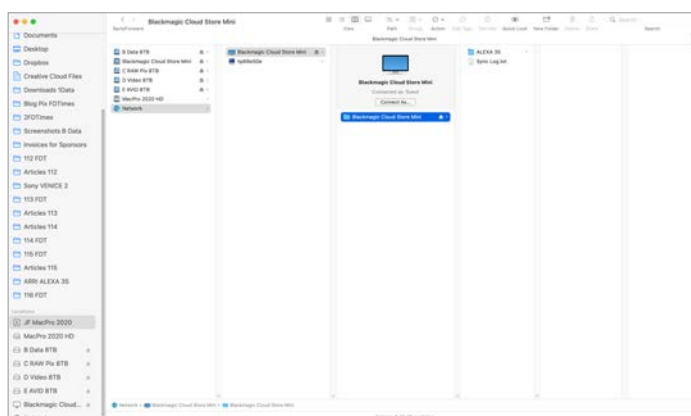
9. To enable and view network access on a Mac computer:
  • Open Finder and click on NETWORK in the sidebar.
  • Double click on Blackmagic Cloud Store Mini (in our example).
  • Double click on the internal or connected drive.

On a Windows computer:
  • Click on NETWORK in the File Explorer sidebar. You will see your Blackmagic Cloud Store listed.
  • Double click on your Blackmagic Cloud Store. A Windows security dialog box pops up asking for network credentials.
  • Set the username and password to GUEST. Click OK.

Blackmagic Cloud Storage
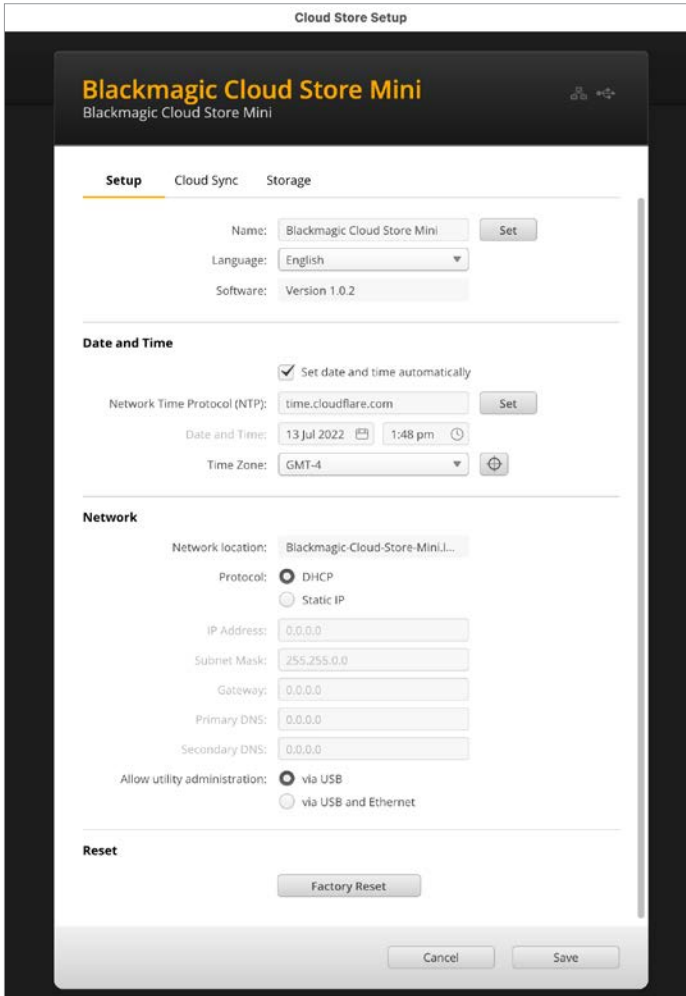
10. In the Setup screen, be sure your time zone is correct. If you cannot click the drop-down time zone menu, chances are that you have not connected the Cloud Store device via USB-C to your computer.

Click SAVE.
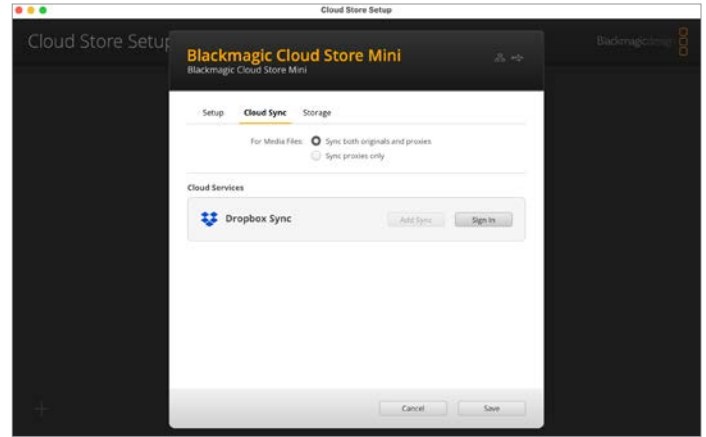
11. Open the next tab, Cloud Sync. Select whether you want to sync originals and proxies, or only proxies. We like both originals and proxies. Then, click on Dropbox Sync Sign in.
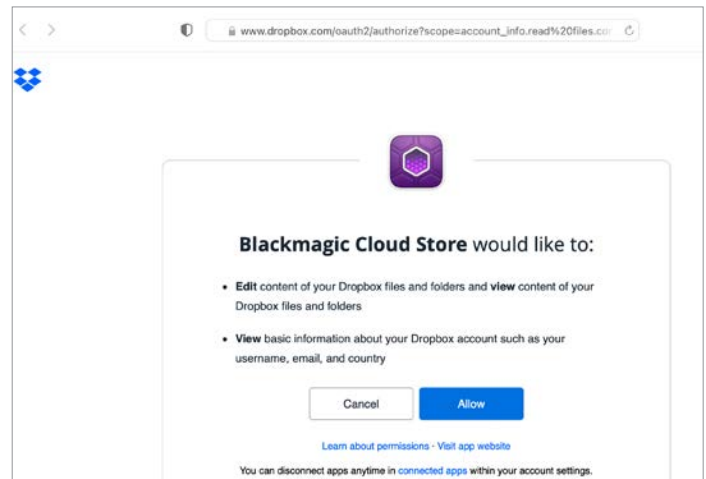
12. Your browser will open, asking for permissions to sync your Dropbox with Blackmagic Cloud Store. ALLOW.
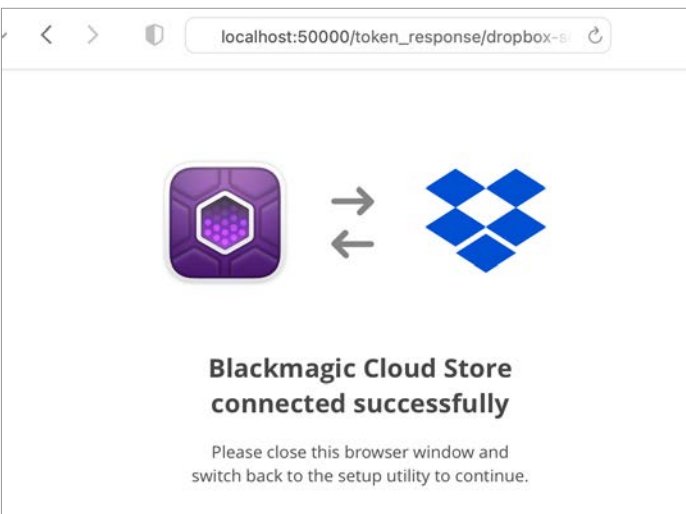
13. Dropbox is now connected and synced to Blackmagic Cloud Storage.
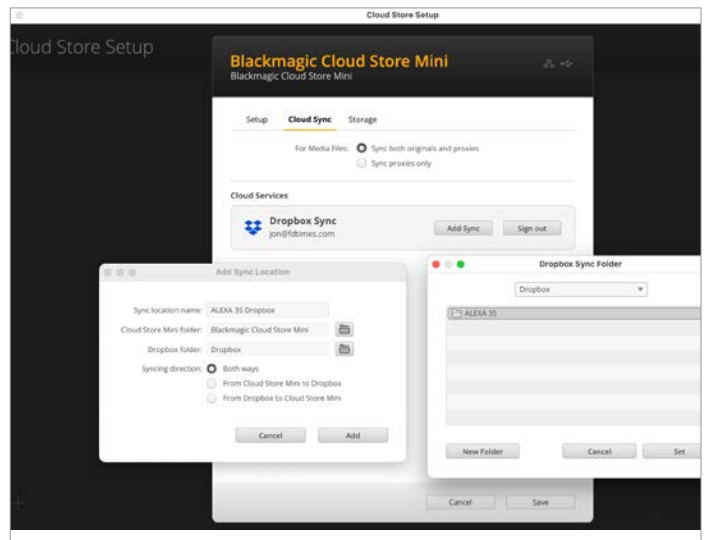
14. If it didn't open automatically, click the Add Sync button. Name your Sync Location and where you'd like to find the files in both Dropbox and on the Cloud Store or Cloud Store Mini 8TB internal drive. (If you're using the Pod, the folder will be on an attached SSD.) Click SAVE.

Blackmagic Cloud Storage
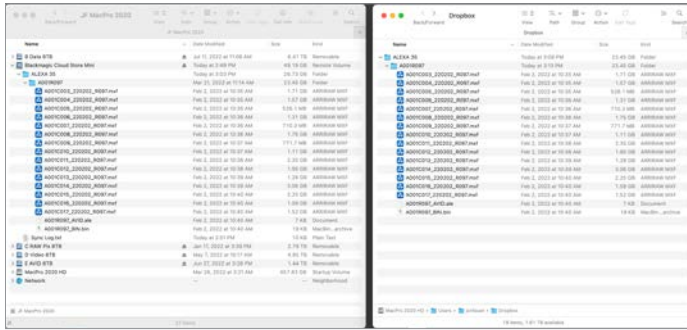
15. In this Finder view, the files on the internal SSD of the Cloud Store Mini 8TB are at left. The Dropbox files are at right. They are in sync and automatically update.
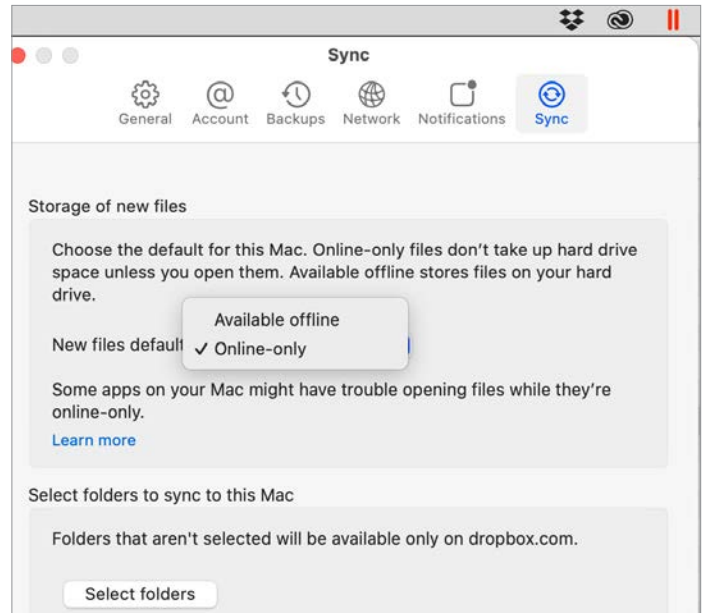
16. You can select whether Dropbox files are stored only in the cloud (on Dropbox remote servers) or locally (offline) and remotely (online). Go to Dropbox preferences on your computer > Sync > Storage of New files
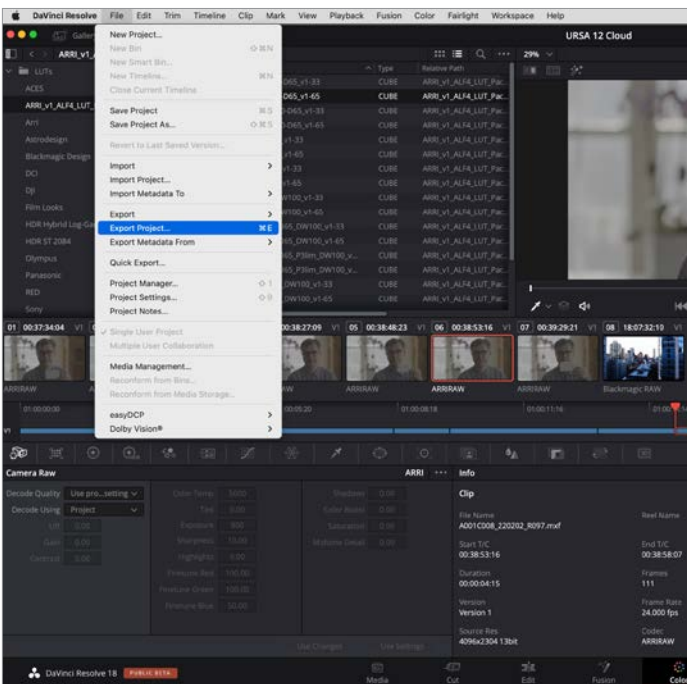
17. Share the DaVinci Resolve project with, for example, a colorist: select File > Export Project...and save it to your Project's Dropbox folder.
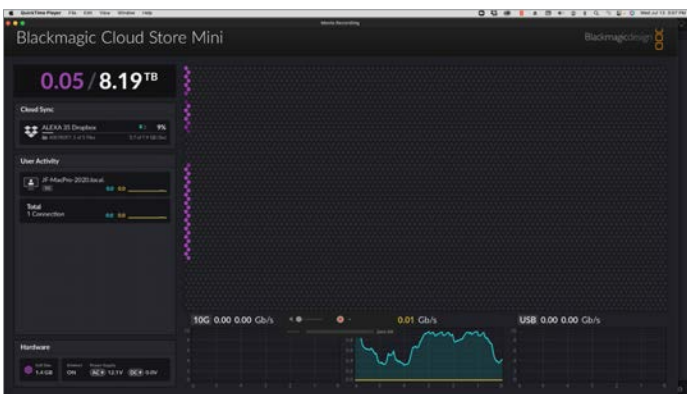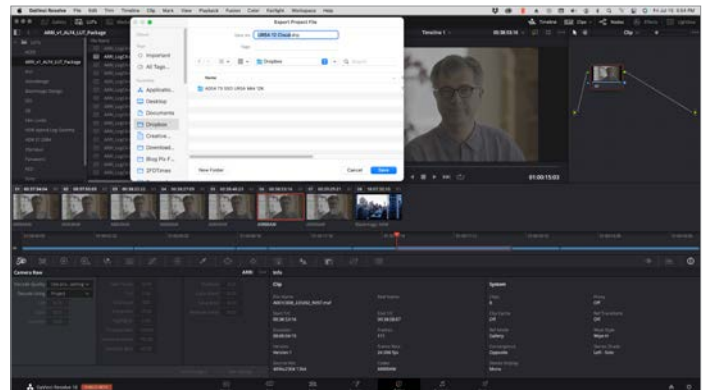
18. The HDMI output to a monitor gives you a nice beehive view of storage, progress and activity.

19. Watch Grant Petty's in-depth video demo of Cloud Store, also on the Blackmagic Support web page under Network Storage: *blackmagicdesign.com/support/family/blackmagic-cloud-store*

Canon 20-50 & 45-135 T2.4 Full Frame Flex Zooms

On April 12, 2022, Canon announced: "the launch of a new series of lenses for the company's EF Cinema Lens lineup — the Flex Zoom Lens series." And then they said: "The first lenses in the series are the CN-E20-50mm T2.4 L F/FP wide-angle zoom lens and the CN-E45-135mm T2.4 L F/FP telephoto zoom lens."

Does "first lenses in the series" mean that more Full-Frame Zooms are on the way? I would guess yes and look forward to whatever comes next.

You won't have to flex your muscles to work with these new Canon Flex Zoom Lenses. They are very light (less than 7.5 lb / 3.4 kg). They are very compact: shorter than 9.7" / 246.4 mm. And they are amazingly fast for compact Full-Frame zooms with

a T2.4 maximum aperture for both, without ramping.

The Flex zooms come in EF or PL mount, designated by the product name of F for EF, and FP for PL. The EF mount provides electronic shading and chromatic aberration correction when used on Canon's EOS R5 C with an EOS RF-to-EF mount adapter. The R5 C also will display Flex zoom lens data (focal length, aperture and focus distance) as well as Manual Focus Guides (green arrows to guide you in to sharp focus.) Various permutations of these EF mount features are available on other Canon EOS Cine cameras now or with firmware updates.

The PL (FP model) mount has a standard 4-pin external /i LEMO connector on the camera right rear side of the barrel

Canon 20-50 T2.4 Flex Zoom

CN-E 20-50mm EF Left

CN-E 20-50mm PL Left

CN-E 20-50mm EF Top

CN-E 20-50mm PL Top

CN-E 20-50mm EF Right

CN-E 20-50mm PL Right

and four /i electrical contacts at the standard 12 o'clock position of the lens mount itself. I believe you will be able to swap lens mounts back and forth relatively easily.

The Canon CN-E20-50mm T2.4 L F/FP and CN-E45-135mm T2.4 L F/FP telephoto zoom lenses have an estimated retail price of $21,999.00. (Specifications, availability and prices are subject to change without notice.)

You may be wondering why the Flex Zooms come in EF mount and not RF. Didn't Canon Chairman and CEO Fujio Mitarai announce in March 2022 that 32 new RF lenses are on the roadmap? I guess the reason for EF is compatibility with the hundreds of thousands of EF cameras out there.

To attach a Flex Zoom to your Canon R5 C, R5, RED V-RAPTOR or other RF mount camera, all you need is one of several inexpensive and very rugged Canon RF-to-EF adapters. The EF lens data is passed through the contacts in the adapter to the RF camera.

You can certainly use Canon Flex Full-Frame zooms on Super35 cameras. Remarkably, these new lenses are faster (T2.4) than the current line of Canon CN-E Compact 15.5-47mm T2.8 L and 30-105mm T2.8 Super35 Zooms.

Both the Full Frame Flex and Super35 CN-E Compact Zooms have 114 mm front diameters. Length is similar. Weight of the Super35 Compacts is about half, at 4.8 lb.

Prices for the Super35 Compact Zooms models are also about half—at $9,999 compared to $21,999 for the new Full Frame Flexes. I trust you are not calculating price per millimeter of extra image diagonal and faster aperture.

Canon representatives explained that the faster apertures of the Canon Flex Full Frame Zooms in a lens barrel of similar size as the Super35 counterparts are possible because of the latest innovations in technology and optical design.

Canon 45-135 T2.4 Flex Zoom

CN-E EF45-135mm Left

CN-E PL45-135mm Left

CN-E EF45-135mm Top

CN-E PL45-135mm Top

CN-E EF45-135mm Right

CN-E PL45-135mm_ Right

EF Mount electronic contacts

CN-E EF-45-135mm Rear
EF Mount. Electronic contacts are the the 6 o'clock position.

PL mount /i lens data contacts

4-pin LEMO connector with /i data

CN-E PL45-135mm Rear
PL mount. The /i lens data contacts are in the standard 12 o'clock position with a redundant 4-pin LEMO connector for external /i data capture.

Canon 20-40 and 45-135 T2.4 Flex Zooms

CN-E20-50mm EF Front

CN-E EF45-135 Front

Specifications

CN-E20-50mm T2.4 LF (EF Mount) / FP (PL Mount)

- Focal Lengths: 20-50mm
- Range: 2.5x
- Maximum Aperture: T2.4
- Iris Blades: 11
- Focus Rotation: 300 degrees
- Minimum Focus: 2' / 0.6 m
- Front Diameter: 114 mm
- Length: EF: 9.5" (241.3 mm) / PL: 9.2" (233.3 mm)
- Weight: 7.3 lb / 3.3 kg
- Lens Metadata: EOS EF Lens Communication or PL /i Technology
- approximate retail price of $21,999.00.

CN-E45-135mm T2.4 L F (EF Mount) / FP (PL Mount)

- Focal Lengths: 45-135mm
- Range: 3x
- Maximum Aperture: T2.4
- Iris Blades: 11
- Focus Rotation: 300 degrees
- Minimum Focus: 3'4" / 1.0 m
- Front Diameter: 114 mm
- Length: EF: 9.7" (246.4 mm) / PL: 9.4" (238.4 mm)
- Weight: 7.5 lb / 3.4 kg
- Lens Metadata: EOS EF Lens Communication or PL /i Technology
- approximate retail price of $21,999.00.

Canon EF to RF Adapters

Front side of Canon Drop-In Filter Mount Adapter EF-EOS R
with Drop-In Variable ND Filter A

Front side   Rear side

As discussed earlier, to attach an EF Mount Flex Zoom to an RF Mount camera, several inexpensive and rugged Canon RF-to-EF adapters are available. The EF lens data is passed through the contacts in the adapter to the RF camera.

Canon RF-to-EF adapters are available plain, with Variable Neutral Density filters (VND) or a circular polarizer.

Canon offers these three RF to EF adapters:

- Standard EF-EOS R.
- Control Ring Mount Adapter EF-EOS R.
- Drop-In Filter Mount Adapter EF-EOS R with Drop-In Circular Polarizing Filter A

The Canon Drop-In Filter Mount Adapter EF-EOS R with Drop-In Variable ND Filter A is shown at left.

Note: there are 12 contacts on the RF side of the mount and 8 pogo pins on the EF side.

Also note: When ordering, please remember that Canon's official product terminology is EF-EOS R: lens side comes first.

FDTimes and RED have been calling it RF-EF: the camera end comes first.

Claudio Miranda, ASC on *Top Gun: Maverick*

Claudio Miranda, ASC ground to air. Photo: Scott Garfield. © 2022 Paramount Pictures.

Jon Fauer: The last time we spoke, you were prepping *Top Gun: Maverick*. I remember you were asking Mr. Yamaki, CEO of SIGMA, to add /i lens data into SIGMA High Speed Full Frame Cine lenses.

Claudio Miranda, ASC: I remember becoming frustrated because I was using SIGMA E-mount lenses that included Sony lens metadata. But when SIGMA Full Frame Cine primes came out, they didn't have lens data. And so, they were kind enough to add it back in for me because I like to see focus distance and T-stop in the eyepiece or on the monitor.

Because of you, SIGMA added /i lens data to all subsequent models of T1.5 High-Speed Full Frame PL mount primes.

We were looking at a bunch of lenses during tests for *Top Gun: Maverick* and we gravitated toward these SIGMA lenses based on some stills that we saw earlier on. But in truth, *Top Gun: Maverick* used a bunch of lenses. The list is kind of crazy.

Danny Ming, Top Focus puller, sent the list: "SIGMA FF High Speed PL mount primes, Master Primes from 65mm and longer to cover Full Frame, Voigtlander and ZEISS Loxia E-mount primes in the cockpit; 28-100 FUJINON Premista FF zooms; FUJINON Premier 18-85, 24-180, and 75-400 zooms with IB/E Optics Extenders; Canon 150-600 (FF modified still lens). The aerial and Shotover unit used 20-120, 85-300, and 25-300 FUJINON Cabrios."

The camera and lens list is long. We mixed it up a little bit.

As Admiral Cain, played by Ed Harris, asked, "Why is that?"

"It's one of life's mysteries." Seriously, Joe Kosinski, our Director, wanted to shoot Full Frame. SIGMA covered the wide end, and the Master Primes covered the long end. We were using the SIGMAs from 14mm to 50mm. The Master Primes in

those focal lengths don't cover Full Frame. But the 50, 75, 100 and 150mm Master Primes do cover Full Frame. In terms of sharpness and resolution, they're pretty close. In grading, even if things are just a little bit off, you can kind of blend them all in.

Life's other mystery, then: why did you have Super35 zooms?

We were shooting in Full Frame sometimes. But our zooms, with the exception of the FUJINON Premistas, were mostly the FUJINON Premier series, which are Super35. A lot of that was for ground-to-air on really fast moving planes going through the mountains, or just when we needed to carry a small lens package that had a greater range. For example, if you go in a helicopter, you want to carry one lens. Full Frame zooms are great, but they generally don't have the long range of the Super35 models.

The FUJINON Premier zooms cover Super35, not Full Frame. But they are incredibly sharp and Super35 format on the VENICE cameras is still 4K. We were in 6K for all the Full Frame scenes. Of course, the film was released in 4K.

The interior of the jets were covered with Voigtlander and ZEISS Loxia E-mount, manual focus and manual iris still photography lenses. We used them because their small size allowed us to get them inside the jets. We had the VENICE cameras in Rialto mode: camera head tethered to the camera body. But we couldn't fit the RAW recorders in the jet cockpits so we recorded everything in XAVC 4K Full Frame onto SxS cards.

So, you removed the PL Mount from the VENICE cameras?

To be as compact as we could, even SIGMA E-mount photo lenses would've been too big, believe it or not. We really had inches to work with, in very little space. The cameras had to allow clear ejection points for the pilot, and nothing could

Claudio Miranda, ASC on *Top Gun: Maverick*

Monica Barbaro and Tom Cruise in cockpit with VENICE cameras. Photo: Scott Garfield. © 2022 Paramount Pictures Corporation.

protrude in front of the control panel of the dash or beyond the glare shield. Not even by a quarter inch. We even had to shave off parts of the lenses just to make room.

We couldn't add ND filters in front of the lenses. That was another advantage of VENICE: they have internal ND filters. For example, if it got cloudy, I would set the exposure based on where the aircraft were flying. I imagined their flight paths using Google Earth, and figured they're going to go around this terrain, the mountains look pretty high here, they're probably going to go down low over there. And then we would just kind of guess exposure and lock it in and hope for the best. I think 99% of the time I got the exposure right.

How did you start and stop the cameras?

Keslow Camera built us a little button that the actors would hit to trigger all the cameras to run. They also got feedback on a little readout to indicate what cameras were running, or not. There were six VENICE cameras in the cockpit, including the over-shoulder angles. So four are focused on the actor and two are looking forward. We had very early versions of the VENICE Rialto. As you may remember, we went to Japan and gave them a lot of advice on the design and engineering of these cameras.

I remember your major contributions to the development of the VENICE, internal NDs, and menus. A product manager said, "Claudio had a significant influence. By far his major contribution was the suggestion of 8-stops of internal ND, the only camera to have it. He also pushed the engineers for internal RAW recording which was implemented in VENICE 2." That was not in time for *Top Gun,* but you just used it on *Nyad,* the feature about marathon swimmer Diana Nyad.

Initially, the Rialto was not about getting it into the jet. It was

about getting it into the smaller F1 Shotover that goes on the front of the jet. It was devised so you could put the sensor block and lens in the Shotover, and then run the cable to the camera body and recorder inside the jet. Then I could attach any lens I wanted, like the the FUJINON 25-300 inside the small Shotover. And then we found it really handy to be able to use inside the jet.

In what aspect ratio did you compose *Top Gun: Maverick*?

Top Gun: Maverick was released in 2.39:1 and 1.90:1 for IMAX. Because of framing in the jets, where pilots are sometimes inverted and we couldn't move the camera, we framed in 16:9 and cropped in post. We couldn't move the cameras, but we could move the pilot's seat to accommodate the actors' different heights to give us proper headroom.

Did you lock the cockpit lenses off with tape?

Yes, the focus and iris barrels were all locked off. Also, if you remove its PL mount, VENICE has a native E-mount underneath with a very secure lever locking mechanism that holds the lens in very tight. In fact, it has a safety locking detent, so E-mount may be even more secure than PL.

Who approved the safety of the cameras in the cockpits?

The Navy engineers determined whether it was flight worthy or not. Initially, they told me that I'd never get six cameras in there. "You'll barely get three inside," they said. I just said OK and started looking inside the jets every day. I noticed some video cameras and asked what they were for. And they said, "Those video cameras record internal stuff." I asked, "Can't we just strip out the equipment you don't need in here? And then see how much room we have left? You don't need to record any video, because we're recording all the video as well." And so they allowed me to remove

Claudio Miranda, ASC on *Top Gun: Maverick*

Tom Cruise in narrow hallway. VENICE camera up against the wall in Rialto mode, with Preston Light Ranger, SmallHD monitor, OConnor 2575 head on Fisher dolly. Photo: Scott Garfield. © 2022 Paramount Pictures Corporation.

things that weren't essential and utilize that space.

In the end, we did get six cameras inside. It had a lot to do with just being there every day and politely asking questions.

There was another time when I was on the aircraft carrier with a small crew and two cameras. I was struggling a bit, trying to get the light in the right place. Someone asked me how it was going. And I said, "It's going okay but I really wish that I could ask the captain to head in a certain direction for better light. And they said, "No, you can't ask the captain to turn the boat. Are you crazy?" And I kind of thought, well, that does sound pretty crazy to alter the heading of an aircraft carrier just for the film.

A little later, someone else came up to me and asked the same question—how I was doing. I didn't know who he was. I said the same thing as before, that I was bummed out that I could not turn the ship to favor the light. He said, "Sure, that's not a problem. We can do anything you want." And he indicated they had something like 23 years of fuel on board.

He asked, "When do you want it? I said, "At four o'clock, it'd be great if the ship was heading 90 degrees. That would put the sun in a perfect place for us." I didn't think it would truly happen. But at four o'clock, the whole aircraft carrier turned and headed in the right direction, due east.

It's like many things in life and business: people can be afraid to talk to the person above them. But just by chance, I happened to pass the right person in the hallway. I called our liaison officer the best gaffer we ever had. And then it got even more incredible. We were turning the ship all the time. They would ask where we wanted it now and then change course accordingly.

Later in the schedule when we had to do the full-on shooting

with Tom Cruise and everyone, I said "When we were on the Lincoln a few months ago, they let us change course according to the best sunlight." Of course they couldn't be upstaged. So they left an officer with me who was in charge of wherever we wanted the ship to turn and he was always really helpful.

They could even control the headwinds by turning the ship. The only difficult thing was if the ship was going right toward the sun and the pilots had to land on the deck—they were a little hesitant about that one, which I understand. They would just veer off a little bit so the pilots weren't getting totally blasted by the sun on take-off and landing. There were some limitations.

Did they turn 180 degrees so you could get reverse angles?

Oh yes. Whenever we were doing a reverse, I just always kept them backlit, or three-quarter backlit, with the sun behind the actors. They just turned the whole aircraft carrier around.

Was it similar with the aerials, finding the light?

Yes. We talked to the actors, we talked to the pilots, we had ground briefings all the time. For continuity and to have good backlight, I always wanted the actors to have the sun behind them, from 4 to 8 o'clock. As long as the sun was behind, that was our direction. This was great for the four cameras facing aft, facing the actors. But it wasn't as good for the two cameras facing forward, which was front-lit. With multiple cameras, one angle is going to suffer. But I figured this was about getting the beats and maybe there'd be some shots where the jet was turning. So, we had two jets flying at the same time, with six cameras in each. We had another four cameras in pylon positions on the wings and additional cameras underneath looking forward or backward. There were a lot of cameras and lenses working on *Top Gun: Maverick*.

Sony VENICE Extension System 2 (Rialto 2) and Firmware Update 2.0

Sony VENICE Extension System 2
(aka Rialto 2)

VENICE 2 camera body

VENICE 2 sensor block
and lens mount

Tether cable

VENICE Extension System 2 (Rialto 2)

This is an updated version of the original VENICE Extension System, unofficially known as Rialto. Just as the Rialto is a central area of Venice and the Rialto bridge connects San Marco to San Polo, the Sony VENICE Rialto 2 connects two essential components of the camera. The tether cable is like the bridge, connecting the camera body to the sensor block and lens mount module.

VENICE Rialto 2 works with both the original VENICE (6K) and VENICE 2 (6K and 8K). Cable length has been extended—you can connect body to head with a 3m or 12m cable and you don't need a repeater for the longer run.

VENICE Rialto 2 is about the same size as the original, at 158 x 147 x 126 mm. It weighs around 2.2 kg (with the PL mount). A tilt and roll sensor in the VENICE 2 camera head detects motion, records it as metadata and outputs it via the camera's SDI port.

Rialto 2 also has four assignable user buttons (only 1 for original VENICE). They can be configured, for example, to select internal ND filters, start/stop recording, etc.

VENICE 2 Version 2.00 Firmware Update

New imager modes and maximum frame rates include:

Full Frame	8.6K	17:9	up to 48 fps
	8.2K	2.39:1	up to 72 fps
	8.1K	16:9	up to 48 fps
Super 35	5.8K	Anamorphic 4:3	up to 60 fps
	5.5K	2.39:1	up to 120 fps

Additional VENICE 2 Version 2.00 Update Features include:

- Embed LUT (Look Up Table) and CDL (Color Decision List) data in clips.
- Zoom to fit monitoring output for anamorphic lenses.
- 8 positions in EVF and on monitors for recording icon.
- Focus assist: one of nine positions in the viewfinder can be magnified for critical focus.
- Output the same image as the viewfinder with peaking and zebra settings viewable via monitor-out.
- Playback position in the clip is displayed and allows frame-by-frame playback.
- EI (Exposure Index) metadata is applied during playback.
- For virtual and active background production, Version 2.00 firmware update adds sync functions.
- Phase shifting of Genlock lets you shift visible artifacts until they disappear. These might include, for example, pulsing of LEDs or the dreaded horizontal bar seen on an analog TV or monitor screen.
- Genlock is also available when shooting at high frame rates.
- VENICE 2 Version 2.00 will be released in early 2023.

Otto Nemenz International

Otto Nemenz International has moved from Hollywood to an impressive new facility in Culver City. This is Otto's third move. He opened the original rental house at 7531 Sunset Boulevard in 1979 and Alex Wengert was one of two employees. A few years later, ONI moved to 870 North Vine Street.

The new Culver City location takes up almost an acre of interiors: 38,000 square feet total, 6,000 square feet of prep area with 21 prep bays, 23 ft ceilings, and 2 individual prep rooms with black 12 ft ceilings. The parking lot has 128 spaces, a loading dock, and a loading ramp.

The lens area has expanded with a new Trioptics ImageMaster Cine Flex and a large projection room with tracks and multiple projectors.

L-R: Fritz Heinzle, Executive Vice President and Alex Wengert, General Manager.

Dan Lopez with the Trioptics ImageMaster Cine Flex and a cart full of Leitz Summilux-C primes.

Otto Nemenz International
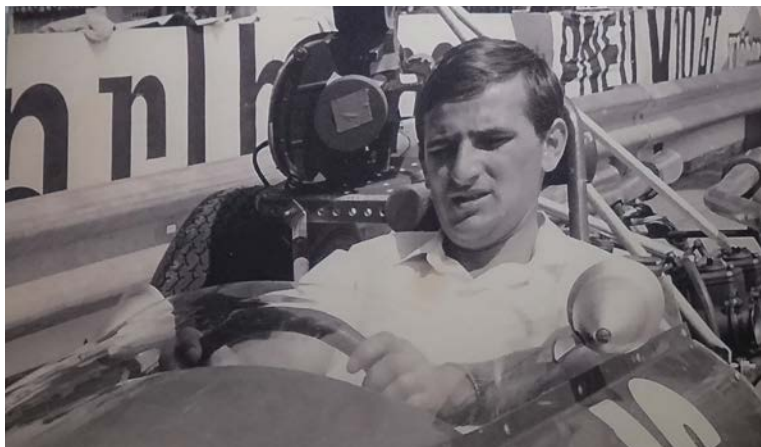
Otto Nemenz was the Super Panavision 70 camera and lens technician on *Grand Prix.* Otto still enjoys fast cars and fine cameras.
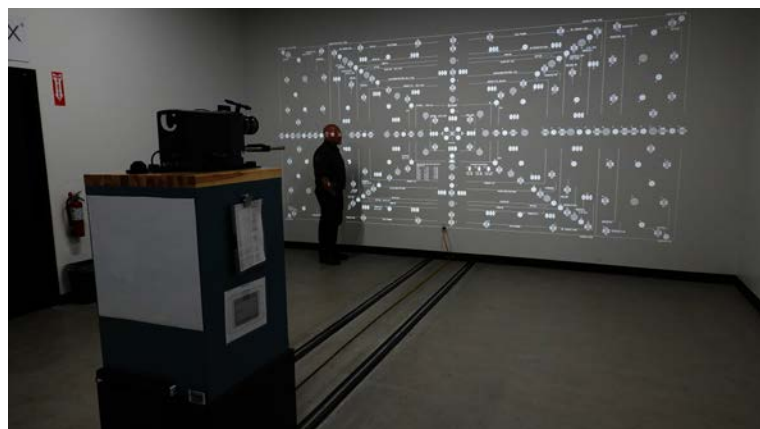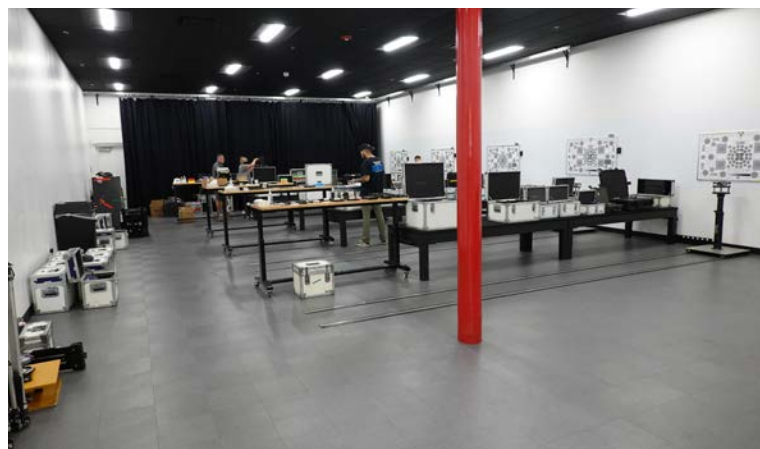
Above, CNC Machine Shop.   Below, Camera Assistant Cart Parking.

Above, Lens Projection Room.   Below, Nemenzized Sony VENICE 2.

Top Secret from Easyrig

Easyrig UK ambassador Sam Wordsworth in a secret, undisclosed location.

STABIL G3 Lever-Lock
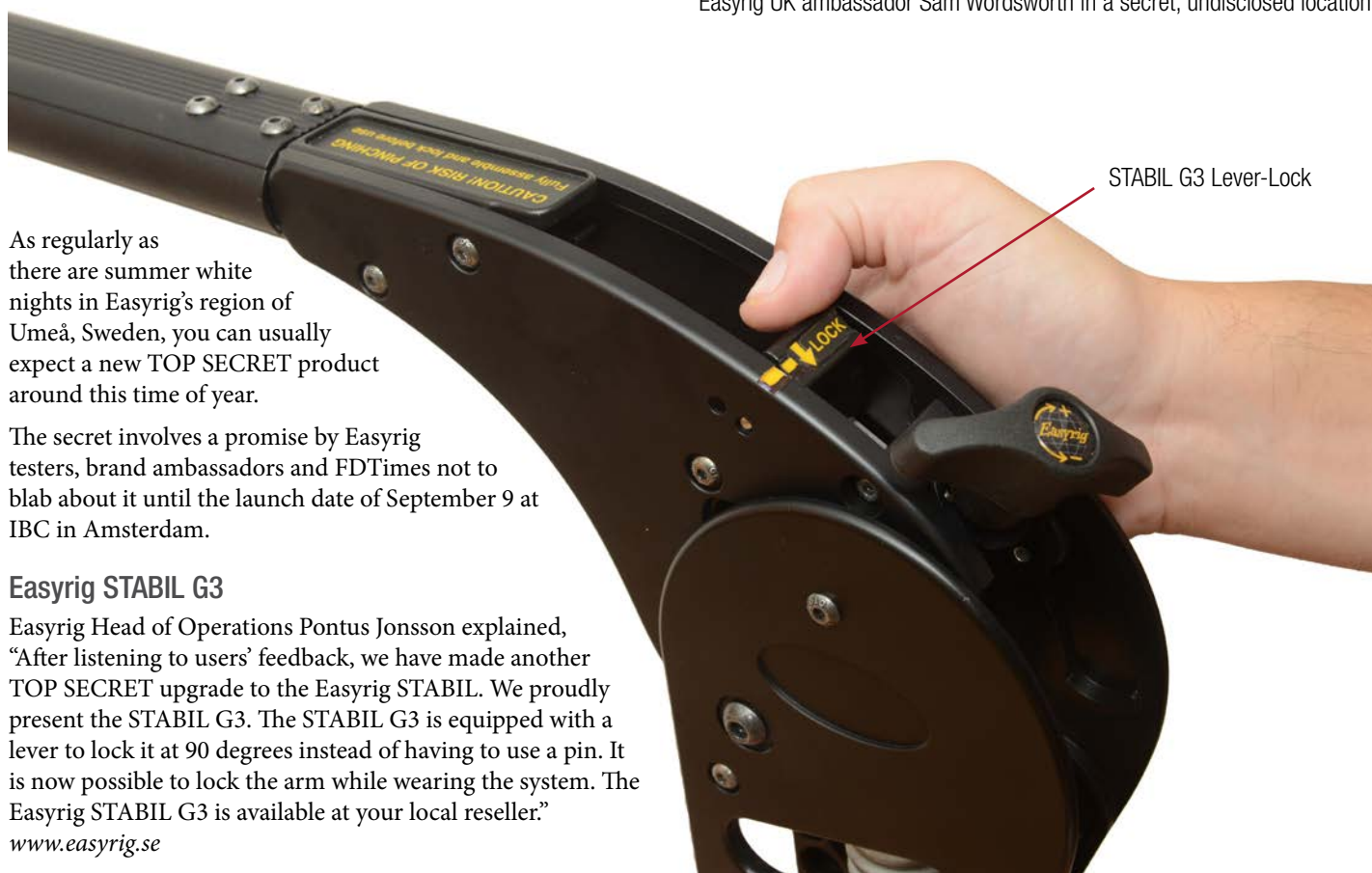
As regularly as there are summer white nights in Easyrig's region of Umeå, Sweden, you can usually expect a new TOP SECRET product around this time of year.

The secret involves a promise by Easyrig testers, brand ambassadors and FDTimes not to blab about it until the launch date of September 9 at IBC in Amsterdam.

Easyrig STABIL G3

Easyrig Head of Operations Pontus Jonsson explained, "After listening to users' feedback, we have made another TOP SECRET upgrade to the Easyrig STABIL. We proudly present the STABIL G3. The STABIL G3 is equipped with a lever to lock it at 90 degrees instead of having to use a pin. It is now possible to lock the arm while wearing the system. The Easyrig STABIL G3 is available at your local reseller." *www.easyrig.se*

BLACKWING7 Amber Skin Program

BLACKWING7 Amber Skin program from TRIBE7 is reminiscent of Canon FD and K35 vintage 1970s but without radioactive Thorium Oxide elements that you can check with a Geiger counter.

The new BLACKWING7 Skins consist of front and rear elements with specially formulated, non-radioactive amber coatings. You can add an amber color front barrel to designate the look and easily find it within your lens case that presumably has many other BLACKWING7 versions. "Variants" is how Tribe7 co-

founder Neil Fanthom (above) calls them. The amber skins can be purchased as additions to your existing BLACKWING7 sets of tunable Full Frame lenses. A skilled lens technician can swap the elements.

Binary Skin kits are coming out in October/November. Production kits will be in early 2023.

AbelCine distributes and services BLACKWING7 lenses in the US. *blackwing7.com*

AbelCine Spring Tech Showcase

AbelCine Spring Tech Showcase at their Industry City, Brooklyn location on Saturday, May 21 was an enjoyable, focused, comfortably-sized, local event — and an example of where many trade expos and equipment shows may be heading. It was a day of exhibits by the major camera, lens and lighting manufacturers, panel discussions, tech sessions and the premiere of the new BLACKWING7 amber SKIN program by TRIBE7.

Jay Holben was signing his definitive and encyclopedic The Cine Lens Manual. Co-authored with Chris Probst, ASC, at 836 pages, it is profusely illustrated with photographs of every imaginable lens. It's a must for every DP, AC, rental house and lens lover.

Canon showed their T2.4 Flex CN-E20-50mm T2.4 L F/FP and the CN-E45-135mm T2.4 L F/FP Full Frame zooms. The Flex zooms come in EF or PL mount. The EF mount provides electronic shading and chromatic aberration correction when used on Canon's EOS R5 C with an EOS RF-to-EF mount adapter. The R5 C also will display Flex zoom lens data (focal length, aperture and focus distance) as well as Manual Focus Guides (green arrows to guide you in to sharp focus.)

Tim Smith demonstrated the seamless and simple customization of Angenieux Optimo Primes with their IOP swappable internal element, iris modules, front and rear filters.

Motion Impossible's remote controlled, modular, motorized Agito dolly glided through the halls, navigated by Ben Dair, Chief Product Officer. Camera operators and dolly grips could practice their skills and perform dry runs on Motion Impossible's simulator.

Declan Quinn ASC, Rick Gioia and Jordan Levie discussed cinematic approaches to capturing Broadway performances, moderated by Geoff Smith. Vanja Cernjul ASC, M. David Mullen ASC and Antonio Riestra ASC presented a "Painting with Light using Lenses," moderated by Jay Holben. DP Rick Siegel discussed the history of large sensor multi-cam in AbelCine's Cinematic Multi-Cam Zone. "Insights and Inspirations: Leading Industry Voices for Diversity, Equity, and Inclusion" was moderated by Becky Morrison (The Light) with speakers Reema Elghossain and Jaz Lawrence. And lots more.
abelcine.com

AbelCine Spring Tech Showcase

AbelCine's Jeff Lee and Pete Abel in front of lens and flare room

Joe Facchini (AbelCine)

Jay Holben and his essential, terrific *Cine Lens Manual.*

Cinematographer Jendra Jarnagin with the *Cine Lens Manual.*

Motion Impossible's Ben Dair drives Agito remote controlled, modular, motorized Agito dolly through AbelCine Spring Tech Showcase.

Driving the simulator, like training wheels for the Agito: joystick controls for the Agito dolly grip, wheels for the operator.

Sam Nicholson, ASC on *Our Flag Means Death*

Rhys Darby as Stede Bonnet and Taika Waititi as Edward Teach (Blackbeard) in *Our Flag Means Death.* Photo by Aaron Epstein / HBO Max.

Sam Nicholson, ASC discusses his work as virtual production supervisor on Our Flag Means Death, *starring Taika Waititi as Blackbeard). The story is loosely based on the true adventures of Stede Bonnet (Rhys Darby), who bailed out of pampered aristocracy to become a pirate. David Jenkins, the series creator, said, "Very early on, I was talking to Taika about it, and he said, 'don't do any research.' It was nice to...then invent things..." Sam Nicholson is Founder and CEO of Stargate Studios.*

No one really likes working on green screen.

We launched the concept of a virtual backlot on green screen about 20 years ago using backgrounds filmed on remote location so that series television could seem to appear to have been filmed on location while principal photography was still being done in Los Angeles. For Ugly Betty, it was New York. For Pan Am, it was Idlewild Airport, now JFK Airport, in the 1970s. And for 24, it was Washington, DC, which is very difficult to film. The more difficult the location, the better, because we generally shoot with a very small team and few people ever know we're there.

Today, I love shooting on LED volumes and working in real time on set, because no one really likes working on green screen. Green screen is like sensory deprivation for actors, directors and cinematographers.

What's the resolution of reality?

Then, along comes the intersection of LED technology combined with powerful Nvidia graphics cards and all the Blackmagic Design hardware now allows you to economically capture 12K RAW motion picture images, color grade on set and feed vast amounts of data to a 20K screen, in 8K chunks, using Blackmagic 8K DeckLinks. And all of a sudden, the question of why 8K becomes, "Well, why not 20K, 30K, or 50K?" If you're going to virtualize reality with a camera and capture data, then the pixel count is crucial. So when people ask, "Why do you need

12k," I say, "Well, what's the resolution of reality?" It is at least 12K, probably more.

Our Flag Means Death

For *Our Flag Means Death*, we determined that we wanted a contiguous wall, 165 feet long by 30 feet high, surrounding a pirate ship, covered by multiple cameras because it's a comedy. Taika Waititi likes to shoot long takes with multiple cameras. He didn't want to be restricted by a frustum—a single view where it looks really good in one angle, but it doesn't look good anywhere else. I understand the necessity for a frustum or multiple frustums if you're in the 3D universe, but we had a very short prep schedule of only six weeks, and we're talking about ocean backgrounds at 20K in about five-minute loops. So for anyone who's done water work, with multiple scenarios that would last an entire season, the economics of it all suggested that there just wasn't time to even think about the CG route.

We were on a boat to shoot the backgrounds with five Blackmagic URSA Mini Pro 12K cameras. The images had to be stable, which proved to be a major challenge because we weren't on a barge. We were on a small boat, rocking around a lot. That doesn't work well on a big video wall when you're trying to stitch five cameras together. We used Unreal Engine to drive, stitch, modify, and control the lighting. And we used Blackmagic hardware on set to distribute what was five times 12K, so 60K of data. We chose the Blackmagic 12Ks because the BRAW files are incredibly efficient and very high quality. Even so, we were shooting about 30 terabytes a day.

URSA Mini Pro 12K cameras recording to SSD Drives

After a call to my friends at SanDisk and Western Digital, we decided to go with 100% SSD memory on the cameras. We put a 4 Terabyte SanDisk SSD Extreme on top of every 12K camera. You shoot all day on the boat, get in at 10 pm, get back to the

Sam Nicholson, ASC on *Our Flag Means Death*

Sam Nicholson, ASC.

hotel at 11:00, and now you've got from 11:00 PM until 4:00 AM to download 30 terabytes of data from the cameras' SSDs to 200 Terabyte SSD RAID arrays.

Hope that half the crew is not seasick

You back-up the data, format the SSD drives to get ready for the next day and hope that half the crew is not seasick, which definitely happened. That was the one thing I didn't anticipate—what percentage of people would be hanging over the side. That's definitely not in any cinematographer's handbook. Transderm Scopolamine patches should be in the handbook. I've done a lot of boating, so I don't have a problem with being seasick, but some of the crew did and used those patches behind the ear.

But we went through inclement weather so rough that we had to turn back a couple of times, with heavy rain and all the things that you get in the real world, but that translated into some really amazing footage and it was all real.

Over two weeks in Puerto Rico, we shot landscapes, shorelines, seascapes. We shot on boats, did aerials and used drones. We built a library for the entire season of the show with many options. Clearly, you have to over-shoot. That's really what you want to do if you're going to build a virtual library for a series—it is better to get a lot of footage and be future-proofed so that it's not only good for that season, but you might be using it five years from now.

What are the creative goals?

The defining factor off the top is, "What are the creative goals?" Then, you need to think forward and say, "What's my schedule and budget?" And, "How do we come up with a plan, whether it's CG, photographic, a hybrid, or whatever? How do we blend these tools at a price that the production can afford, that meets the schedule, and that we can be on set with a dependable system?" And so you need to have enough time to test, and see those im-

ages up on that 165-foot wall, and really be 100% confident when you step on set for that first day of principal photography, that there will not be a single minute of downtime. I'm glad to say that in 12 weeks of shooting, we never had any downtime at all. No one ever had to wait on the ocean backgrounds.

Like an orchestra

Everyone has to be on the same page for virtual production to work. The studio has to be fully supportive of the director, the DP, and critically, the OFMD production designer, Ra Vincent. We talked very early on and started doing computer layouts of the virtual space to ensure that the screen was big enough, and when would we shoot off it? And when would you see the floor? How high could you put the camera? What kind of wide lens? What kind of moves could you do? I think all those things need to be rehearsed in virtual space before you begin because the last thing you want to do is drop a 165-foot by 30-foot high wall in and have it in the wrong place. That is not an option. The set for *Our Flag Means Death* was in the biggest stage we could get at Warner Bros. in LA.

Very early on, after a lot of discussions with Ra, we decided to split the ships into three parts and put them all on wheels so that they could be rolled in and out, and they could become different ships: the French warship, the English warship, and of course the Revenge. When you get virtual production right it's like an orchestra that is hitting all the right notes. That's really exciting.

On location in Puerto Rico

We did San Juan first. The east end is much calmer, so we did a lot of work there. When they run aground, the backgrounds of the beaches and forest were in Puerto Rico as well. And a lot of good visual effects work went in there to blend it all. We had our team in Malta working on traditional visual effects and DNEG did most of the heavy lifting.

Sam Nicholson, ASC on *Our Flag Means Death*

Stabilizing 5 cameras on a small boat

The reason we didn't have a big barge rather than a bouncy powerboat as the camera platform at sea was mainly economics. We wanted to be able to travel rapidly between locations and get tight to the beach and go over shallow areas. So we had a medium-sized fishing boat, about 35 feet long. To stabilize five Blackmagic URSA 12 cameras, we had a Black Unicorn 3-axis stabilized head. We also digitally stabilized everything again in post afterwards.

To sync all five cameras together, we used Denecke time code generators. We synced time code feeding each camera's time code input. These cameras weren't genlocked. Matching time code is crucially important.

Lenses

We used 12mm Laowas, 25mm ZEISS Batis, and, of course, lots of SIGMAs in all focal lengths that were great because they are affordable, very sharp and neutral.

Photographic vs CG backgrounds

I'm very proud of how we addressed *Our Flag Means Death*. We made all the right decisions about whether it should be photographic or CG and how we built the set. How could we give Taika high resolution backgrounds against which he could shoot

anywhere he wants? You can tell when you look at the show that it feels very natural.

I think everybody kind of gets obsessed with, "Oh, it has to be a CG background." But we worked very hard to ingest very high-resolution photographic data, captured at infinity (so there are no parallax issues) into Unreal Engine engine and allow it to play all these virtual moves, and manipulate them, and do off axis projection and so on. Coming at virtual production from a cinematography starting point is something that I think we're really good at because we've been doing it for a long time and we have all the right hardware and the right connections.

Real-time playback

Interestingly, in virtual production, everything has to be based on real-time playback. What you can you do in real time is the underlying, capital, bold-typeface question that you must keep in mind because no matter how good your world is, or how high res or beautiful its detail and texture, if it doesn't play at 24 frames per second on that screen, you're out of luck.

Principal photography on the stage

For principal photography at Warner Brothers in LA, the main unit had Arri LF cameras. Our LED volume was not genlocked, so we relied on high frequency refresh rates on the whole screen

Sam Nicholson, ASC on *Our Flag Means Death*

to avoid banding and sawtooth artifacts. Very early on, we explained that we were not going to be able to shoot high speed. Don't expect to go 48 frames per second non-genlocked on a wall this size. We avoided frequency problems, by testing background playback at our facility and the curve of the wall and the color shift of the angles. We did extensive testing for three or four months before the show started.

Pixel math

Here's the resolution math. We had five URSA Mini Pro 12K cameras. That's 5 x 12K = 60K. But the LED wall was 20K horizontal resolution. We overshot the backgrounds at 60K total resolution with multiple cameras, and lost about 20K in the overlaps of the cameras. The primary stitch that we put together was about 40K, which looked fantastic. We then down-rezed it to 20K for the wall.

With each master background comped at 20K horizontal resolution you have to ask how many 8K feeds will it take to create a 20K screen? With a 16:9 ratio, if you take an 8K single panel and you put four of them in a quadrant, four of them will create a 16K image. But our OFMD LED wall was longer than that. The wall was 20K horizontal and 6K vertical, so we had to add two more 8K instances on one side of it. So you really are driving six synchronized 8K screens.

We used about 2,500 ROE P2.8 panels for OFMD, so that's about

800 panels per screen. Sweetwater did the installation on the LED wall and it was beautifully engineered—it worked flawlessly throughout the series. Sweetwater engineered the LEDs and support, but Stargate created and drove the content for the volume. Our Stargate team has lots of experience in shooting and serving content so it plays back perfectly. We understand production and what kind of controls we're going to need on set. One of the problems with just hiring a company who can build big LED walls is they don't necessarily understand the demands of live action virtual production.

DaVinci Resolve

Everything was fed and synchronized through six DaVinci Resolve Studios (Blackmagic's post production software application) in real time. Not only do the cameras have to sync to the screen, they also have to sync to your DaVinci Resolves and Unreal Engine that are feeding them in real time.

You have to be prepared on set for the DP to ask, "Can you make the depth of field a little bit more shallow?" or directorial requests for editorial changes and VFX adjustments.

So you do a master shot. Everybody says, "Oh, that looks great." It's a three minute take and you want to do pickups. The image has to update. You have to edit on set and jump into the time-

Sam Nicholson, ASC on *Our Flag Means Death*

line, say a minute and a half downstream, and all the tracking, rendering and playback machines have to update. And when they get to the closeup, they may say, "Can we make the horizon rise and fall faster?" Or add clouds. We're doing visual effects through Fusion and the DaVinci Resolve live on set, editing and synchronizing multiple DaVinci Resolves at once. It's a considerable challenge, but that's what you have to do to respond to creative requests on set.

Plan B and Be Pleasant

You learn, having lived through a lot of productions, to always have a plan B. Your Plan A is going to have snags in it eventually. If nothing else, someone kicks out the power and all of a sudden your machines go down. It's happened. Both the scary but also the satisfying thing about virtual production is that it is live performance. Any mistake that you might make is going to be up on 165 foot wall in front of the crew. There's no place to hide.

It takes a unique production-tested group of people that can go in and be creative, be pleasant, not let the pressure show and make it into a really nice experience. Because Taika likes a really relaxed set. Music's playing, everybody's having a good time. They're doing comedy. They're doing great. And the last thing you want to do is the technical rocket scientists over on the side saying, "No, you can't do this." It has to be fluid and creative and fun.

When people come over and say, "Wow, it feels like we're really on a ship. And can we do this? And can we try that?" Then you have a tool that is actually doing what it's intended to do as a production tool and not as science experiment. That tone that was set by HBO as well. We have a long successful history in VFX and virtual production with HBO..

Productions have challenges either about budget or technical or timing. This was not so much of a budget challenge, as it was a technical and schedule challenge because Taika's schedule is extremely tight. The concern on the executive level was really about not wasting a single minute of his time. At one point, he was

finishing another picture during the week. So we had to shoot on the weekends for 12 weeks, which is in itself a challenge for everyone on the production.

Meanwhile, back on the boat in Puerto Rico

The dependability of your hardware is your lifeline, both in Puerto Rico and on set. Everything has to be production-proven and backed up, and you have to have an alternate plan and you have to have extras and spares and all that stuff that you need. And we're a very small crew of only four or five people.

For example, to change aperture, the AC doesn't climb up and change each lens. We wrote some very interesting software to control the cameras and the lenses. We're controlling the lenses and the functions of the camera through the Blackmagic Design ATEM Mini Extreme switcher. We can see all the cameras. You absolutely want to see that they are all recording. If you can't see them and you can't check them, that's a problem. You can switch from one camera to the other. The ATEM was in a plastic bag with a power inverter because it's an AC system and you're on a boat and there is no AC. There's no generator. You're inverting from 12 volts to 120 inside a bag that's getting sprayed with about a 40 mile an hour wind hanging on to the side of a boat, bungie cording the thing onto the sticks. It's the real world. It's not in a lab. When the tools can live through a shoot like that, you say, "Okay, that's good." You have to have this very dependable, flexible hardware that is realistically affordable. Blackmagic hardware has amazing bang for the buck.

The array for the big wall in the studio had to be an extreme high pixel count. And one of the things that sold me on the Blackmagic 12K camera was being able to put 4 Terabyte SSDs on top and record all day long through the USB-C port.

You're on a relatively small boat, up in the crows nest swinging around, trying to hang onto the cameras with sea spray and everything coming over you and the sun is going down and some of your crew members are immobilized, seasick. And you're thinking like, do I really want to just swap a 160 gigabyte card at that point? There's no way. Any single thing that allows you to streamline the data pipeline and still get that kind of resolution in a dependable and affordable package is what we need. And the Blackmagic RAW is very efficient.

I have to say that if anyone has a 12-camera shoot on location in small boat with salt water spray everywhere and a checkbook for $500,000 I would love to do that. However, we all have limited budgets. I love shooting with the expensive cameras; they are brilliant. When I'm putting multi-cam rigs together shooting for virtual production though, you really need high quality gear which is both dependable *and* affordable. The data has to be great. When it's all said and done, you have to have a beautiful image at the end of the day and the URSA Mini Pro 12Ks delivered on *Our Flag Means Death*.

The plates had to be shot from about 20 to 30 feet high. That's how high a pirate ship is. So we put the cameras on a flying bridge of our fast fishing boat. But the thing that you forget about it is even though the camera may be steady, you are getting hurled around. Up there, while you're trying to change lenses and get your shot in the middle of the ocean, it's a pretty wild ride.

Nanlite Forza 720B / 720

The Nanlite Forza family is growing. Forza lighting fixtures are called Spotlights but they do much more.

You could say these COB LED (Chip-on-Board) fixtures are like a combination of Monolight shape, PAR, LEKO, Open Face, accessorized Fresnel, incredibly small, lightweight, versatile and powerful. You can attach reflectors, lenses, modifiers and soft-boxes.

Forza 720 and Forza 720B are the brightest Nanlites. Forza 720B is bi-color from 2700K-6500K. Forza 720 is daylight 5600K.

Forza 720 and 720B come with a standard Bowens mount, making them compatible with NANLITE's large line-up of light modifiers and products from third party manufacturers. The advanced yoke has an umbrella mount for more light-shaping options.

 Forza 720/720B can be continuously dimmed from 0-100% in 0.1 increments. Connect with the NANLINK App to the dual built-in 2.4 GHz and Bluetooth module or via DMX/RDM.

Forza 720B

- Bi-color: 84,460 lux @1m
- 2700K-6500K
- TCLI: Average 97
- Power: AC 100-240V 50/60Hz, 800W
- Battery: DC48V/16.67A Max
- Size, Light Fixture: 518×228×142 mm / 20.39×8.98×5.59"
- Weight, Light Fixture: 5.3 kg / 11.7lb
- Size, Control Unit: 156×140×332 mm / 6.14×5.51×13.07"
- Weight, Control Unit: 4.2 kg / 9.26 lb

Nanlite Forza 60C / 60

Forza 60C / 60

Forza 60C is a full-color LED Spotlight with an RGBLAC six-color system that is compact, lightweight, and affordable. Forza 60 is 5600K daylight.

Forza 60C uses an innovative six-color system, integrating additional LED beads of Lime/Amber/Cyan into the traditional RGB light source. The fundamental problem of an incomplete color spectrum is improved over RGBWW systems.

Forza 60C offers HSI / RGBW / XY modes for color calibration.

Forza 60C continues with the popular and ever-growing FM mount, offering a great selection of tools to control light. It's totally up to you to choose either hard or soft light, light shaping possibilities will be further expanded by integrating into the Bowens mount system via the included Bowens mount adapter.

The L-shaped yoke of Forza 60C can connect with a battery grip when you want to go cable-free.

Forza 60C

- Full color: up to 12,810 lux@1m
- 1,800K-20,000K (Green/Magenta ±100)
- TLCI: Average 95
- Power: AC 100-240V 50/60Hz, 88W
- Battery:DC 15V/6A Max
- Size, Light Fixture: 224 × 110 × 88 mm / 8.82 x 4.33 x 3.46"
- Weight, Light Fixture: 1.08 kg / 2.38 lb
- Size, Power Adapter: 141 × 82 × 50mm / 5.55 x 3.23 x 1.97"
- Weight, Power Adapter: 0.47 kg / 1.04 lb

René van der Reiden, Managing Director of CVP Belgium

CVP demo gear in Vilvoorde for users to try, touch, and feel.

CVP, with UK offices in London, Brentford and Studlely, opened a new facility in Vilvoorde, Belgium earlier this year. It's 8.4 km north of Brussels Airport, in an area filled with film studios and rental company They invested in new sales, engineering and warehouse facilities, establishing a brick-and-mortar hub for their EU activities.

CVP has appointed René van der Reiden as Managing Director of CVP Belgium. Previously, he was at Aspectra B.V. and Alphatron in the Netherlands.

CVP Group Managing Director Jon Fry said, "European growth is a central part of our future strategy, and we are confident that René has the combination of skills and experience to lead the business through its next strategic phase, actively supporting our customer base as we continue to expand across the continent."

Like Oliver Twist, I wanted more, or rather, to learn more. On the video call were Benoit Foucault, Niels Lubbers and Jon Fry. Jon Fry is rarely at a loss for words and the full text transcription is almost as long as the original *Oliver Twist* novel by Dickens. An edited summary of our discussion follows.

Jon Fry: Before I ramble on for hours, and as you know, I have the propensity to do that, is there anything specific to discuss?

Jon Fauer: Please ramble on about CVP Belgium.

Here we are today, 18 months on from the joys of Brexit. It's only now that I feel that we can say that we are really arriving with the back in the EU division of CVP in as much as CVP Belgium. The company is now fully up and running, established, registered, with a 13,500 square foot warehouse space that is fully mezzanined, racked up and kitted out with an abundance of inventory.

...that we would expect for the just-in-time delivery that you're known for, as well as premeditated orders.

In fact, the warehouse operation in Brussels is better than our facility in Brentford, UK. We looked at all the things that we could change if we were to do it again and implemented those changes in Brussels. Everything is absolutely slick. We have a bit

of an idea of what the run rate is going to look like in Brussels, because it's not a great deal different to the one that exists currently in the UK, but with slight nuances. Fundamentally, we've got an element of stock in Brussels that's a percentage of what we would normally hold here in London.

As the warehousing operation is pretty much there, our supplier relationships are coming onboard. The guys have done a good job transitioning the relationships that we now have in the UK over to the EU region. It's not uncommon for CVP to have between 15 and 20 million pounds worth of equipment on the shelves at any one time. I think that's fairly unusual in our existing industry today. We'll try to establish that business model in the EU as well. Furthermore, we have the ability to do evaluations of used equipment for trade-ins and re-sale, and we're setting up an engineering, service and repair department.

What about service?

Our service department in the UK has 14 or 15 engineers. One of the things I think that was identified when we were wandering around with this accident of Brexit and ending up in Belgium is that there is a need for engineering and the capability to support the industry there. We are actively recruiting.

We'll put a lot of demo gear into Vilvoorde for people to demonstrate, touch, and feel. But it's also important, if you need service on your equipment, we can help you out with loaner gear, subject to availability. "Keep the job going." It's an expensive thing to do, but it's necessary.

What we're really trying to do in Belgium is to work with customers, to understand what their wants and needs are. We want to build a little network of friends along the way. What we're not trying to do is railroad this, come in and steamroll everyone and get them out of the way. It is actually about doing this in the right way, and remaining friends to everybody along the journey. Because we still need to work with everybody; the industry is too small. This isn't about competition, this is about working within the industry to provide services to the valued customer.

CVP Belgium
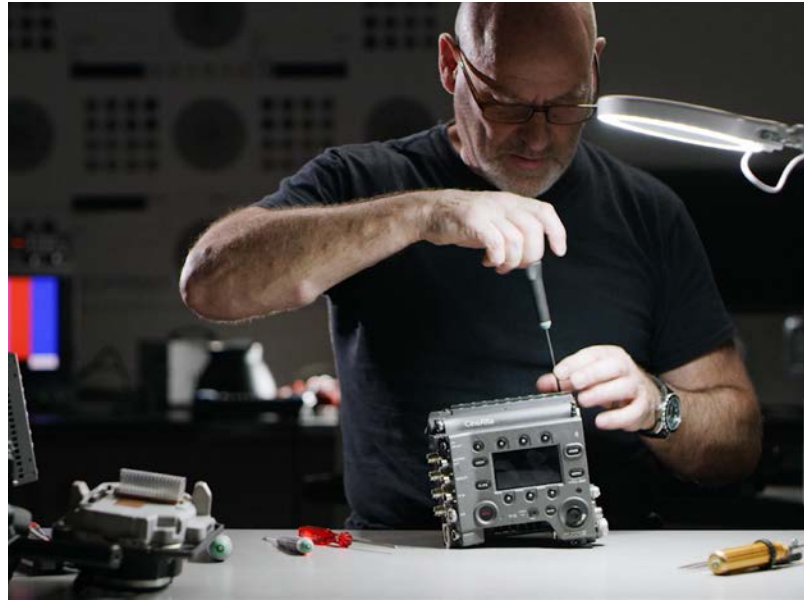
CVP's service department in the UK has 14 or 15 engineers. There is a similar need for engineering and service in the Vilvoord facility.

Does CVP Brussels have access to leasing and financing?

We've set up CVF last year. Creative Vision Finance is the UK finance home of CVP, that now has reached into mainland Europe and working with banks that include BNP, KBC and others. We've got relationships with banks in mainland Europe now. And so, we have the ability to do the finance.

So in a nutshell, that gives us the ability to replicate all of the functions and capability that we have existing in the UK, but for the EU market through Brussels, or just the Belgium market if that's where it is preferred by a certain supplier.

Does CVP Belgium have demo space as you do in London?

We've got 2,500 square feet of office space opposite the warehouse in Vilvoorde. That is being refurbished to accommodate the sales, reception and demo space. It'll be a smaller version of what you've seen at CVP London offices in Newman Street and Charlotte Street but again, with the same impact. I'd like it to have that wow factor, for it to be a destination for people to come to see some equipment, try, feel, find a system that's tailored to them.

Actually, the reason why we're going through a refurbishment and it's not us with a paintbrush and a bit of carpet in our hands, we're getting a company to do it properly because I want people to walk through the door and go, "Okay. This is cool. This is what CVP is about." If you go to a trade show, we do things properly. If you go to CVP Belgium in Vilvoorde, I want it to have the same impact. We've invested a lot of time, effort, money, and hired some very good people. If we then don't do it properly, it's pointless. So we'll be doing this properly.

This isn't a special formula that we're creating for the EU because I feel the formula already exists. We've created what I genuinely believe is a pretty successful business here in the UK based on understanding our customers' needs, or their pain points, or a combination of both and trying to work out answers.

What we're trying to do is fundamentally create the same capability within the EU to overcome some of the challenges of

Brexit. Brexit is still a challenge and is going to be a challenge for a long time to come, so this is why we've been left with really fundamentally no other option.

Are prices the same price in Belgium as in London?

The manufacturers are always looking for global pricing parity wherever possible. So depending on what currency you're buying in, yes, the price is fundamentally the same but there can be fluctuation depending on currency exchange rates.

In terms of VAT, rates average 21% but are different throughout the EU. VAT in Belgium and the Netherlands is 21%. UK is 20%.

That leads to one of my favorite discussions with you. What trends do you see in the UK, Belgium and the EU?

The trend right now, and across the whole industry, is a shortage of kit. Supply chain issues are the greatest challenge at the moment.

It's difficult to say what's hot and what's not when most is just not, because it's not available. Everybody is talking about the ALEXA 35. People keep saying it's the most anticipated camera. Maybe that's because it has taken so long to actually come to market. But it's incredibly well received. The enthusiasm and the commitment that people have prepared to make for that camera is palpable.

There's still an enormous demand for cameras like the FX6, FX9, but they are hard to get. I'm quite hopeful that Sony's deliveries will improve, so I think we'll see better numbers coming through, which I think will make things a lot more interesting, and we can actually start selling some of the accessories.

Where is this journey going?

We're not on a time scale here. I'd love to think that the EU market is far greater than the UK in terms of opportunity. There's no reason why CVP Belgium couldn't be a far larger company than CVP UK in years to come.

Atlas Mercury Anamorphic Lenses

Lucas, Prince of Darkness, should not go motoring about at night. This vintage Range Rover model has a look so pleasing it is in the permanent collection at the Museum of Modern Art. But please do not drive Lucas farther than you care to walk back when darkness-by-Lucas electrical systems and mechanical parts fail yet again.

That can be a perennial problem with vintage Range Rovers and vintage lenses. While they look beautiful, their mechanical components are not always robust.

Which brings us to the topic of vintage lenses and a new series of modern anamorphics with a decidedly beautiful vintage look from Atlas Lens Company. Atlas Mercury Anamorphic primes fit in the palm of your hand. Full Frame, light, compact, with a beautifully impressionistic look, they are front anamorphic cinema lenses with a 1.5x squeeze factor.

Mercury Series Anamorphics are significantly smaller in size and weight than the Atlas Orion Series. They have enhanced bokeh and warmer vintage tones—with a modern mechanical design. Mercury Anamorphics are a significant addition to the Atlas Lens Co. line of anamorphic cinema lenses since the debut of the Orion Series 2x anamorphic lenses in 2017 and the Orion 21mm, their widest front anamorphic.

This pre-production Atlas Mercury 42mm Anamorphic was used by Jon Fauer for all the images in this article.

Atlas Mercury Anamorphics
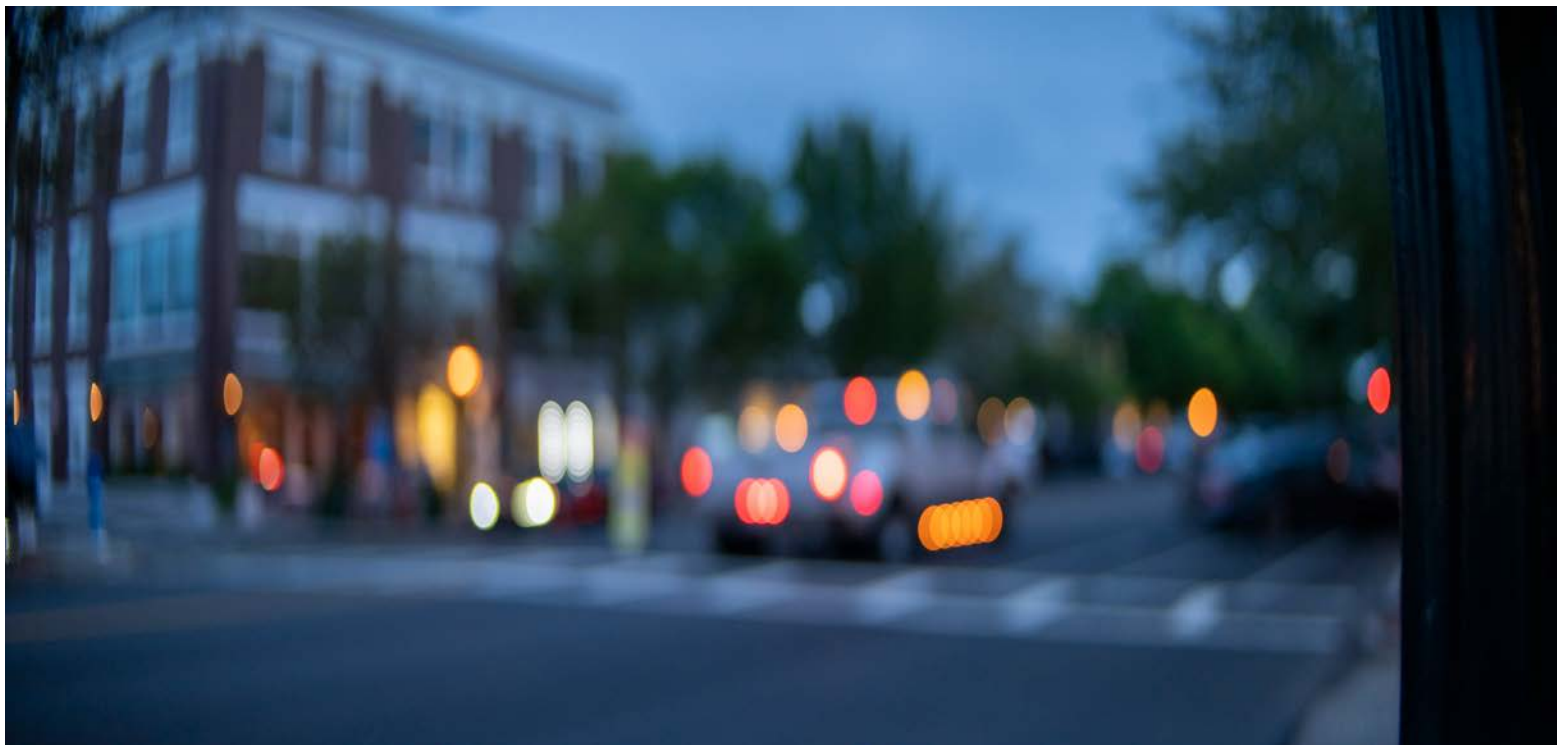
Atlas Mercury Details

The Atlas Mercury Series is intended for both film and digital cameras. Initial focal lengths are 42mm, 36mm, and 72mm — with 54mm and 95mm to be announced in 2023 along with an additional telephoto focal length. Here are some details:

- Full Frame image area coverage, 36.7 x 25.54 mm
- 1.5x anamorphic coefficient
- Widest apertures of T2.2 and T2.3
- 2.0 ft / 0.56m close focus
- PL mount.
- Lightweight and compact: Half the size and weight of Orion.

Golden streak flares, pleasing barrel distortion, minimal chromatic aberration.

Dan Kanes, CEO, Atlas Lens Co. said, "Mercury Series is yet another achievement towards the Atlas Lens Co. ethos of putting the world of cinematography in the hands of each image-maker. We're thrilled to introduce the Mercury Series - opening a new era in making your cinematography more interesting, more personal, and more rewarding.

Forrest Schultz, President, Atlas Lens Co. said, "We wanted to push the boundaries of the Mercury Series in optical and product design, balancing vintage character with modern sensor

Atlas Mercury Anamorphics
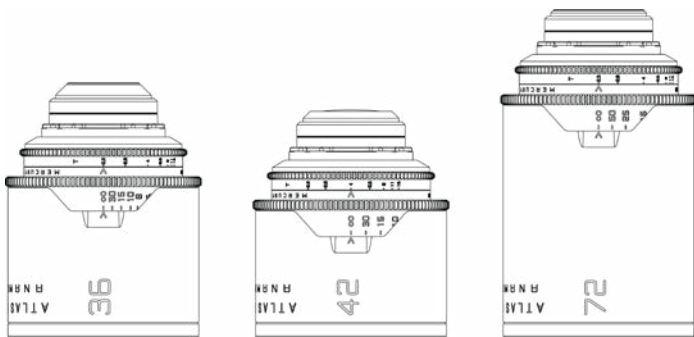
Atlas Mercury 36, 42, 72 mm

performance. Mercury images have classic anamorphic barrel distortion, painterly oval bokeh, and dynamic golden streak flares with the added benefits of zero mumping, excellent close-focus, near-zero chromatic aberration and a pleasant separation of foreground and background objects.

"The 1.5x squeeze is a creative choice. We started thinking about the sensors this is going to be used on. From a practical stand-point, we worked backwards from there."

Dan continued, "One of the other benefits of the 1.5x ana-morphic coefficient is that it's really a golden ratio in terms of delivery formats, because if you have a 16 x 9 recording, you're going to get 2.4 delivery, but if you have 3.2, which is 1.5:1, you can deliver 2.25:1 Ultra Panavision delivery format, or mask that down to 2:1 for streaming. Nested within that 1.5 coefficient are a lot of different delivery aspect ratios that line up well for exist-ing formats as well as new formats."

Having motored about at night, testing the limits of Prince Lucas's endurance, the beautiful wide-open bokeh and excellent capabilities of a new Atlas Mercury 42mm Anamorphic, I think they will be a great success.

Additional Information: *atlaslensco.com/mercury-series/*

Mercury Anamorphic	36mm	42mm	72mm
Apertures	T2.2-T16	T2.2-T16	T2.3-T16
Min. Focus	1.5 ft .46 m	2.0 ft .56 m	3.0 ft .91 m
Weight	2.7 lb 1.2 kg	2.3 lb 1.1 kg	3.6 lb 1.6 kg
Length	4.9 in 12.6 cm	4.4 in 11.2 cm	6.3 in 16.2 cm

- Additional focal lengths: 54mm, 95mm and 1 more to be announced.
- Anamorphic Coefficient 1.5x.
- PL Mount
- 95 mm front diameter for 36mm, 42mm, 72 mm
- Full-Frame coverage (36.7 x 25.54 mm)
- 14 blade iris.
- All elements are glass (no plastics).
- Lens body is scratch-resistant anodized aluminum.

Vocas Accessories for ARRI ALEXA 35

Universal Sliding Top Handle

Universal Sliding Top Handle and Top Plate for ALEXA 35, rear view, with bubble level

Top Plate for ALEXA 35

Vocas introduces a new line of dedicated accessories for the ARRI ALEXA 35. This complements the large selection of existing universal accessories by Vocas.

To ensure compatibility with their popular USBP Sliding Base Plate System, Vocas designed a new, low-profile ALEXA 35 Camera Adapter Plate. This plate attaches underneath the camera and lets you quickly change—without tools—between gimbal, rig, Steadicam, 15mm and 19mm (shoulder) setups.

Together with their accessory system for ALEXA 35, Vocas introduces a new Universal Sliding Top Handle. As its name suggests, the Top Handle is designed not only for the ALEXA 35 but can also be used with existing Vocas VENICE and future RAPTOR XL accessories.

One of the advantages of this new top handle, when combined with Vocas's dedicated ALEXA 35 Top Plate, is its low profile. This is something that documentary filmmakers have been requesting.

The lightweight Top Plate offers a plethora of ¼" and ⅜" attachment points and integrates Vocas's unique Level Marker. It also has a dovetail so you can slide the Top Handle forward and back balance the camera for optimum weight distribution. Best of all, it decreases the height of your ALEXA 35 setup significantly.

For a full list of our ALEXA 35 accessories go to: *vocas.com*

ALEXA 35 Camera

Camera Adapter Plate for ALEXA 35

Vocas USBP

Fujifilm X-H2S

My great appreciation of FUJIFILM still cameras began with the Finepix X100 at Photokina 2010 and then when I got one on a factory visit to the company's Saitama in 2011.

The camera had a fixed 23mm f/2.0 lens and an amazing hybrid viewfinder that combined a rangefinder-type bright frame optical viewfinder, and an electronic viewfinder. By using a prism for the 1,440,000 dot LCD panel image on the viewing screen in the reverse-Galilean optical finder, the Hybrid Viewfinder showed both the shooting frame and data.

It could also be used as a high-quality electronic viewfinder to compose or playback shots. You could instantly switch between optical and electronic viewfinder images with simple "one touch" control.

A year later, FUJIFILM X series cameras grew to include interchangeable lenses. This was the X Mount. It's also interesting that FUJIFILM was committed to APS-C / Super35 digital formats and deliberately skipped Full Frame to simultaneous develop the GFX Larger Format (Medium Format) series of cameras.

X-H2S for Stills

This is the 10th anniversary of the FUJIFILM X Mount. The latest X-H2S model is the most advanced X Series mirrorless camera so far. It excels at both still photography and video. Its APS-C 26.16 Megapixel X-Trans CMOS 5 HS imaging sensor is a stacked, back-side illuminated imager that has a readout speed four time faster than the previous model.

The camera can achieve blackout-free continuous exposures up to 40 frames per second.

Image resolution at low ISO sensitivity compared to the current model[7], while suppressing noise at high ISO sensitivity to produce superior image quality.

The camera's subject-detection AF function uses AI technology to identify animals, birds, cars, motorcycles, bicycles, airplanes and trains for accurate tracking.

X-H2S Video

The FUJIFILM X-H2S camera can record up to 6.2K/30P and 4K/120P video in 4:2:2 10-bit.

The sensor's readout speed during video recording has been reduced up to 1/180th second to minimize rolling-shutter effects.

X-H2S supports Apple ProRes 422 HQ, ProRes 422 and ProRes 422 LT. When recording ProRes, the X-H2S can also provide simultaneous ProRes 422 Proxies.

The camera records to a CFexpress Type B card.

F-Log2 and Fan

F-Log2 expands the camera's dynamic range to 14+ stops.

A heat-dissipating design allows 4K/60P continuous video recording up to approximately 240 minutes.

The optional FAN-001 keeps the camera cool in high-temperatures. It attaches to the rear of the camera body and is powered directly, without a cable.

IBIS, Record, CFexpress Type B

New in-body, five-axis image stabilization gives you the equiva-

Fujifilm X-H2S

FUJIFILM XF150-600mm F5.6-8 R LM OIS WR X-Mount Zoom

lent of a 7-stop gain in exposure time.

A standalone video recording button has been added.

The camera has dual memory card slots: CFexpress Type B and SD cards.

RAW HDMI Output

With an ATOMOS Shogun V or V+ connected via HDMI, the RAW video output from the X-H2S can be recorded as 12-bit Apple ProRes RAW up to 6.2K and framerates up to 29.97 fps. A

When attached to a Blackmagic Design Video Assist 12G, the RAW video output from the camera's HDMI port can be recorded as Blackmagic RAW up to 6.2K and frame rates up to 29.97fps.

FUJINON MK 18-55 T2.9 Super35 X-Mount Zoom

X-H2S Partial Specifications

- Image sensor: 23.5mm x 15.6mm (APS-C)
- Effective pixels: 26.16 millions pixels
- Lens Mount: FUJIFILM X mount
- Shutter type: Focal Plane Shutter
- Mechanical and Electronic Shutter
- Shutter speeds for video:
  6.2K: 1/8000sec. to 1/24 sec.
  DCI4K/4K: 1/8000sec. to 1/4 sec.
- FHD: 1/8000sec. to 1/4 sec.

- Viewfinder: EVF: 0.5 inch OLED, approx. 5.76 million dots
  - Approx. 100% Coverage of Viewing Area
  - Eyepoint: approx. 24mm (from rear of eyepiece)
  - Diopter Adjustment: -5 - +3
  - Magnification: 0.80x with 50mm Lens at infinity

- LCD monitor: 3.0 inch vari-angle Touch Screen Color LCD
  Aspect Ratio: 3:2
  Dots: Approx. 1.62 million dots

- Video recording file size, fps, bitrate:
  6.2K (3:2) 6240 x 4160
    29.97p/25p/24p/23.98p = 720/360/200/100/50 Mbps
  DCI 4K (17:9) 4096 x 2160
  59.94/50/29.97/25/24/23.98 p = 720/360/200/100/50 Mbps

- Film simulation — sort of like a Look Library:
  19 modes (PROVIA/Standard, Velvia/Vivid, ASTIA/Soft, Classic Chrome, PRO Neg.Hi, PRO Neg.Std, Classic Neg., Nostalgic Neg., ETERNA/Cinema, ETERNA BLEACH BY-

FUJIFILM XF 18-120 F4 LM PZ WR APS-C X-Mount Zoom

PASS, ACROS, ACROS + Ye Filter, ACROS + R Filter, ACROS + G Filter, Black & White, Black & White + Ye Filter, Black & White + R Filter, Black & White + G Filter, Sepia)

- Grain Effect — sort of like Textures:
  - Roughness > STRONG, WEAK, OFF
  - Size >   LARGE, SMALL

- Manufacturer's Suggested Retail Price is US $2,499.

Photos by Rainer Hercher

Meet Hugo.

Hugo joins Elsie and Henri in the eponymous family of cine lenses and finders at Ernst Leitz Wetzlar.

Hugo Wehrenfennig, a talented mechanical engineer, helped design many early M Mount lenses and created the original Leica M Mount. Its four-pronged bayonet assembly was essential to Leica's new M3 camera, introduced at Photokina in 1954. The M mount has connected Leica M cameras and M lenses to this day.

Meet Hugo Cine Lenses

September 6, 2022. Ernst Leitz Wetzlar introduces the Leitz Hugo series of cine prime lenses. The initial set of 7 consists of 21, 24, 28, 35, 50, 75, 90 mm — all T1.5. There is an additional 50mm T1.0 lens in the series. They are expected in Q1 2023.

Wait, wait—don't these focal lengths sound familiar? Yes. Hugo is based on the same optics as Leica M 0.8 lenses, which in turn are mechanically modified versions of the classic, iconic Leica Summilux and Noctilux M mount lenses.

As anyone who loves Leica M lenses knows, they are almost impossible to find in PL mounts. It's a matter of diameters and depth. M lens mounts have a 44 mm inside diameter, a flange focal depth of 27.8 mm, and average 55 mm in length. PL mounts have a 54 mm diameter and 52 mm FFD. Therefore, about 80% of an M lens would wind up inside the PL mount itself, if it fit at all. You wouldn't even have access to the focus or iris rings.

The workaround up to now has been a dedicated M mount screwed onto your ALEXA, VENICE or RED camera. But then you wind up swapping mounts to use other lenses.

"We had to wait for the LPL mount and see how it was accepted in the industry," said Rainer Hercher, Managing Director of

Ernst Leitz Wetzlar. "Once we saw it had legs, we designed Elsie primes with LPL mounts. The advantages were clear: shorter flange focal depth and benefits for wider angle lenses.

"There were several reasons to introduce Leitz Hugo prime lenses: the beauty of Leica M lens images, the success of our M 0.8 series, and the opportunity to make dedicated cine lenses using beloved M lens elements."

Hugo lenses have the same optical design and internal glass elements as the Leica M series. The glass and coatings remain unchanged. It's the mechanical design that is completely new. Focus mechanisms use cam followers instead of threads. Close focus is much closer. The front diameter of all Hugos is 95 mm. Focus marks are spaced with focus pullers in mind. Hugo lenses are super lightweight and small. Most of them weigh less than 1 kg.

The initial Hugo set will expand with additional 18mm and 135mm lenses designed in close partnership with Leica.

Hugo lenses will have user-swappable options of LPL, Leica M or Leica L Mounts. And, existing owners of M 0.8 lenses can have the lenses converted at the factory to Hugo lenses. Price and availability of this conversion is to be determined.

There's a historical precedent to this munificence. In an article "How Leica Bayonetted its Customers Without Screwing Them: The Curious Ins & Outs of Leica Screw-to-M Mount Adapters," Jason Schneider wrote: "Hugo Wehrenfennig, the man who designed the iconic 4-lobed bayonet M mount also devised the simple but sophisticated Leica screw-to-M Mount adapter. The adapter lets you mount almost any Leica Thread Mount (LTM) lens on a Leica M body, retaining full functionality...and a stunning example of non-obsolescence that demonstrated Leica's commitment to its loyal customers who had purchased thousands

Hugo

of screw mount Leica cameras and lenses as far back as 1930.

"It was Hugo Wehrenfennig's idea to reduce the flange focal distance of the Leica M system to 27.8 mm, which is 1 mm shorter than the 28.8 mm distance in previous LTM screw mount Leicas. Hugo deserves his own statue beside Oskar Barnack and Hektor, Max Berek's dog." (Max Berek was Leica's legendary lens designer starting in 1924 and several lenses were named after his dog.)

Extremely Light and Incredibly Close

Cinematographers have been dreaming of lenses like these since the days of Berek and Barnack and Hugo Wehrenpfennig. Leitz Hugo Cine Primes fullfil these expectations with production-ready mechanics, solid LPL mounts, and closer focus than was ever achieved in the original M lenses from which they descend.

Focus and iris barrels are where you want them. Expanded focus scales rotate the expected 270°. Iris barrels rotate 70.5°. These are significant achievements over M 0.8 lenses, whose lens marks were sarcastically said to be so close together you could change settings by merely wishing it to be so.

The exuberant one-line pitch is this: "Extremely light and incredibly close, very small and very fast, constant companions that you can put in a carry-on bag or carry in a backpack everywhere you go, for every imaginable setup, from studio to Steadicam, gimbals to geared heads, drones to dramas."

The Look

Oskar Barnack's 1913 Ur-Leica, introduced at the Leipzig Fair in 1925, was the Ur-Mirrorless camera and lens system of its day. The legacy of incredible lenses for those Leica "mirrorless" cameras can be credited to three of the company's notable opti-

cal designers: Max Berek, Walter Mandler and Peter Karbe, and many others on the design team.

What do these ancient, vintage and modern Leica lenses look like? A common theme runs through: sharp eyelashes, silky smooth skin tones, glimmering bokeh, Purkinje effected greens in lush forests, made even more vivid with Summilux M lenses, a difficult to describe three dimensional look, and stunning portraits.

Rainer Hercher describes Leica M lenses—and the new Hugo series: "Hugo is the artist in the Leitz family of Full Frame lenses. Their history is from the 2000s to 2022, with a 90-year heritage, in a modern housing. Hugo primes are very fast and super sharp in the center. They have a pleasing fall-off toward the edges, with a painterly balance of focus, out-of-focus areas and field curvature. Slight distortion and aberrations are not overtly overly-corrected out. Bokeh may contain rainbow colors. Flares are gorgeous. Many of us grew up with iconic Leica images. You rarely find a DP shooting a movie with just one set of lenses. Now you can shoot with crystal clear Leitz Primes, easy-going Elsie, and now with the special look of Hugo."

Anthony Lane, film critic for The New Yorker, wrote, "Even if you don't follow photography, your mind's eye will still be full of Leica photographs. The famous head shot of Che Guevara was taken on a Leica with a portrait lens—a short telephoto of 90 mm—by Alberto Díaz Gutiérrez, better known as Korda, in 1960. Still, why should one lump of metal and glass be better at fulfilling that duty than any other?"

As Antoine de Saint-Exupery said, "Perfection is achieved not when there is nothing more to add but when there is nothing left to take away."

Leitz Hugo Lens	21	24	28	35	50	75	90	50-N
Focal Length	21mm	24mm	28mm	35mm	50mm	75mm	90mm	50mm
Aperture	T1.5	T1.5	T1.5	T1.5	T1.5	T1.5	T1.5	T1
Close Focus (ft)	1'	1'	1'2"	1'2"	1'8"	2'6"	2'10"	1'8"
Close Focus (m	0.3	0.3	0.35	0.36	0.5	0.75	0.85	0.5
Weight (lb)	1.85	1.9	1.83	1.78	1.9	3.2	3.04	2.45
Weight (kg)	0.84	0.86	0.83	0.81	0.86	1.45	1.38	1.11
Length (in / mm)	2.7"	2.7"	2.7"	2.7"	2. 7"	4.4"	4.4"	3.2"
Length (mm)	68	68	68	68	68	112	112	82

Image Circle:	43.3 mm
Lens Mount:	LPL, Leica M, Leica L Mounts
Front Diameter:	95 mm
Front Filter:	M 92 mm x 1 screw-in
Gear Rings:	Matched locations for all focal lengths
Focus Rotation:	270°
Iris Rotation:	70.5° (except 50-N rotates 81°)
Focus Scales:	Imperial or Metric, easily swapped
Iris:	11 Blades, Circular Shape

Leitz LPL Mount for VENICE

Leitz Hugo prime on Sony VENICE with Leitz LPL Mount

Leitz LPL Mount for Sony VENICE

What is a DP or Rental House to do? You have a new set of Leitz Hugos or Elsies or other LPL mount lenses and want to use them on a Sony VENICE or VENICE 2. But VENICE cameras only come with a native E-mount (below left) and a PL mount that screws in front. (ARRI Cameras have LPL mounts.)

Now, Leitz has designed and built an LPL mount for Sony VENICE and VENICE 2. It fits in place of Sony's original PL mount and attaches with 6 screws. Lens metadata is fully functional; /i data is recorded directly by VENICE.

The Leitz LPL Mount for VENICE, combined with a Leitz LPL to PL mount adapter, creates a system so solid that you would hesitate to even call it an adapter. It ensures consistent pass-through of /i metadata. And, it enables a painless and quick way to work with both LPL and PL lenses on the same job and saves lots of time on set.

By the way, Leitz already has an M Mount for Sony VENICE.

Leitz LPL Mount for VENICE, rear side that connects to the camera. Notice the pogo pin contacts that pass metadata through from the lens to VENICE.

Sony VENICE 2 native E-mount

Leitz LPL Mount for Sony VENICE, forward side. Attaches in front of VENICE's E-mount with 6 screws.

Leitz LPL to PL Mount Adapter, front side.

Leica M11, the latest in the long line of M cameras, was released earlier this year. Aforementioned Hugo M Mount lenses will fit directly and LPL Hugos attach with Leitz's LPL to M adapter.

Of course, M11 is a rangefinder camera, so to compose and focus Hugo lenses, you want Leica's Visoflex 2 EVF that slides into the hotshoe on top.

M11's Leica Format (Full Frame) 9528 x 6328 pixel (60.3 MP) BSI CMOS sensor has a 3.76 μm pixel pitch. One of the most interesting features of M11 is its Triple Resolution Technology. DNG and JPEG still image files can be captured at 60, 36 or 18 Megapixels, using the entire sensor area for each resolution.

The vestigial brass baseplate of analog M cameras was vexing to a number of users in the transition to digital. M11 has direct access to the SD card and battery. In addition to the SD card slot, Leica M11has 64 GB of internal storage.

Leica M11 decisively shoots stills only. For video, please look at the Leica SL2-S, on the next page.

Visoflex 2 electronic viewfinder has a 3.7 Megapixel OLED display. Leica M cameras do not have an adjustable diopter eyepiece. However, Visoflex 2 adjusts from -4 to +3 diopters. It also tilts from horizontal to 45° and 90° vertical.

Bottom

Top

Leica SL2-S with Atomos NINJA V and V+

Leica SL2-S with native L Mount

Leica SL2-S with Leitz LPL to L-Mount Adapter

If you want to shoot video and stills with your new Leitz Hugo cine lenses, then consider the Leica SL2-S. Its native L-Mount (20 mm Flange Focal Depth. 51.6 mm I.D.) accepts both LPL and M Mount adapters.

Leica SL2-S has a Leica Format (Full Frame) 24.6 MP, 5.94 µm pixel pitch sensor with 5-axis in-body Image Stabilization. Its Electronic Viewfinder is one of the best: 5,760,000 dots, 120 fps, 0.78x mag; 4:3 aspect ratio; 21 mm exit pupil position; +2 to -4 diopters; 0.005 s latency.

The SL2-S records internal Full Frame, C4K (17:9) 4096 x 2160 video (downsampled from 6000 x 3168) as MP4 (H.264/MPEG-4 AVC) or MOV (H.264/MPEG-4 AVC).

ATOMOS NINJA V and V+ Support

ATOMOS announced a strategic partnership with Leica for the SL2-S to record ProRes RAW via its HDMI output.

When connected to the ATOMOS NINJA V or NINJA V+, the Leica SL2-S can record 4K, 12-bit linear ProRes RAW up to 60 fps. The Leica SL2-S and the NINJA V/V+ provide a high-end, hybrid, compact package that can go almost anywhere.

NINJA V and V+ have a bright, 5.2" 10-bit 1000 nit HDR display. You can choose between HLG and PQ (HDR10) standards. The 5-inch 1920x1080 touchscreen lets you summon up software tools that include waveforms, false color, focus-check, frame lines, LUTs and image magnification.

Both ProRes RAW, and the higher bandwidth, less compressed ProRes RAW HQ are supported. Manageable file sizes speed up and simplify file transfer, media management, and archiving. ProRes RAW is fully supported in Final Cut Pro, Adobe Premiere Pro and Avid Media Composer and other apps, including ASSIMILATE SCRATCH, Colorfront, FilmLight Baselight and Grass Valley Edius.

Check for downloadable firmware updates to the Leica SL2-S and the ATOMOS NINJA V/V+

ATOMOS NINJA V

Leica SL2-S

RED V-RAPTOR XL

Stop the presses. Here's an exciting new camera from RED.

August 23, 2022. RED DIGITAL CINEMA launched their eagerly-anticipated V-RAPTOR XL 8K VV camera.

I should have expected this. It's been almost a year to the day since RED's V-RAPTOR released on Sept. 1, 2021. Scrambling to include this breaking news, here's a short summary. More details will follow.

V-RAPTOR XL is the new, flagship, system camera ready for almost any production setup. You can think of the V-RAPTOR XL as a V-RAPTOR with almost every conceivable connector, accessory and mounting point built in or out. The things that caught my attention first were the two handgrip Hirth-tooth rosettes where they belong on the camera left and right sides of the body.

As with the V-RAPTOR, V-RAPTOR XL has an 8K VV/Full Frame and 6K Super35 multi-format sensor. That means Full Frame lenses cover the full 8K large format image area. Super35 lenses cover a 6K image area.

As with DSMC2 cameras, four screws in front let you change the stock PL mount to M, LPL, PV, EF, etc. (Note that V-RAPTOR has a lever-locking RF mount and you use lens mount adapters.)

What are the other major differences? It comes down to style of shooting. V-RAPTOR is modular, smaller, lighter, like a sports car. V-RAPTOR XL is the "studio" version, more like an SUV of cameras.

V-RAPTOR XL 8K VV

The V-RAPTOR XL sensor has the widest dynamic range and cleanest shadow performance of any RED camera. Sensor scan time is two times faster than previous RED cameras and lets you shoot up to 150 fps at 8K 2.41 and 600 fps in 2K 2.4:1.

V-RAPTOR XL has:
- Internal Clear to Electronic ND with 2 to 7 stops of exposure control in ⅓, ¼ or 1 stop increments.
- Familiar REDCODE RAW settings of HQ, MQ, and LQ.
- Dual Voltage 14/26V V-Lock or Gold Mount battery interface.

- Interchangeable PL and locking EF mounts with lens data.
- Wireless timecode and Genlock via Ambient ACN
- Remote camera control using RED Control (free) or RED Control Pro apps.
- Front-facing 3G-SDI, 2-Pin 12V and two 3-Pin RS 24V accessory power ports.
- GIG-E connector for camera control and PTP Master Clock synchronization.
- Phase-detect autofocus options.
- 3-stage cooling system with thermoelectric heat exchanger
- Body: 8.5× 6.5 x 6" and about 8 lb with lens mount and battery plate. (V-RAPTOR is 6 × 4.25 × 4.25" and weighs 4.03 lb.)

Jarred Land, RED Digital Cinema president, said, "The XL is one of the most innovative cameras we've launched, and I'm excited to get it into filmmakers' hands. The XL builds off our mighty V-RAPTOR and adds more outputs, additional power flexibility and an incredible internal ND system. The entire RED team is so proud of the advancements this brings to cinematographers, and we can't wait to see what they create."

The camera body is available in V-Lock or Gold Mount and costs $39,500. RED worked closely with Angelbird, Core SWX, and Creative Solutions to produce the accessories included in the Production Pack. These will also be available to order individually from RED or authorized RED dealers.

The Production Pack, also available now, is $49,995. It includes:

- V-RAPTOR XL camera body.
- DSMC3 RED Touch 7.0" LCD Monitor with DSMC3 RMI Cable (18") and Sunhood.
- REDVOLT XL-V (or XL-G) Batteries.
- RED Compact Dual V-Lock or Gold Mount Charger.
- RED Pro CFexpress 2TB cards and card reader.
- V-RAPTOR XL Top Handle with extensions.
- V-RAPTOR XL Riser Plate.
- V-RAPTOR XL Top and Bottom 15mm LWS rod brackets.
- DSMC3 RED 5-pin to Dual XLR adapter

RED V-RAPTOR XL

EVF
2-pin 12V DC AKS Pwr

Internal ND/Clear
UP
DOWN

Hirth Tooth Rosette

USB   2-pin 12V DC AKS Pwr
SDI-1   2-pin 12V DC AKS Pwr
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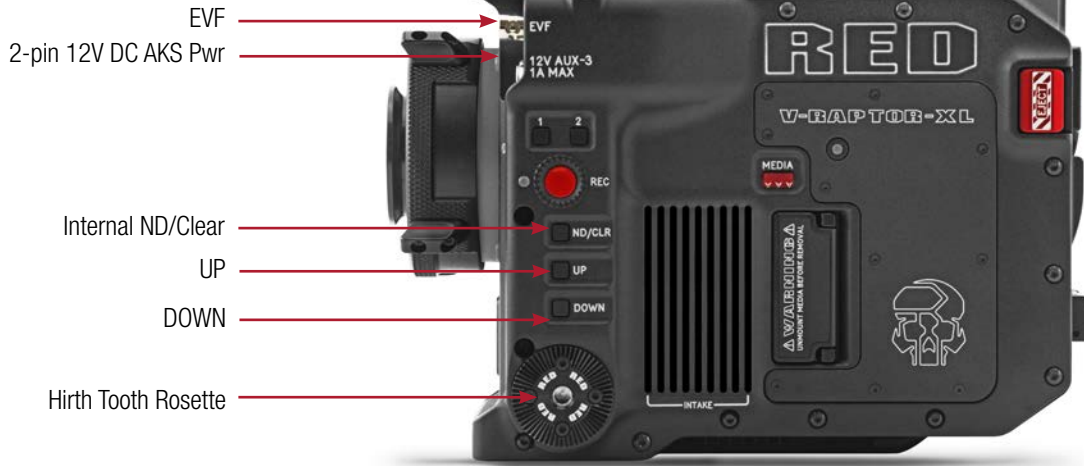
RED V-RAPTOR XL

PL Mount

EF Mount

Top

Bottom

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IMAGO EUROPEAN FEDERATION OF CINEMATOGRAPHERS For the art of Cinematography · CAMERIMAGE · ICG · CineLenses · SOCIETY OF CAMERA OPERATORS · Broadmedia & Entertainment Inter BEE · airstar · ibc

Titans of the Industry

SONY   Leica   ARRI

Canon   Blackmagicdesign   CREATIVE SOLUTIONS

DJI PRO   Cooke   TIFFEN

Moguls

CVP   AJA VIDEO SYSTEMS   Leitz   ZEISS

RED   FUJIFILM FUJINON   SIGMA   angénieux

TERADEK   PRESTON CINEMA SYSTEMS   bandpro FILM & DIGITAL INC.   ATOMOS

Executive Producers

Emit   PANAVISION   lowel   WOODEN CAMERA   SMALLHD

AbelCine   SERVICE VISION   Litepanels   oconnor   STEADICAM

Producers

C&L RENTAL   ATLAS LENS CO.   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

CINEPADS   AATON DIGITAL   ORCA   P+S TECHNIK   THE STUDIO B&H PHOTO · VIDEO · PRO AUDIO

sachtler   Manfrotto Imagine More   Mole-Richardson Co.   matthews studio equipment TECHNOLOGY THAT COMPLEMENTS YOUR IMAGINATION   CINEMATOGRAPHY electronics

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