Jon Fauer, ASC www.fdtimes.com Mar 2023 Issue 119

FILM AND DIGITAL TIMES

Art, Technique and Technology in Motion Picture Production Worldwide

FILM AND DIGITAL TIMES

Art, Technique and Technology

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

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

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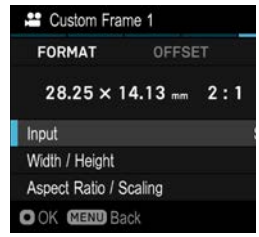
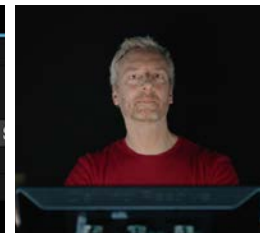
Cover:

SmallHD Research, Development and Manufacturing Headquarters in Cary, NC as viewed with EL Zone Exposure System on a SmallHD Monitor.



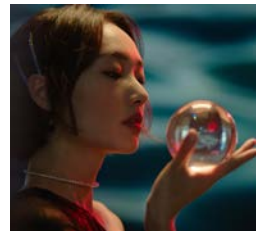













Imagine the inducements to visit SmallHD in Cary, North Carolina. Haute cuisine and haute technology, not in that order. For sure, we're here to explore the high technology of SmallHD. More later on the one of the best restaurants in the South Atlantic region of the United States.

It's an easy 2-hour flight from New York's newly renovated La Guardia Airport to Raleigh-Durham. From there, take a cab or car to Cary, NC, and the high-tech headquarters of SmallHD. You're in Research Triangle territory and the campuses of Duke, UNC-Chapel Hill, and NC State University. Apple, Google, Toyota, IBM, Cisco, Amazon, Epic Games, Qualcomm and Red Hat are among the many high-tech companies neighboring high-tech SmallHD.

A bit of backstory. Once upon a time, Greg Smokler was a camera assistant and DP. Tim Malooly was a producer and production manager. With that practical experience, they built Paralinx—the wireless video company beloved for its tiny transmitters and reliable receivers—into a major player on set. Paralinx was quickly acquired by Teradek, one of the Vitec—now Videndum—companies, and folded into what is now known as the Creative Solutions division.

Today, Greg Smokler is Director of Cine for Creative Solutions and Tim Malooly is General Manager of SmallHD. They are both part of the reasons why SmallHD monitors are so popular with cinematographers, camera assistants, DITs, directors and crews—practical experience on set and an understanding of the customer. When an AC asks for a Hirth-tooth mounting bracket for their Cine 7, these characters know the vocabulary.

SmallHD has grown into a formidable company that makes monitors you see everywhere, from affordable 5-inch displays that sit atop hybrid mirrorless cameras to large reference monitors in grading suites. There's hardly a camera assistant anywhere who is not focused on a SmallHD monitor. They float on Steadicams, sit on DIT carts, stand in video villages and are, by now, pretty much standards of the industry.

It wasn't always so. SmallHD was founded in 2007 by Wes Phillips and Dale Backus, two innovators creating video content at the dawn of the "digital revolution." They were making films and commercials, shooting on DSLR cameras, and could not find small on-camera monitors that fit their new nimble way of working in the digital age. They built SmallHD's first monitor, the DP1— I think it was in their garage, as with most startups.

Today, SmallHD occupies a beautiful sprawling facility in a wooded, park-like location. About 90 people work here, in addition to CS divisional staff around the world. SmallHD monitors are designed, built, and shipped from this headquarters in Cary, North Carolina. The product line has grown substantially. The company continues to build products that address the ongoing question: "Here's the shot, here's what we need. Of course, what we need is needed this afternoon."

As I wrote a few months ago, SmallHD monitors are not just small, not just HD, and not just for Focus Pullers. They are 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.

All SmallHD Cine Monitors, from 5 to 27 inches, have rugged, unibody, milled-aluminum housings. They all have lots of 1/4-20 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. There are monitors designed for almost every user.

SmallHD is a part of the Creative Solutions Division of Viden-

dum plc. Wooden Camera and Teradek are also part of Creative Solutions, and Anton/Bauer is also in the Videndum family. So there's a lot of synergy and sharing of engineering prowess.

There's even a Creative Solutions center in Burbank, California (CSLA) where you can kick the tires of a DIT cart and try out various SmallHD and Videndum products.

Design and Development

I'm swept away on a guided tour of SmallHD by Greg Smokler, Tim Malooly, and Blake Johnson, the Director of R&D. They act as chaperones, curators, docents.

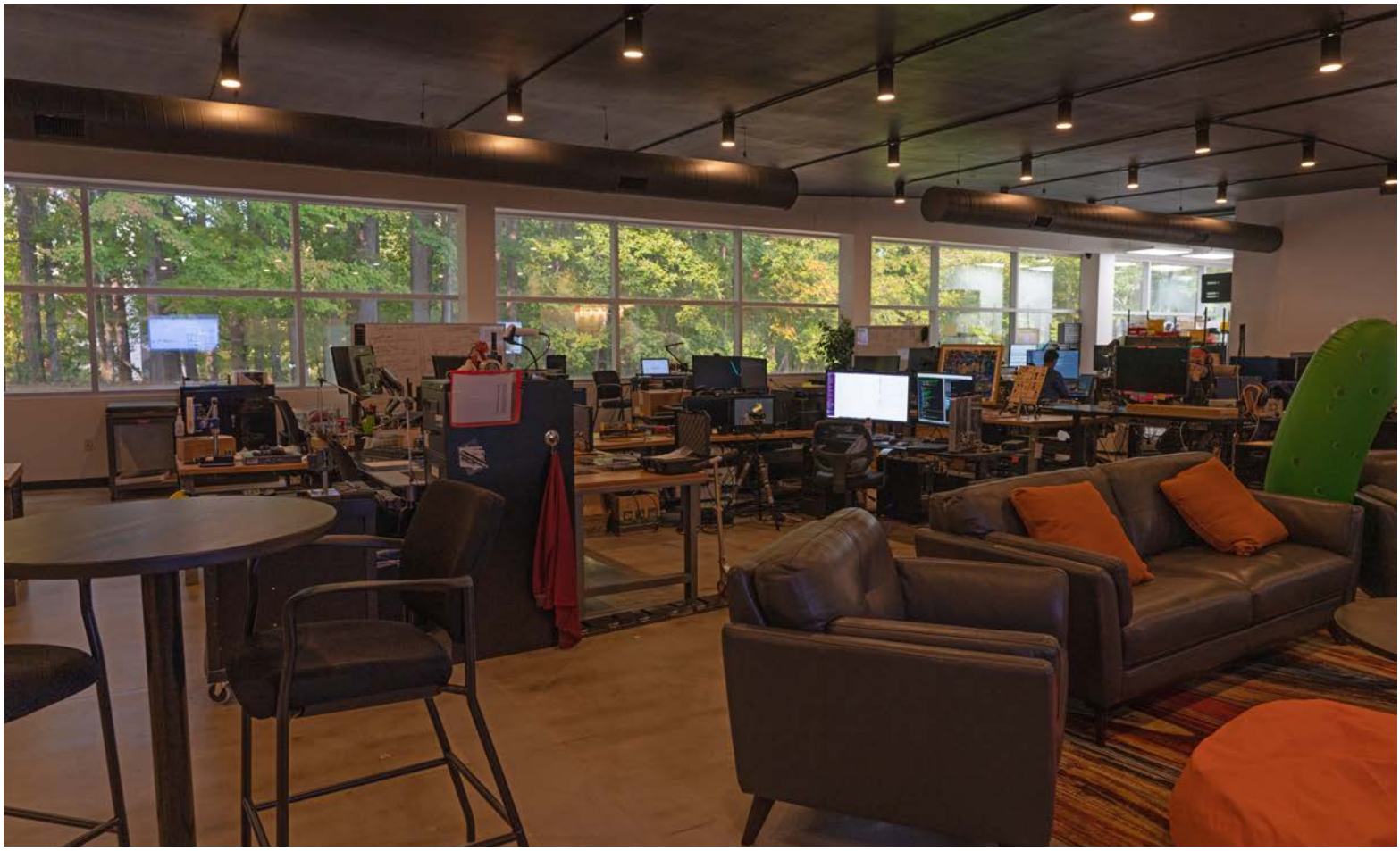
All the design and development is done here in North Carolina. The mechanical engineering team mills aluminum, molds and 3D-prints plastics into prototypes. They work with the Creative Solutions team in Irvine, CA, on industrial design.

In the panoramic engineering bullpen, the electrical engineers sit adjacent to the software developers and the FPGA team. Field Programmable Gate Arrays provide hardware speed with the flexibility of software. All of the video processing is managed within the FPGA.

An extensive testing lab with a thermal chamber subjects the monitors to extreme temperatures and humidity. There is a wall of monitors where firmware updates are tested on one or two samples of every monitor currently supported by SmallHD—the roster goes back nearly 10 years and includes dozens of models. The upload process onto the monitors is automated to ensure continued viability with all the different formats and flavors of video, resolution, and frame rates. It's a constantly evolving software update.

Jeffrey Gray, manager of the software team, said, "We're constantly releasing new software features and we use this set-up

Above: Tim Malooly, General Manager of SmallHD.
Below: software development area.



to make sure that we're not breaking things. Once the software is stable and we have a candidate for release, then we can do manual testing as well. We have an inventory of most cameras that our monitors are used on and we try to test all of them."

Barrett Phillips works on the Graphical User Interface (GUI) design. He's also a DP. After the first prototype is ready, Barrett goes on location to actually film with it. He then returns with comments, criticism and suggestions for refinement.

A major piece of the R&D process into which SmallHD has been putting a lot of time and energy is color science. It is an alchemy of aesthetics, art and lots of science. Greg Smokler explained, "We're essentially trying to hit established specifications and get as close to perfection as possible. We approach the problem with mathematical models, probes, and calibration tools, but the technology itself often requires love and tenderness to get close to the ultimate specification: the eye of a cinematographer."

Mike Claes, Director of Color Science and Analytics, said, "Part of the challenge when you use calibration tools, probes, and programs is translating the numbers into what people are really seeing. So it's a mix of testing by the numbers and also coming in here, looking at the monitors and determining what we see when the numbers change."

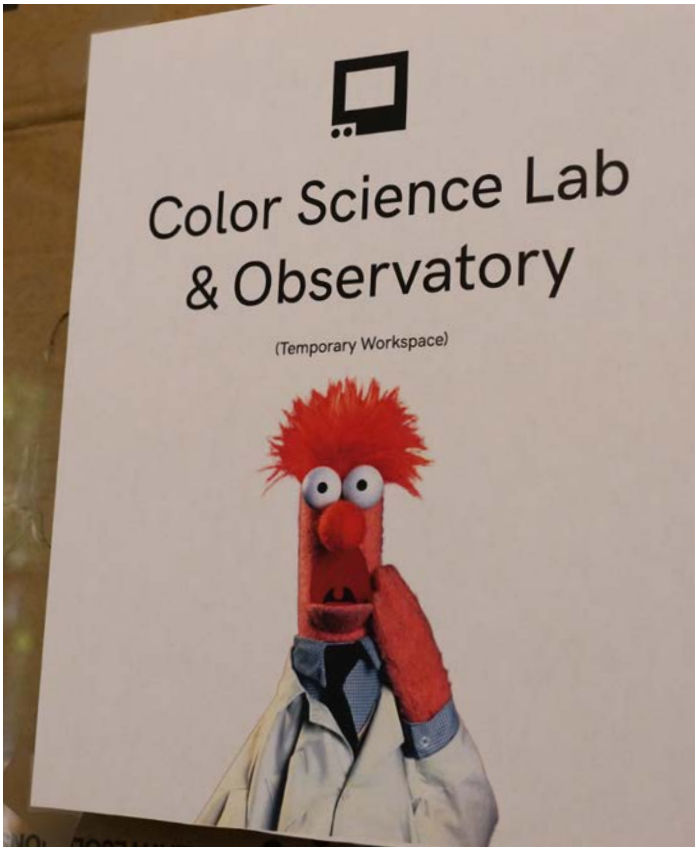
"For example," said Greg, "What is white? There are nearly infinite options for choosing a color temperature for your white point. There is a different standard in Japan than in the US. This is not even new to digital—Fujifilm looks different from Kodak. That has an impact on everything else that you see—every color, every value. And then Mike can tell you about observer metamerism."

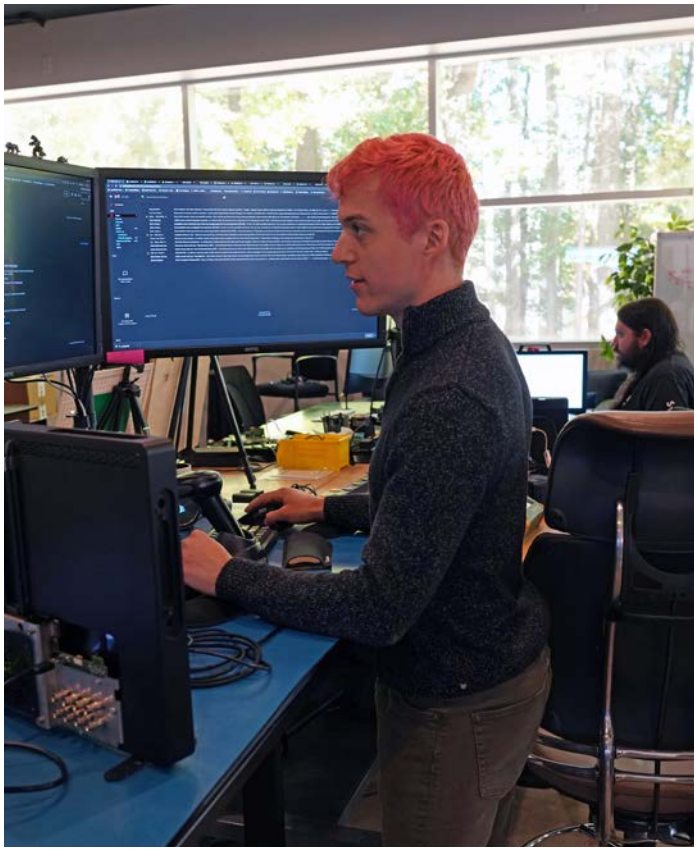
Mike explained, "Observer metamerism is how different people may have different perceptions of the same light source. Different display technologies have different spectral power. The original work on that was done in 1931: the CIE (Commission Internationale de l'éclairage) XYZ color space was a measurement of human color perception and still is a basis for color spaces underlying most color management systems. Of course, much additional work has been done.

"Nevertheless, an OLED monitor can have very specific peaks, particularly in the red, green, and blue spectrum. And then you have an LCD that is a little bit broader. Even though a probe might show the same numbers, the same values, you perceive those colors differently when you physically look at it—which can be incredibly confusing and frustrating!"

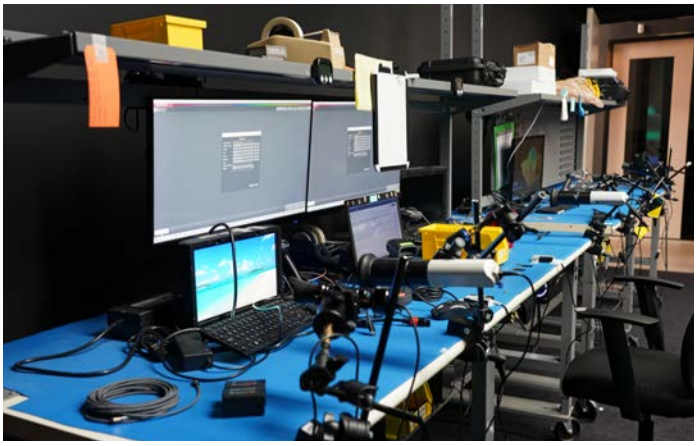
We walk to the assembly area. Teams are putting together everything from 5-inch to 27-inch monitors at various assembly stations. The work stations are flexible to accommodate different sizes, parts, and caliber of product. The number of monitors coming out of this area is impressive.

After assembly, software is loaded. Next comes quality control, then burn-in, calibration, and another round of quality control. Some monitors stay on burn-in for three to five days. Color and brightness values are repeatedly verified. And finally, the SmallHD monitors are packed and ready for shipping. The entire process takes a lot of time, a lot of care.

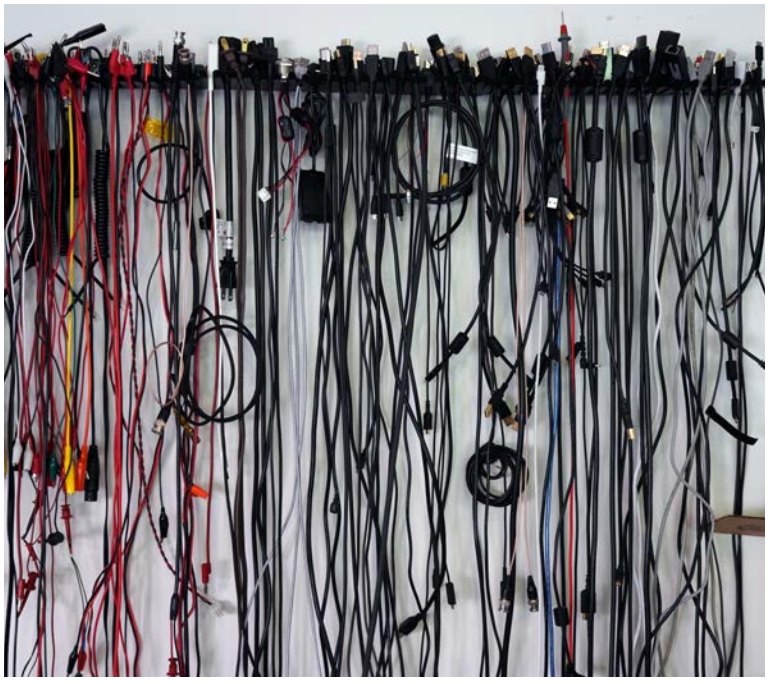


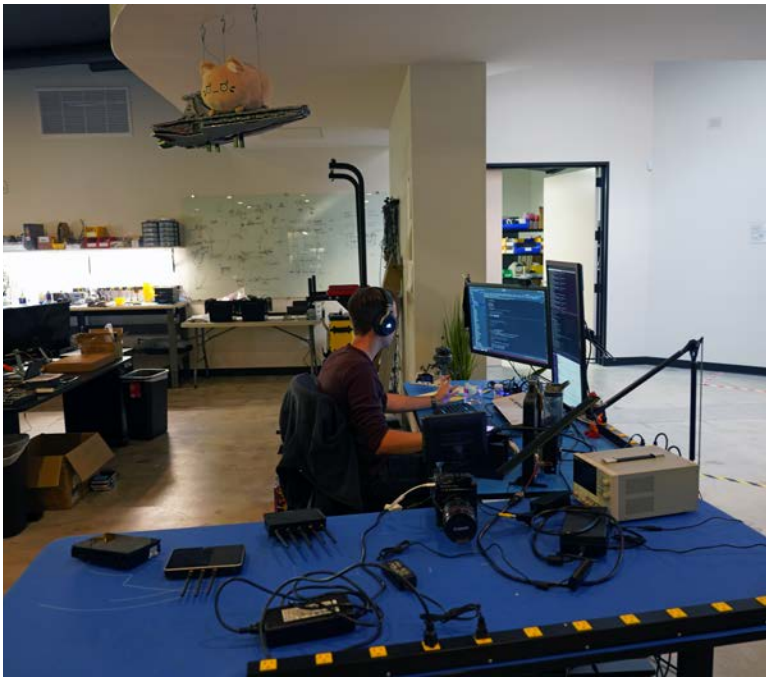


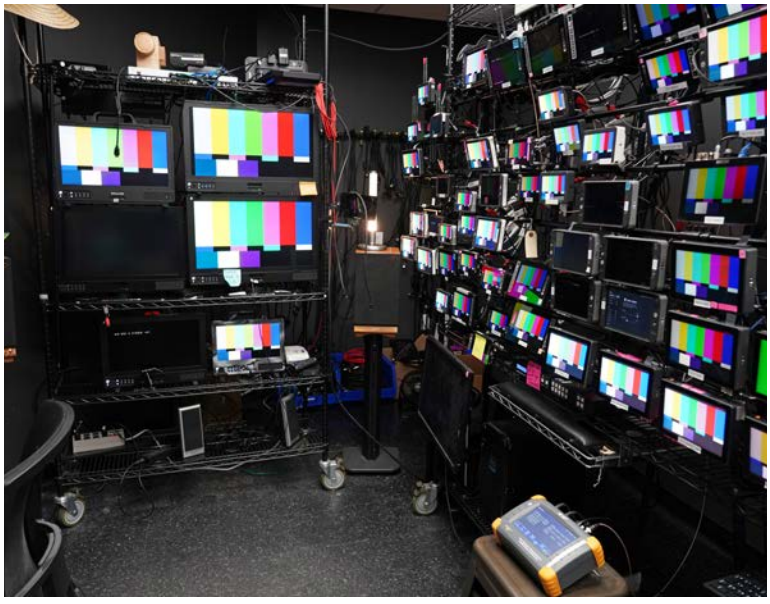
Above: Jeffrey Gray, Software Manager.
Below: (L-R) Mike Claes, Director of Analytics and Color Science, Scott Day, Developer

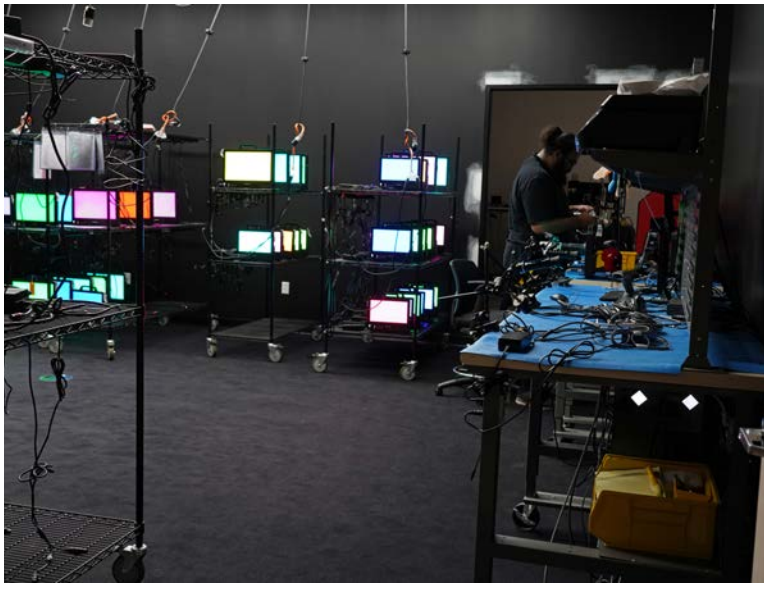


SmallHD Testing

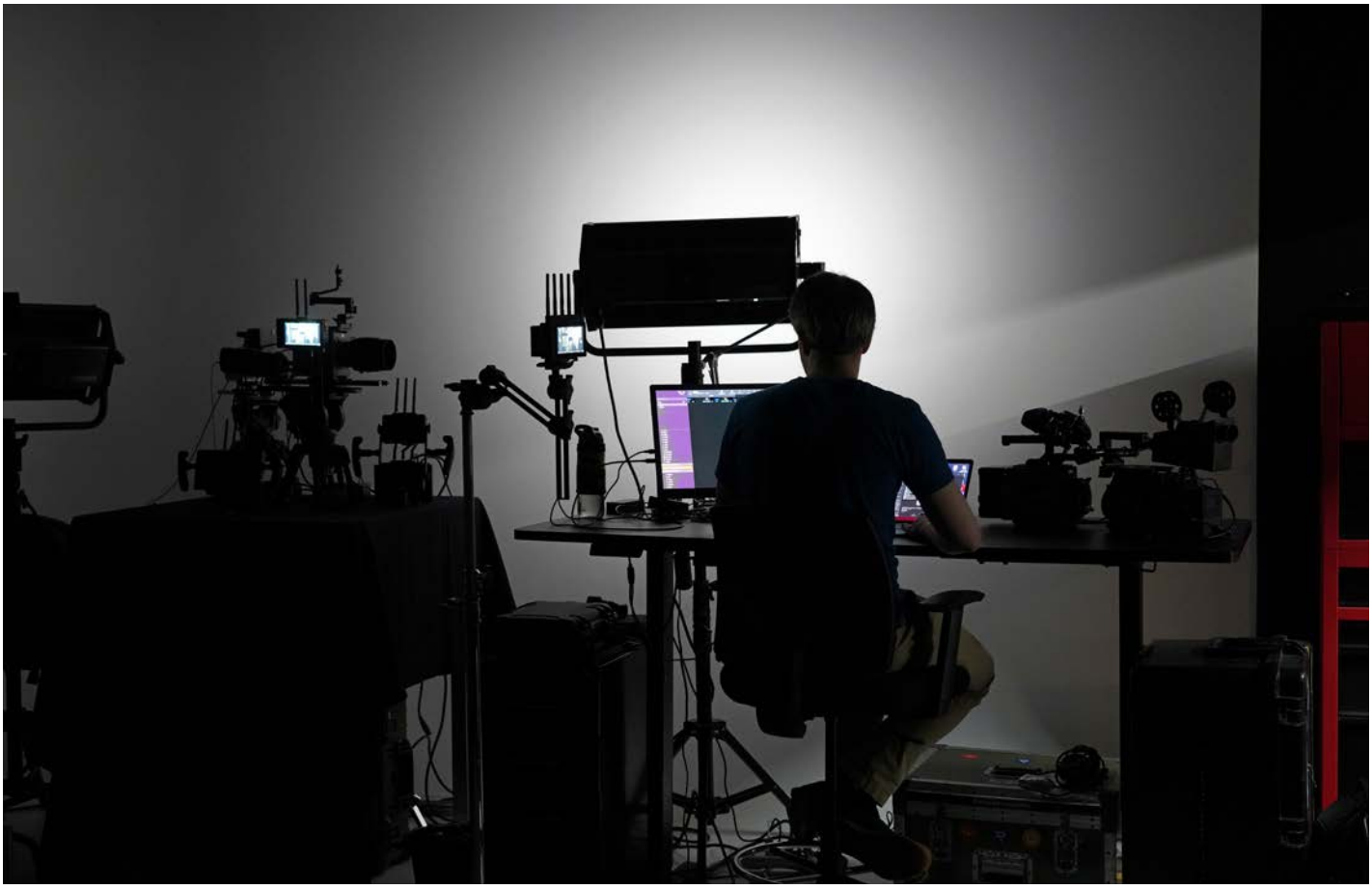




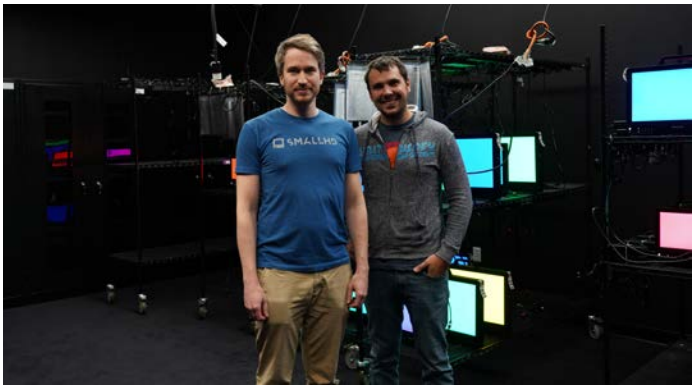




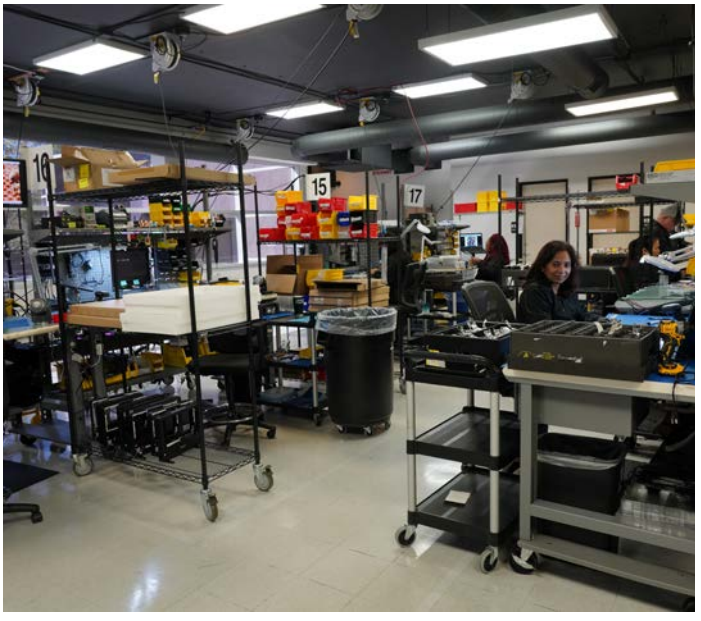
SmallHD User Interface and Development

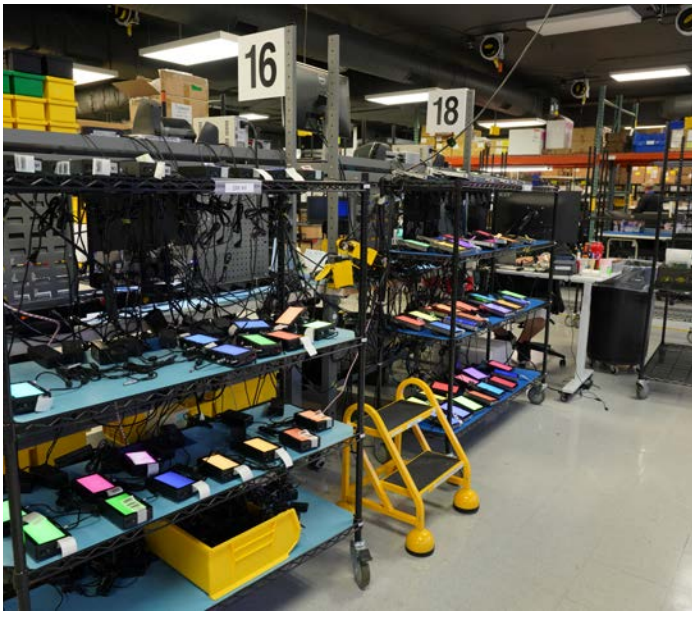


Barrett Phillips (User Interface Designer) above and below left, with Kaleb Droskiewicz (FPGA Engineer) at right.

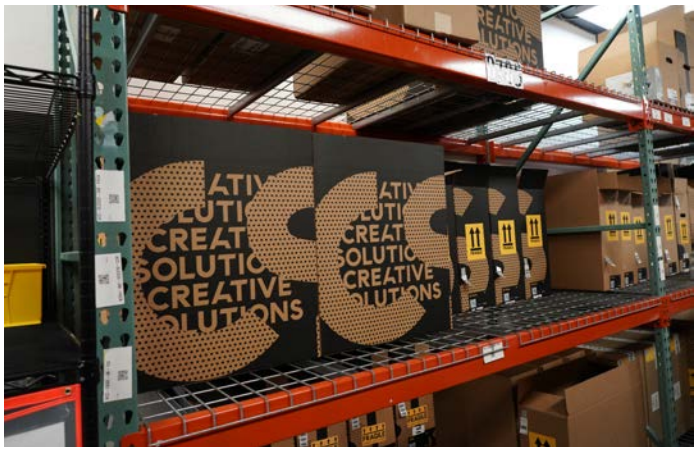


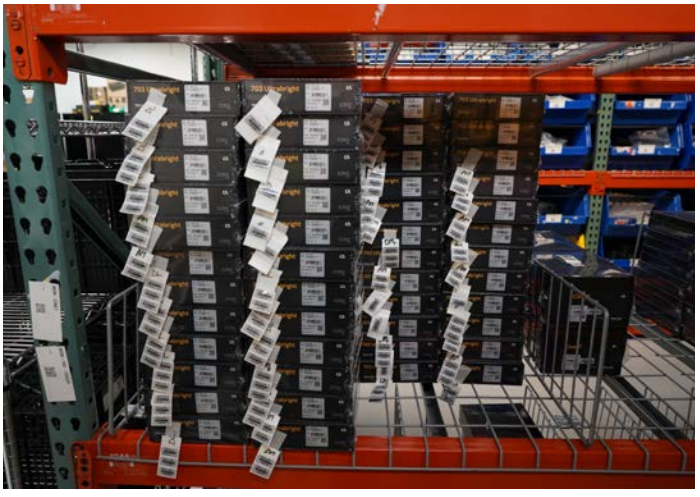
SmallHD Manufacturing



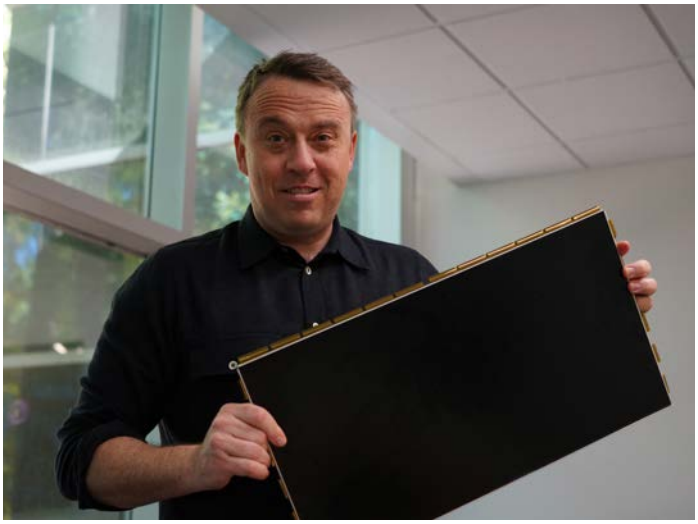


SmallHD Ready to Ship





Greg Smokler and Blake Johnson



Greg Smokler, Director of Cine for Creative Solutions.

Blake Johnson, Director of Research and Development at SmallHD.

Blake Johnson, Director of Research and Development at Small-HD, and Greg Smokler, Director of Cine for Creative Solutions, discussed monitor design and SmallHD technology.

What does your job involve?

Blake: Leading talented people to deliver great products. We have a great group of people here who are very excited about what they're doing and excited about the product. So for the most part, it's about giving clear direction, making sure we all know what we're doing, and then all running in the same direction. We have mechanical, electrical, FPGA, software, color science, testing, and QC engineers. It takes a diverse team to put these monitors together.

I never knew a monitor was so complicated.

Blake: A lot of people think it's just a panel. You can go out on the gray market and buy a panel. It's the magic that we add to it—durability, color fidelity, user interface, ergonomic design. From a mechanical perspective, quality is very important. You can make a cheap mechanical enclosure, but then it's not going to really survive on set or on top of a camera. The mechanical engineers sometimes are the unsung heroes. Starting on the outside, adding all the attachment and mounting points—there's a lot of work that goes into getting the mechanicals correct.

The software is equally important. It lets you turn the monitor on and off quickly. The PageOS tools are intuitive and let you maneuver through all the things that you have to do. Those tools add value to the panel. Whether it's color, focus assist, exposure assist, EL Zone—that's all software. We really spend a lot of time on the PageOS interface. Our primary User Interface designer, Barrett Phillips, is also a cinematographer. He's the brother of one of the founders and has been with us from day one. His other brother, Graham, is here as well. Graham started out building monitors and supporting them. He was the head of assembly for a while, then he came over as my technician, and now he's a mechanical engineer. They both have a brilliant feel for the products, for the customer's needs, and what makes a monitor practical from an actual user's perspective.

Greg: There's a critical mass of tribal knowledge here. As you were saying, you want to find technical people who are passionate about the products. I don't want to be hyperbolic, but what is magical for me is, for instance, to realize that Jeffrey Gray, our lead software developer—an extremely technical person responsible for making the monitors function—is incredibly empathetic to the end-user's experience with our monitors. Through his collaboration with Russell and Barrett, with the product teams, and with the end-users, for all the years that he's been here—he really is the author of how easy it is to use the powerful features of our monitors.

How do you get ideas from users and then implement those requests?

Blake: The Product Management team spends time with the customers and comes to us with ideas. Then I discuss those ideas with our engineering team, including Jeffrey Gray, the brilliant and dedicated software manager, and Russell Hocken, our lead architect. We bat ideas around in terms of ability to deliver, time to market, cost, and those kinds of things. Ultimately we boil it down to a prioritized product list, then move those through the product development process. Essentially, my focus is not to figure out what the next product is; that's product management. My job is to deliver on the promises that they want to make to the customers.

Who are the product managers?

Blake: Here in Cary, it's Dave Bredbury, who kind of grew up with SmallHD, and is now the lead Product Manager. In the LA office: Greg Smoker (sitting right here), Colin McDonald, and Dominick Aeillo.

Since you share common technologies and parent company, how do you work with the teams at Teradek, Wooden Camera and Anton/Bauer?

Blake: Dominick Aiello at Wooden Camera designs a lot of our battery plates. Obviously, we work closely with them from an interface perspective as far as how they're going to attach things to the monitors. And we work with Anton/Bauer so the batteries can communicate directly with the monitor. The new Smart

5 series of monitors also uses the Anton/Bauer Micro Gold or V-Mount battery design. And, of course, Teradek integrates their wireless video systems.

Who works with the camera manufacturers? Since some of your monitors control the cameras nicely, do you get plans and protocols before the camera is even released? A good example might be the ALEXA 35. When I was testing one of the first models, it just plugged in seamlessly to your Cine 24 monitor. It was able to apply a log transform effortlessly.

Greg: Strategically and philosophically, we try to be supportive of cameras. We are camera agnostic—no favorites, we love all cameras equally, and we try to maintain good relationships with all the camera companies. We work hard to stay on top of the announcements and whatever they're releasing in terms of technical specifications of new cameras. Part of the reason why we supported LogC4 ARRI Wide Gamut 4 right upon its launch was that we attended Harald Brendel's presentation at HPA 2022. He was the very last speaker and when we got the specifications, Jeffrey implemented them in software and away we went.

Do they usually call you or does it just happen by accident if you are at a lecture?

Greg: I like to think that we are always ahead of the game, but sometimes they'll release a new firmware that unlocks a new feature. A customer or beta tester might tell that camera's team, or our team, "Hey, I can't do this thing. Are you able to support it?"

ARRI LogC4 is a good example. How could you implement it so quickly?

Blake: We've spent the last 10 years developing our color pipeline and video processing architecture. It's actually very flexible and versatile. As Greg said, at the end of the day, it was just a mathematical transform. They may have worked on it for three years to refine the transform and then they give us the final version. From there it's pretty straightforward. This one was actually better than a lot of the other ones from an implementation perspective.

I guess the same thing is true with EL Zone. You already had false color.

Blake: Exactly. We already had a tremendous number of the building blocks. So it was really just a question of collaborating with Ed Lachman, ASC to get that put together.

Greg: Blake, can you talk about the architecture of how we devote resources to making such a rich user experience from a software capability on our hardware?

Blake: Whether it's a rocket ship or a car or a monitor, there are a lot of fundamental building blocks. A lot of cars on the road have the same drivetrain with a different body, or the same body with different engines. As Greg said, we spent a great deal of time building a software infrastructure and an FPGA infrastructure to be able to move and add things very quickly. We already had false color, exposure, focus and all these other basic tools. Being able to bring in EL Zone was pretty quick. A lot of what we had been doing previously was SDR. And then we've been moving with the new 4K monitors with this push towards HDR. So again, we had a lot of the fundamental building blocks. All these things really get us to where we can create reliable and repeatable color-accurate monitors.

Greg: A lot more goes into color science than just the display itself. There's the processing and the handling of data in and data out. The FPGA and software cross over in different aspects. The way that we apply transforms is done in software, but the way that the application of it is processed is done in the FPGA, in and out. I'm sure it's the same for a camera, now that I think about it, where there are the visual teams and then the processing teams. Obviously they're both doing a lot of math, but one might be more focused on how it looks perceptually, and one might be focused on taking a super sampling of RAW 16-bit data and applying magic. That's the real genius "human computing" element.

Blake: As an engineer, I want to make it measurable and I want to have the hardcore science. What was an education to me in this business is you can do all the serious mathematics you want, but at the end of the day you need people who know what they're looking at on monitors side-by-side. I believe in all the science, but what we're really doing is helping artists do their job. There's art at the end of all this science. To see the art at the end is always really fun.

Cine 7 HD LCD, 1920 x 1200 touchscreen 1800 nits

SmallHD OLED 27 4K HDR 550 nits

Tell me a bit about the panels in your monitors.

Greg: A monitor panel is as complicated to fabricate as a camera sensor, maybe more. Our Vision 24 monitor, for example, has 4,096 by 2160 resolution, and each pixel of resolution has an RGB liquid crystal diode. This incredibly complex system is made in a billion dollar factory, a fab just like Intel or AMD might use. But this piece of glass does not emit any light. It's just a filter—similar to a bunch of irises in a lens. Light comes from behind and transmits through it, and it takes quite a lot of light to punch through. In fact, only around 3% to 5% gets through.

Wth this extremely limited transmissivity, you need to add a light to the back. That is essentially what a panel is: a piece of LCD glass with a light behind it. Now, there are all kinds of lighting systems that push light through these filters. And there are different elements that filter that light, whether it's to make the color uniform, to polarize it so that the photons are going straight through to eliminate crosstalk, refraction or reflection, and to have uniformity. And then there's something called quantum dot technology— nanoparticles that, when they're excited by light, change the color of light. The stack that comprises the "panel" is where we come in, where we specify the end result.

Blake: Quantum dots absorb blue light (high energy) and, depending upon their size, emit either green or red light, which is lower energy. So with a quantum-dot product, whether it's a TV or our panels, you put blue light in and you get red, green and blue light out.

The inside of some of these panels look almost like a LitePanels lighting fixture's LED array.

Greg: When you hear people refer to an "LCD monitor," usually they're describing the characteristics of an edge-lit LCD or a backlit LCD where the light is uniformly bright across the entire LCD glass.

A lot of our more affordable panels are edge-lit, but with our Vision series we sought to overcome the issue of poor LCD contrast. The problem with a direct-drive or edge-lit backlight is that it just cannot achieve HDR contrast—which means rich black levels. I mean, cinematographers have no time for something that isn't perfect.

Our full-array local-dimming (FALD) Vision Series has thousands of LED zones that are controlled in dual-modulation alongside the LCD array. Instead of having one big backlight, we have thousands of backlights. Each one of those zones is able to dim dynamically. We spent years developing our own proprietary FALD algorithm that allows us to render the best contrast for every area of the image.

Blake: When you have black in an area, we're actually turning the light off. All we're doing is trying to hide it from you. But here we're actually able to turn the light off in local areas, local dimming. That really gives you the brightness of an edge-lit LCD, because we've got the LEDs on, but it also gives you darkness approaching the level of an OLED. The benefit of OLED is you're actually turning off the individual pixels.

Greg: One last thing about other alternatives: OLED is a different from LCD—it is a different type of display technology. LCD is transmissive. Light goes through it. It affects the light either by letting it through or blocking it. OLED has no backlight; it is emissive itself. A pixel is on or a pixel is off—each pixel is its own little light. When it's off, it's off. In theory, OLED is the optimal technology in our world. However, they're incredibly expensive to make, they're mostly not made in the sizes that we need for film production, and they don't get bright enough to display 1000nit HDR.

Blake: The container that studios are delivering in has a range of 1000nits. So, if there's a scene with bright specular highlights, the sun or fireworks, those highlights can go up to 1000nits without being clipped.

Greg: We make OLED displays because they often have more success at rendering these dark, dark areas. That's less of a challenge because of the nature of their technology. We've had to work incredibly hard to accomplish something close to an OLED with the Vision series FALD (full-array local dimming) monitors. We make OLEDs because people still love them. However, they only go about halfway to 1000nits. If you desire the ability to actually see what a 1000nit scene looks like, you need to use an HDR monitor. That is why we had to do this, because we needed to be able to be bright and dark at the same time.

Mike Claes, Director of Color Science and Analytics at Small HD.

Greg Smokler at a SmallHD whiteboard.

Mike Claes is Director of Color Science and Analytics at Small HD. He grew up on Long Island, developed an early interest in astrophotography, attended NC State in Raleigh, majored in software development and engineering, and got into professional portrait photography after college. He worked for more than 20 years as a software engineer at Cisco Systems before joining SmallHD.

Jon: Where did you learn color science?

Mike Claes: Through my own study and research. It was all about light. I had to get the light perfect. Color science mainly has to do with how humans are going to perceive colors. And how I can make a product that is going to allow a human to perceive a color in the most accurate way possible.

Do you think DPs see colors differently than humans?

Mike: I think so. Yes.

I do, too. I drive my family nuts when I see the flickering of an LED light or its greenish hue—and they do not.

Mike: I stood next to some of the best eyes in the world. And my first glance might have been that the image looked perfect on the monitor, but no, they saw it differently.

What causes that?

Mike: Personal training, attention to detail, and getting to the point where you know what to look for.

How do you train?

Mike: You just have to look at a lot of content.

It's almost like "le nez," the nose, the person who specifies the scents of perfumes. The training takes years of practice with different selections and mixtures.

Mike: You also have to keep in mind that different people are going to perceive colors differently. You almost need your own personal calibration because, even as you age, your own eyes change. Studies have shown that young women tend to perceive more colors than men. There are a number of different reasons why a color will be perceived differently by different people.

For example, let's just talk about an RGB display. You have red, green, and blue LEDs. Now, red plus green plus blue is going to be white. But the question is, what's the spectrum? What's the spectral power of each of those LEDs that make up the white color? And then you have an OLED quantum-dot display, which is basically nano-structure, whose size dictates what color it's going to produce when excited by an alternate wavelength.

The typical structure of a quantum-dot display emits a very low-wavelength blue light. That is going to excite the red and green quantum dots to make a full white color. The spectral power of those colors is going to be very different from a regular OLED or a regular LCD display. It's that spectral power difference that causes people to perceive the color differently. So a probe may read it and say that's exactly D65, but you may look at it and say it doesn't look right to you.

If different people see colors in different ways, who's the ultimate arbiter here at SmallHD of how that color should appear?

Mike: We have several people. It's a group of color scientists, photographers, and cinematographers—all guided by Tristimulus probes and Spectroradiometers. Also—Scott, Joel, John, Greg and Dave are our human probes.

How do you compensate for different camera manufacturers, with different cameras having different color science?

Mike: We will calibrate our display to what we believe is the target color gamut. And then the artistic intent of each camera manufacturer is very important.

Greg: The color science of a camera is, for example, to say there are photons reflecting off of a person's face and that camera's digital sensor is excited in a certain way by those photons. It's sampling the voltage—each value of each pixel—and converting it to a digital value. Then it throws away some of that data per frame so it can be contained and recorded. On the simplest level, a sensor is like a solar panel. You point light at it and it turns into electricity.

A camera sensor has a mosaic of red, green, and blue filters in front of this sensor. It's like having three buckets to catch electric current. The green bucket gets this much, the red one gets that much, and the green that much. The magic is how they're going to encode photons of the natural world.

And so, color scientists are also judging what they're doing by looking at it on a monitor. You might ask, what is red? We measure red by these means of perceptual and photometric electronic sensors. It's a slippery slope if you again start to think about the differences in every human's perception and even the most expensive display technology's lack of "perfection." In the end, it's our color scientists' goal to display colors and skin tones consistently and as objectively as possible.

You don't try to over-correct or under-correct?

Greg: We want to be absolutely neutral. You have 10 bits to paint with. You have 1024 reds, greens and blues. You can mix them up however you want. Our goal is that when the video source says it's 936 blue that you get 936 blue code value.

And what is the effective dynamic range of an OLED display?

Greg: Technically it's infinite. We say that it is infinite because if black is zero, you can't multiply zero times anything. But the HDR specification requires black to be displayed as 0.005 nits.

Mike: When you think about what a human can even see, you're down to about 0.003 nits. Humans don't really perceive color all that well at that level. We can perceive black and white contrast.

Greg: Striped tiger in the grass. Pointy stick. Those are the things that we evolved to see.

Mike: Once you get to the point where you transition into the range where you can actually start to perceive color, then the color accuracy starts to become important.

And yet, probes are integrated in your new PageOS software.

Greg: We have almost finished an integration with Calman from Portrait Displays. It gets readings from a probe and creates a calibration lookup table that makes the display calibrated as ideally as possible, automatically.

You must hate going on airplanes where every monitor looks different. Do you try for a similar look across your entire range of products, even though they have different technologies?

Mike: Imagine a moving ball and you don't want the color of that ball to ever change. That's what we're striving to achieve—perfection. The color of that ball should be constant whether in bright light or in dark shadows. It's a challenge because you have to consider when humans actually perceive these things. And what's your room brightness? It's a combination of all those factors.

Greg: SDR and HDR standards include specifications for room brightness. Originally it was intended for projection, to understand the contrast ratio and how bright a projector should be before your theater viewing experience is ruined by exit signs and aisle lights.

Mike: It's important to consider inside a DIT tent or in a grading suite, when you're working with a computer monitor as well as a display monitor. How bright is your computer monitor? How bright is your ambient room lighting or light coming from outside the video village tent? All these things start to become important.

Do SmallHD customers ask more for HDR or SDR?

Greg: People are still using SDR a lot. But they're buying our monitors because they're HDR-ready. People will buy a 540 nit OLED with the idea that they can do 16 of the 17 stops of a 1000 nit PQ if they need it. You could also monitor SDR inside of PQ. It's a choice, a technical setup.

But almost everything is finished in HDR these days. They then do an SDR pass or a Dolby Vision conversion to SDR. It is extremely rare to find anyone who is finishing only in SDR because all of the streaming platforms are HDR.

Producers may think that multiple HDR monitors on set are too expensive. Are you democratizing HDR monitoring?

Greg: I think the main reason is not because they don't like HDR, but because there hasn't been a practical monitor technology that lets them do it. Until now. We're shipping true HDR monitors and almost-fully-HDR OLEDs that are light enough and rugged enough for use on set.

We have an amazing software tool set to operate monitors quickly and accurately. We're seeing some of the most highly-decorated cinematographers in the world—and their DITs—using our monitors, and providing great feedback, which energizes us to continue building on our goal to make the best monitors in the world.

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smallhd.com
creativesolutions.io
videndum.com

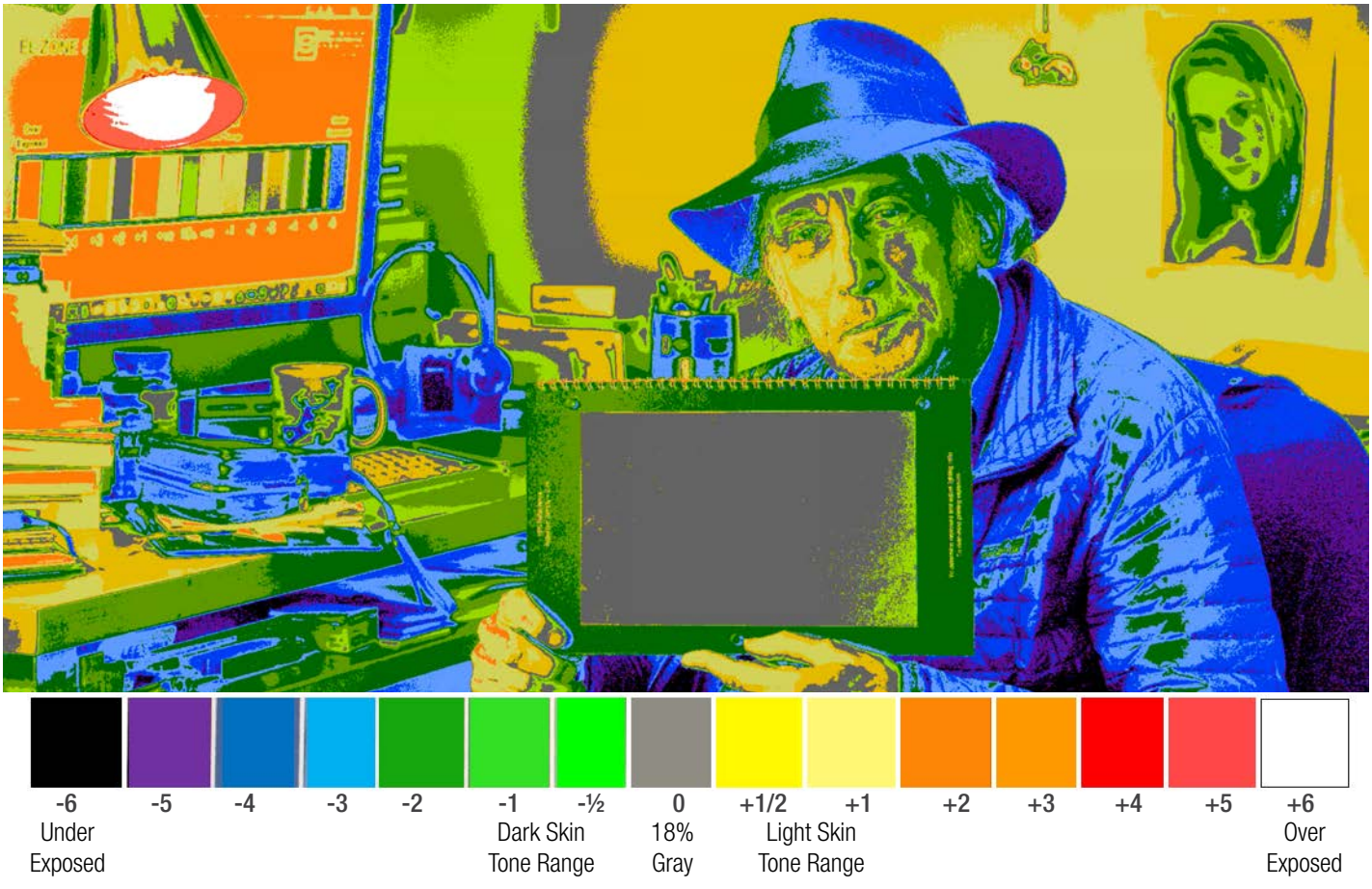
EL Zone on SmallHD Cine 24 Monitor

SmallHD Cine 24 connected to an ALEXA 35.

EL Zone has been added to PageOS 5 on all current SmallHD monitors. It is also available as a free software update if you're using an earlier version. EL Zone was conceived by Ed Lachman, ASC and developed for SmallHD monitors by Creative Solutions.

Note that Ed's original reference chart, as seen on his monitor, *below*, had the over-exposed colors on the left. The reference chart is now updated to a more intuitive left-to-right scale that's easy to remember:
Cool = under-exposed on the left.
Warmer = over-exposed, hot, on the right.

EL Zone is like a spotmeter in your monitor. Each stop of exposure is represented by a color. Areas of the scene over-exposed by 6 or more stops are shown in white. 18% gray is normal-neutral. Black is under-exposed by 6 or more stops.



How to use EL Zone in SmallHD PageOS 5

Above: EL Zone being tested at SmallHD in Cary, NC. RED V-RAPTOR's SDI output is connected to a SmallHD Cine 13 with EL Zone enabled.

At right: Cine 13 Color Pipe setup menu.

EL Zone is as intuitive as a rainbow. It lets you easily see exposure zones on a monitor without having to translate IRE values into useful T-stops. The reference chart that correlates colors to T-stops can be repositioned on-screen.

Setting up EL Zone on a SmallHD Monitor

We need to start by creating a color pipe.

- Go to: SETTINGS > COLOR PIPE.

The Color Pipe should match the camera's Log setting.

Here are suggestions for the RED V-RAPTOR:

Settings> Color Pipe > NEW

- Input Type=LOG
- Camera=RED (options)
- Color Space=RWG RGB
- Curve=RED Log3G10
- Range=SDI Full Display=Do Not Convert
- Assign Color Pipe to Input you are using

Then you can activate the Exposure Tool and use EL Zone — described next.

SmallHD Cine 7 Pages for EL Zone Exposure, Look and Log

SmallHD Cine 7 with EL Zone active. Exposure is set for camera right side of face (18% gray).

View the scene with LUT applied by swiping left or right to a different page.

Log view displayed by swiping to a different page.

EL Zone is intended to be used with a Log signal. It will still work with a LUT applied to the video, but may not be accurate.

Currently, there are RED, ARRI, Sony, Panasonic and Canon profiles.

Let's connect a Sony camera to a SmallHD Cine 7 Monitor.

Activating EL Zone on a SmallHD Monitor:

As described on the previous page, the Color Pipe should match the camera's Log setting.

In the example at top left, we are in Sony S-LOG3.

Let's assign EL Zone to the EXPOSE Page on the SmallHD Cine 7 Monitor:

1. ADD NEW TOOL
2. Choose the EXPOSE Page.
3. Select EXPOSURE ASSIST and ADD TO THIS PAGE.
4. ENABLE.
5. Select STYLE > EL ZONE
6. GUIDE LOCATION lets you position the EL Zone reference chart on screen.

PageOS 5 and EL Zone become indispensable when you slide back and forth between pages.

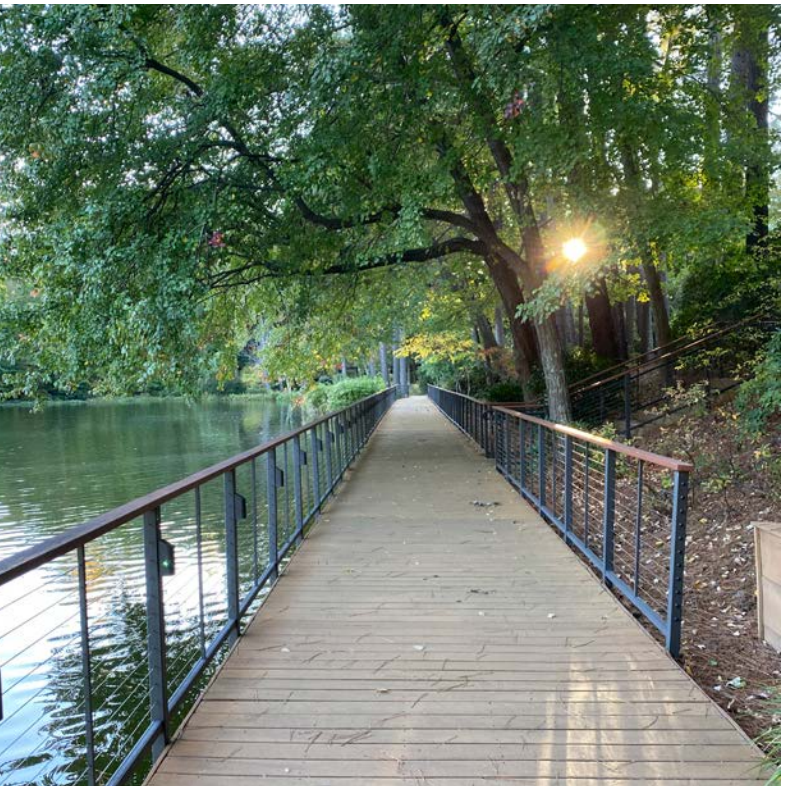
With a swipe of your fingers on the Small-HD touchscreen, you can quickly view:

- exposure with EL Zone,
- the LUT-applied look,
- the Log image.

Larger SmallHD monitors haver navigation /keyboard keys.

By swiping or navigating between screens, you're looking at the LUT applied by SmallHD monitor tools, not applied to the camera's monitor output.

Where to Stay near SmallHD –Umstead



A copywriter surely wrote this and it is true:

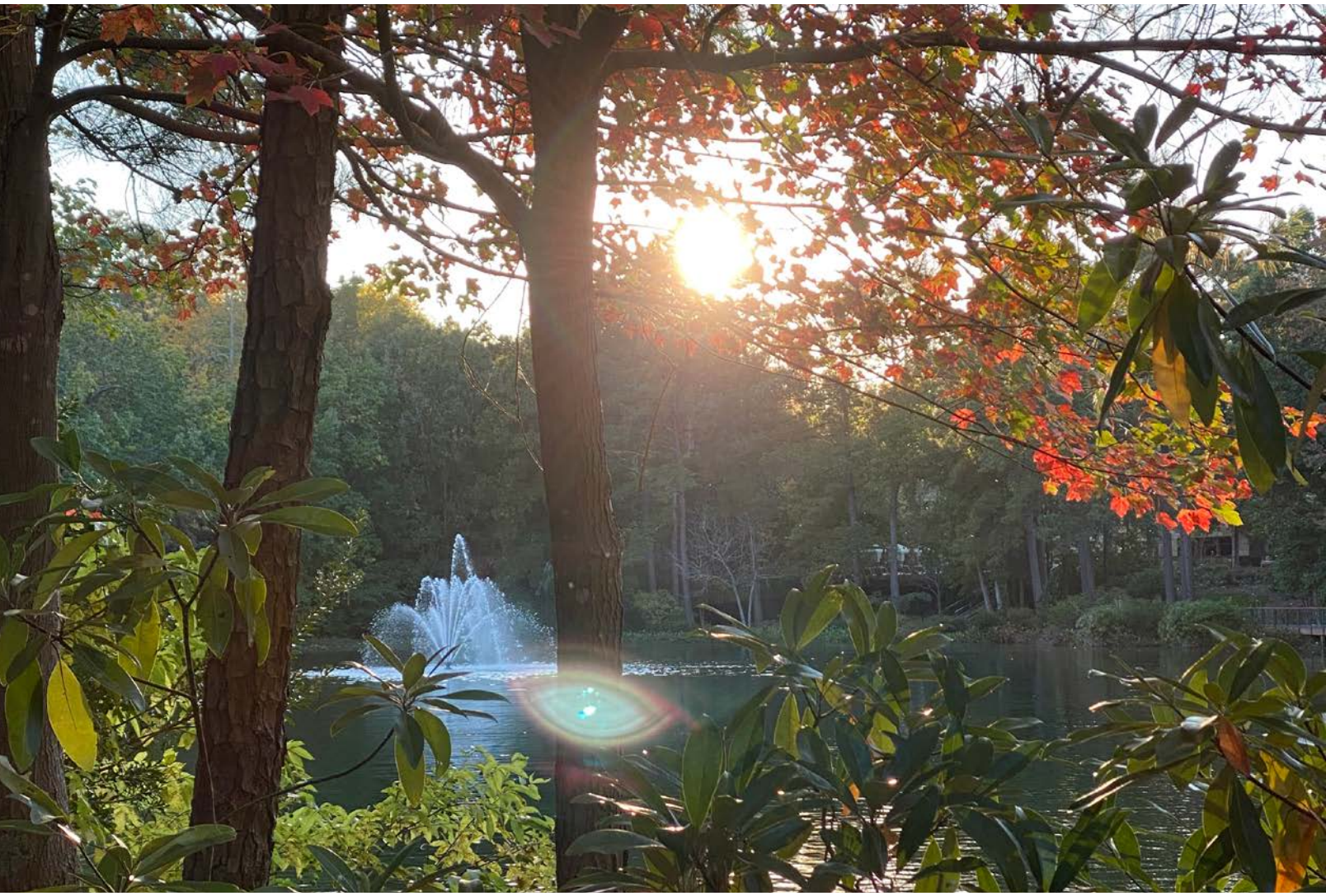
"Tucked among whispering Carolina pines on 12 acres of lake-front landscape in Cary, North Carolina, The Umstead Hotel and Spa is a singular, sophisticated triumph in North Carolina's Triangle region. Be welcomed into the only Forbes Five-Star Hotel in North Carolina and experience breathtaking views, stunning, art-filled interiors and exquisite dining in a setting where art, nature and wellness beautifully come together."

FDTimes wrote this:

Fifteen minutes from SmallHD, the Umstead Hotel and Spa reminds you of a hotel in Kyoto on the Kamo River. It is just as serene, adjacent to a beautiful pond with an encircling nature trail. Raleigh, Durham and Chapel Hill are a few minutes away.

Across the road, William B. Umstead State Park covers 5,599 acres. With 34 miles of hiking and 13 miles of bike trails, there are three man-made lakes and tributaries with boat rentals and paddling.

Of course, you won't have much time for any of this because dinner awaits at Heron's, one of only 67 Forbes Five-Star restaurants in the world. FDTimes Restaurant Rule #3 is avoid eating in the hotel. But here, at Heron's, it is worth the trip down the staircase or elevator of the Umstead Hotel.
theumstead.com



Where to Dine near SmallHD – Herons

Executive Chef Steven Devereaux Greene (*above*) is a James Beard Award Semifinalist. Forbes restaurant critic John Mariani wrote, "Herons matches everything else of quality at the Umstead but stands as a culinary beacon in the entire region, a restaurant of great generosity and elegant proof of fine dining's enduring pleasures." Floor-to-ceiling windows offer views of the surrounding gardens and grounds when you're not peering into the open kitchen where Chef de Cuisine Spencer Thomson, who staged at 3-star Michelin Guy Savoy in Paris, is working.

The Umstead owns nearby One Oak Farm, where farm to table fresh produce is assured.

Start with crab (with nashi pear, purple cauliflower, sea urchin, chawanmushi). Tim had oyster (poached, Charleston gold rice stew, champagne sabayon in a sea of dry ice that enveloped the table.) Greg had hamachi (broccoli, kohlrabi, sea beans, ice lettuce, ginger-tamari).

Next, have the lobster (with leek terrine, pomelo, avocado, puffed amaranth, fennel) or scallop (turnip, nasturtium, meyer lemon, dill, horseradish broth).

For main course, the duck (dry aged, black tea consommé, fermented gooseberry, cardamom) or monkfish (black truffle enrobed, sunchokes, white acre peas, bacon, velouté).

Save room for desert: citrus, coconut, pear, chocolate or sformato.

And a wine pairing so thorough you may not remember how you ever got to the airport or on the plane the following morning: Chateau Carbonnieux 2017, Morandina Valpolicella 2018, Cartology Chenin Blanc 2019, Desiderio 2018 and Chateau Dosiy-Védrines 2013 Sauternes.

SIGMA fp L and fp: first mirrorless cameras with EL Zone

EL Zone

SIGMA fp L and fp are the first mirrorless cameras to get EL Zone. With new firmware updates, your SIGMA fp L (61 MP) or SIGMA fp (24.6 MP) camera is now a spotmeter and exposure tool, in addition to being a versatile DP/Director's Finder, smallest Full Frame cine camera and mirrorless still camera.

To activate EL Zone for the SIGMA fp L and fp, select: MENU > SHOOT (Page 5) > False Color > Style > EL ZONE.

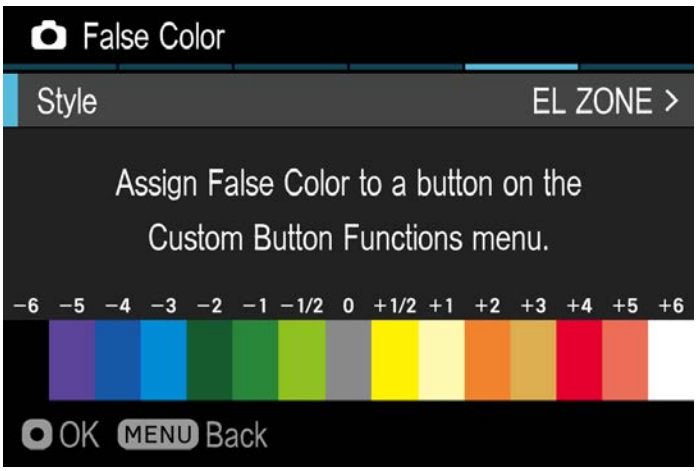
The menu (*below left*) shows how easy it is to see exposure values in actual, logical T-stops with EL Zone, compared to traditional "False Color" IRE values (*lower right*).

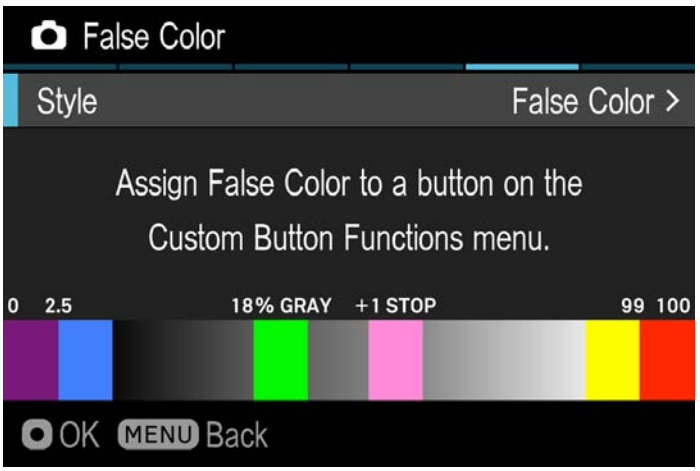
Of course, EL Zone lets you put exposure where you want it. Gordon Willis, ASC, would not have exposed Marlon Brando's *Godfather* under-exposed face at default Kodak 18% gray.

Takuma Wakamatsu, SIGMA Product Manager, said, "EL ZONE is based on an evaluation of the actual recorded signal. It displays the exposure status of any part of the frame in a color-coded manner, allowing you to evaluate highlights, shadows, see where details may be lost and where to set your lens aperture."

EL Zone developer Ed Lachman, ASC said, "I found false color and waveform monitors much too general. They are based on IRE values that originally measured analog composite video signals as percentages of voltage, aren't consistent with T-stop values on lenses or light meters, and are not the same from one manufacturer to another.

"I'm happy that SIGMA fp L and fp are the first mirrorless cameras to incorporate EL Zone."





SIGMA fp L and fp EL Zone

EL Zone for SIGMA fp series cameras works with CINE RAW (CinemaDNG) or H.264 MOV or STILLS (DNG or JPEG). The values and accuracy are consistent. SIGMA suggests that RAW is the best for the fp series as it doesn't have a LOG function. For external monitoring, SIGMA suggests the camera color MODE to be turned "OFF" for monitoring on an external display.

CinemaDNG UHD 8-bit (internal recording, 12-bit external)

MOV UHD All-I (internal recording)

DNG 14-bit Still

JPEG Fine Still

Firmware Updates for SIGMA fp L and fp

SIGMA fp L camera firmware update Version 3.00 and SIGMA fp camera firmware update Version 5.00 provide major additions:

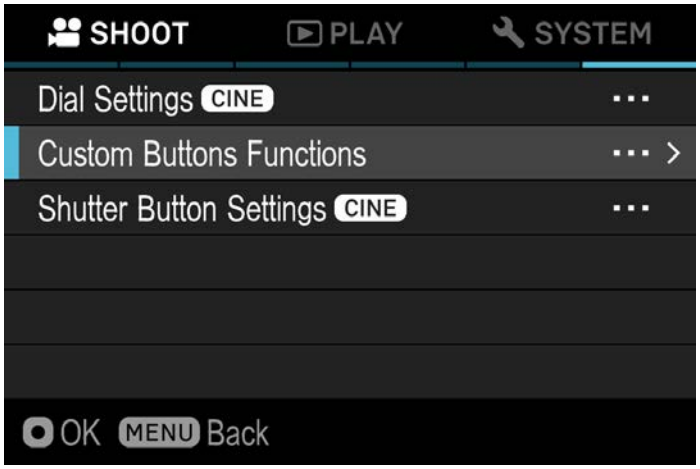
- As discussed on the previous page, EL ZONE has been added to the camera's False Color menu and function. It displays the exposure status of any part of the frame in a color-coded manner, covering up to 6 stops of under-exposure, 18% gray, and up to 6 stops of over-exposure. It is like a spotmeter in your viewfinder or monitor, calibrated in accurate T-stops.
- WARM GOLD is a new color mode for the camera. It creates a mellow atmosphere with subdued tones and warm colors.
- FOCUS FRAME ONLY has been added to the information display menu in the (Display) mode setting. MENU > SYSTEM (Page 2) > |□| (Display) Mode Settings. This is only available in STILL mode or when CINE mode is set to STILL-like.
- To set CINE mode to STILL-like: MENU > SYSTEM (Page 2) > STILL / CINE Link Settings > Shooting Style > STILL-like. Among other things, Still-like shows shutter speed as a fraction, even if you are in CINE mode; CINE style displays shutter angle, timecode, etc. I would suggest staying in CINE style.
- The camera can now be switched off even during long exposures.
- The camera is now compatible with a 4TB external SSD.
- Open Gate Anamorphic De-squeeze Viewing (1.25x, 1.3x, 1.5x, 1.65x, 1.8x, 2x) for ARRI ALEXA LF / ALEXA Mini LF is now available in Director's Finder mode. MENU > SHOOT (Page 5) > Director's Viewfinder (CINE) > Brand: ARRI > Model: ALEXA LF / ALEXA Mini LF > Settings: Open Gate > select de-squeeze factor.)
- Atomos Cloud will be supported upon updating firmware of Atomos devices and announcement from Atomos about compatible devices and the release date of the firmware.

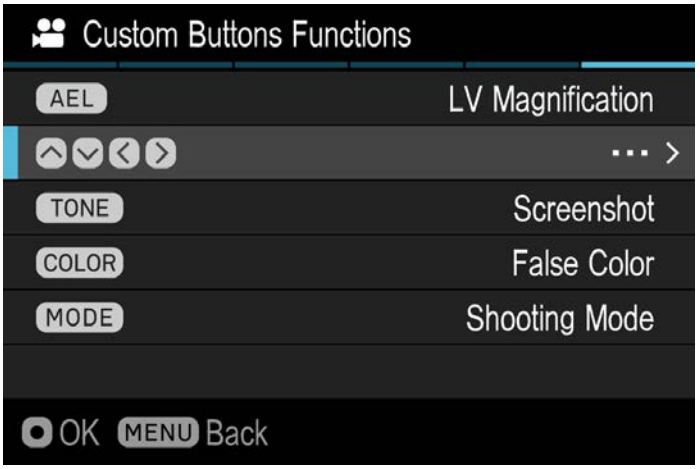
To update the SIGMA fp L and fp camera firmware, go to:

SIGMA fp L Ver. 3.00
sigma-global.com/en/cameras/fpl/?tab=support&local=firmware

SIGMA fp Ver. 5.00
sigma-global.com/en/cameras/fp/?tab=support&local=firmware

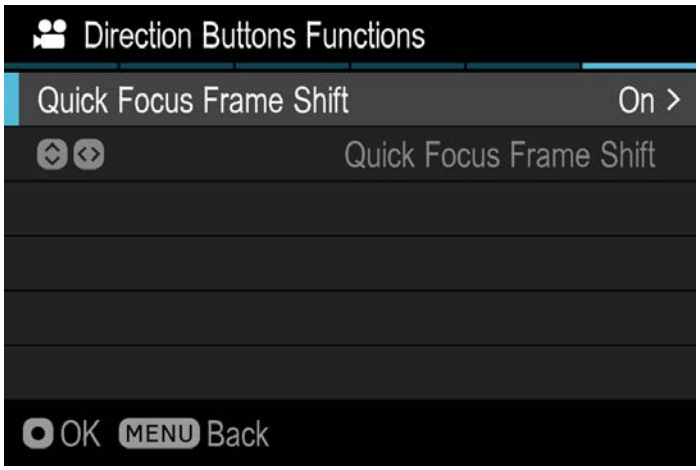
Suggested SIGMA fp L Settings



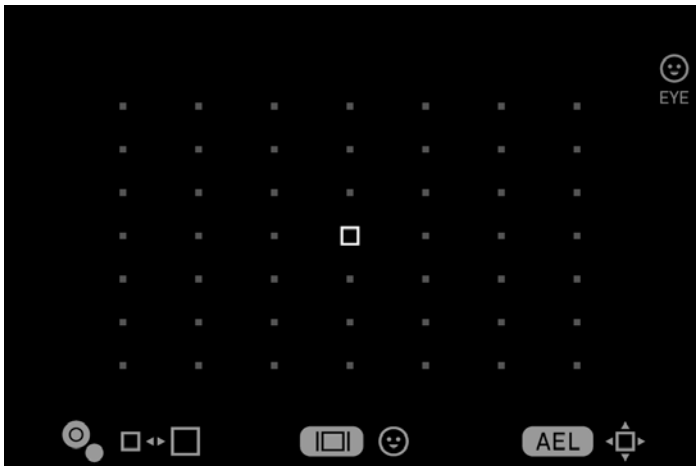


I like to assign fp L buttons as follows. MENU > SHOOT Page 6 > Customs Buttons Settings:

- Assign AEL button to LV Magnification to enlarge viewfinder image for manual focus checking.
- Assign 4-way rear dial's direction buttons to move the auto-focus spot position (called Quick Focus Frame Shift).
- Assign TONE button to Screenshot and COLOR button to False Color, which we have already set to EL Zone.
- MODE stays in default setting for Manual, Shutter Priority, Aperture Priority, or Program Exposure.



Quick Focus Frame Shift (auto focus "joystick" control) is set.



This is what Quick Focus Frame Shift (spot focus) looks like in viewfinder.

Rear view of SIGMA fp L.

You can set up to 5 frame-lines. 3 of them have totally customizable aspect ratios.

Here, we have set up an extreme example of 5 frame-lines displayed concurrently.

Three are pre-determined: 1.33:1, 1.85:1 and 2.39:1. Two are user-definable, which is super helpful.

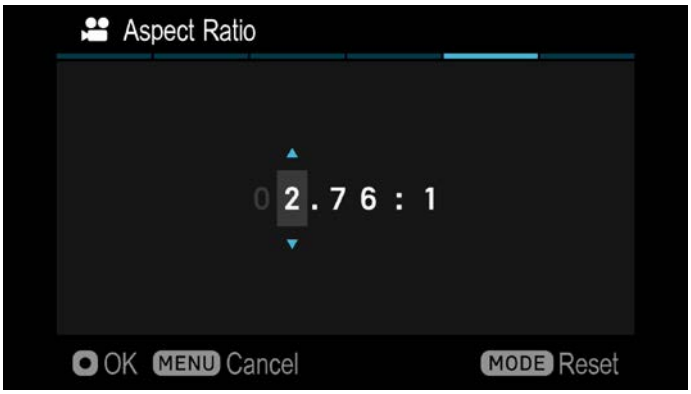
4-way "joystick"

Select (OK) Button:

There's one tricky thing—if you want a Screengrab of your EL Zone display, you have to press the COLOR button, followed by the DISPLAY button and then the Select (OK) Button. Nimble fingers are needed.

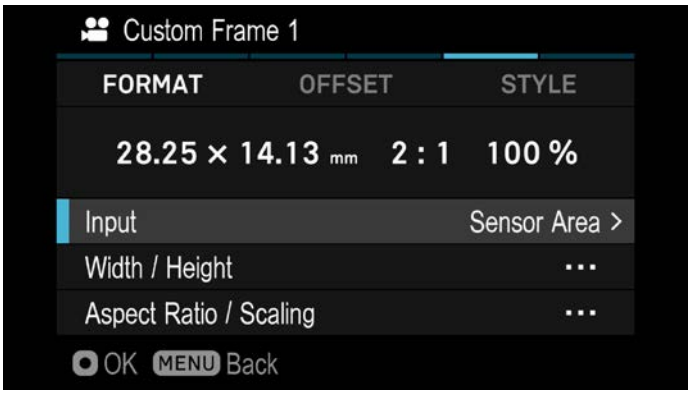
SIGMA fp L: Unlimited Framelines

The SIGMA fp L and fp cameras have user-defined framelines and aspect ratios. The menu screen is intuitive, elegant and simple. Enter any aspect ratio and image size you want. Multiple frame lines, colors, styles and shading abound.

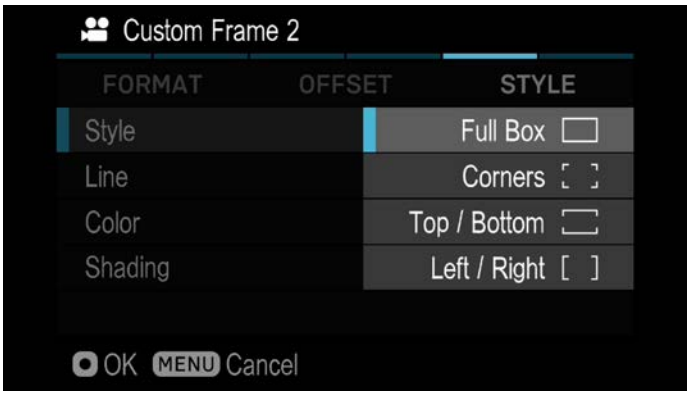


1. Direct numerical entry of any aspect ratio.

It works in familiar film-style ratios of xx.yy : 1
You can also enter the aspect ratio as a whole number head-scratcher such as 22:8 (2.75:1 — almost 2.76:1 Ultra Panavision 70, as in *Ben-Hur* and *The Hateful Eight*.)

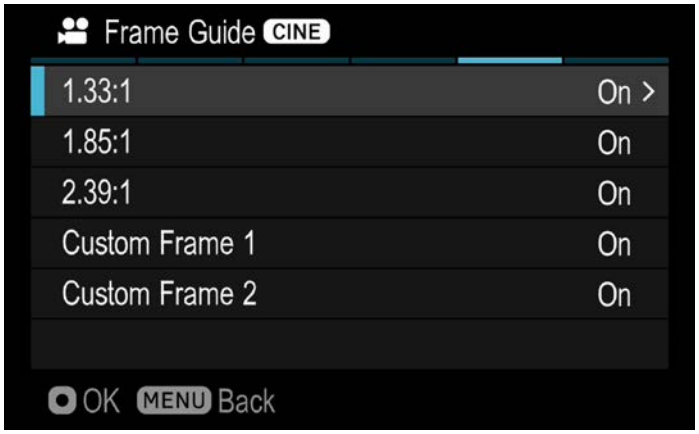


2. Or, enter an aspect ratio as defined by the actual sensor area in mm. In this example, we want to use the fp L finder to scout a scene to be shot with an ALEXA SXT with an aspect ratio of 2:1. We know the ALEXA's sensor is 28.25 mm wide. So the height will be 14.13 mm. Navigate to STYLE for frameline color and width. OFFSET repositions the framelines.



3. The Custom Frame STYLE menu offers choices of:

- Frameline appearance (Full Box, Corners, Top-Bottom, Left-Right)
- Frameline thickness
- Frameline color
- Shading (masks outside picture area)



5. Turn the framelines on and off here. For example, you may want to compose for 2.39:1 for theatrical release and 2:1 for Netflix.

fp L DP/Director's Finder

6. SIGMA fp L and fp are amazing DP/Director's Finders. Paired with the HENRI finder system from Leitz, you get a beautiful birchbark handle, L to LPL mount (optional LPL to PL adapter), carbon fiber rods, a lens support, Arca Swiss baseplate, and start/stop switch.

Geoffrey Haley, SOC flying Steadicam M2 with Volt, Atlas Orion 40mm anamorphic prime, Preston LR2W, Teradek Bolt, Transvideo 8-inch CineMonitorHD.

Geoffrey Haley, SOC on Steadicam VOLT

Steadicam Volt Motor Drive Unit

Steadicam Volt Control Box

Geoffrey Haley sparked interest in last month's FDTimes when he said, "At this point, it's hardly acceptable to show up on a professional film or television set as the Steadicam Operator without either a VOLT or Wave." I wanted to learn more.

Geoff has won SOC Operator of the Year twice. His credits include The Gray Man, Joker, Cherry, Steve Jobs*, four of the* Fast and Furious*, and more. About Steadicam VOLT, Geoff explained:*

I use the VOLT and was actually one of its early adopters. I fly the Steadicam M2, which has an integrated VOLT brain box in the nose of the top stage. I find, at this point, that it's hardly acceptable to show up on a professional film or television set without a VOLT or Wave on your Steadicam. That's because the biggest complaint that directors and DPs have had about the Steadicam over the last four decades is the floating horizon.

That has been the main Achilles heel for Steadicam. And the VOLT answers that issue in such a fantastic way. The Steadicam arm gives you vertical stabilization in a way that no other piece of equipment does. Maybe you have a Black Arm or similar stabilizer, which is essentially like a Steadicam arm for heavier payloads to be used on vehicles with remote heads, etc.

Now, enter the VOLT, which stabilizes that Z-axis, and suddenly you no longer had to worry about horizon. Of course, if you were a horrible operator and you "death grip" the post, overpowering the VOLT motors, you might still have bad horizons. But, if you are an experienced operator, and you've been spending 90% of your mental energy trying to keep those damn horizons level, the VOLT allows you to take that 90% and apply it somewhere else, like shot composition or navigating physical obstacles on a tricky set.

The VOLT actually stabilizes two axes—the horizon and the tilt axis. The only thing it doesn't stabilize is the pan axis, for a good reason I'll explain later. The VOLT has taken away our concern about that last little 3% of horizon variability after we have worked diligently to eliminate the other 97%. It's interesting, there has been this notion over the past 5 decades that, with improved technology, there would eventually be something that would "kill" the Steadicam. Ironically, here's a new piece of tech that actually makes Steadicam more effective and desirable.

Essentially, Steadicam has always been a mechanical, analog piece of equipment. Aside from the monitor, it has very little electronics. Steadicam uses gravity, a frictionless pivot point, and springs. That's how it works, and how it worked for the last 50 years, which is great because it has meant that you did not have to go out every 4 months and chase the next firmware update. Over the last five decades, we've had the ability to use this piece of equipment that doesn't break down easily and uses the laws of physics to perform its magic. Other pieces of equipment would come along, but they never really posed a threat to the Steadicam.

But at some point, the gimbal entered the scene. The MoVi, the Ronin and a whole host of compact 3-axis "mini" heads arrived with rotational stabilization courtesy of electronic gyros. The Steadicam was declared, in some circles, as dead technology. But, that turned out not to be the case because even though you had three-axis stabilization, for weight reasons, that stabilization was provided courtesy of tiny little motors, especially on the early models. Those little motors meant the payload of the camera had to be very low.

And so, if you were a DP and you wanted to use a 10-pound anamorphic lens and an ALEXA 65 camera, or something heavy, you'd have a 40 to 60 pound payload that just wasn't going to work for a gimbal rig. And that proved to be a deal-breaker in the wide adoption of gimbal use for high-end cinema work.

Of course, the other problem was the fact that you still didn't have any vertical stabilization with gimbals as you did with the Steadicam, which meant that, early days, your physical arms were acting like the springs of a Steadicam arm, which, at times, gave gimbal shots a bit of a handheld feel. That was always a big problem with using a gimbal if you were carrying it around. You could always discern a gimbal from a Steadicam, crane or dolly if

there was a lot of foreground in the shot. The closer you got to an object with the lens, the more that object was bouncing around, creating distracting parallax as you were walking around it.

So there was the rub—gimbals afforded us 3-axis rotational stabilization, including a steady horizon, but they didn't offer vertical stabilization and couldn't handle heavy camera payloads. The Steadicam offered vertical stabilization and the ability to fly heavy cameras, but always suffered from that pesky "horizon" sway. Interestingly, neither tool "killed" the other—their technologies actually merged. The VOLT (and the Wave before it), owes its lineage to electronic gyro technology developed originally for stabilized remote head gimbals to offer the ultimate coalescence of vertical stabilization, heavy payload, AND 2-axis rotational stabilization.

That is why it's no longer okay for you to show up with a Steadicam that doesn't have horizon stabilization. It's not acceptable anymore because people know that perfect horizon is indeed a possibility now in a Steadicam shot.

People have routinely asked me if I like the VOLT. It's not a question of whether I like it or not, there is just no reason NOT to have it.

There's a notion among some Steadicam operators that it's a badge of honor not to use a VOLT—that the VOLT takes away from the lovely organic nature of Steadicam and that some operators are SO good that their horizons are already perfect.

It's sort of like saying that my penmanship is so good that you won't be able to tell the difference between it and a typewriter. It's just not realistic, and operators who hold that opinion do so at their own peril because, finally, the biggest historical complaint about Steadicam is resolved. And those operators who don't embrace the stabilization of horizon level will likely lose work to those who do.

I mentioned small motors in gimbals. You may be wondering how the VOLT is able to handle a heavier camera while still employing relatively small motors to stabilize the 2 axes.

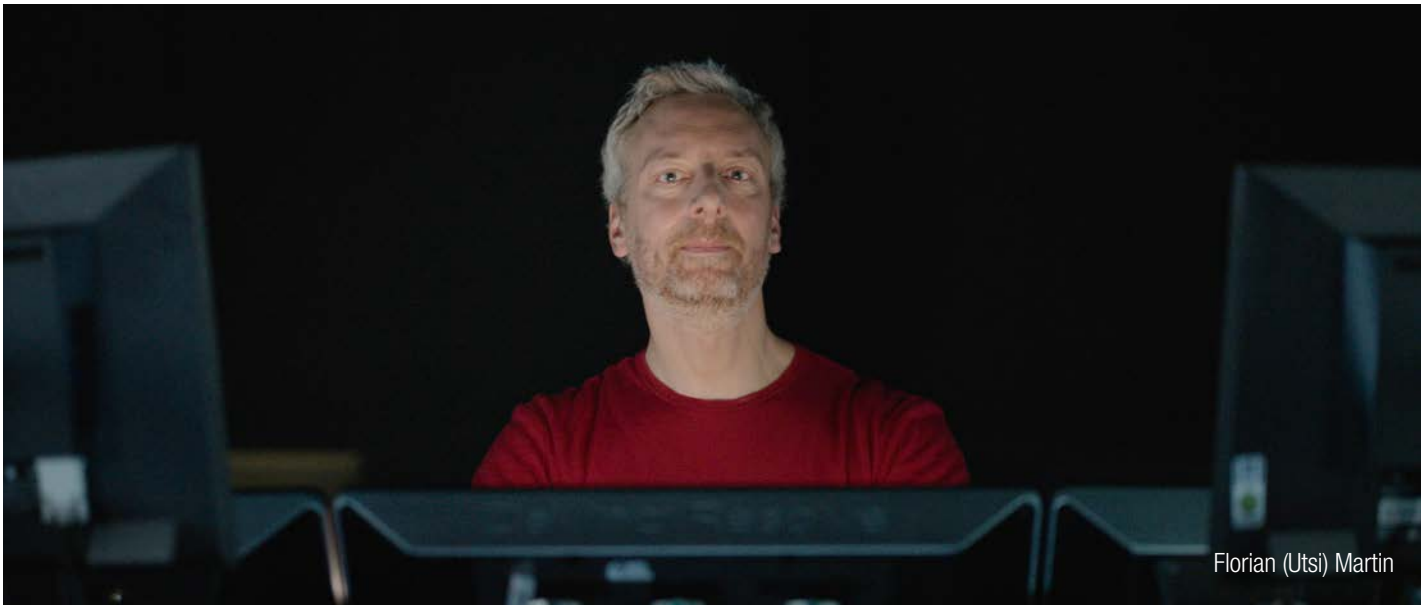
Steadicams have, from early on, been designed to handle heavy payloads, yet the success rate of the VOLT is very much proportional to the proficiency with which you're able to balance the rig—because you want the rig to be 100% neutral. For Steadicam operators, that's strange because normally you're looking for gravity to pendulum the sled slowly down to be perfectly vertical. Now you need to allow the sled to be completely neutral so the relatively weak motors in the VOLT aren't having to fight against undesired g-forces when you accelerate through space during your shot. If you are balanced perfectly neutrally, even a heavy camera will not overpower the VOLT motors and, as for weight, you are really only limited by how much of a load your Steadicam (and lower back) can handle. You're not using your balance to keep the physics from affecting your body, and from affecting the camera.

Steadicam is all about the less you do, the better it will behave. So, in this case, where it's completely neutrally balanced and you are already trained to pan and tilt with a light touch, you don't need that much motor torque to keep it in line. This is true as long as there aren't extraordinary physical forces acting against those motors, like a heavy operating hand or other bad techniques of inexperienced Steadicam operators.

In the final analysis, one of the greatest things about Steadicam is that it's difficult to do well. There is a very steep learning curve. Good Steadicam operators hone their craft over decades and, consequently, get paid very well in return. The sense of accomplishment and satisfaction after performing a (near) perfectly-executed shot is unlike anything else I have experienced in my career.

The VOLT is a fantastic tool, but it does NOT eliminate the need to refine your Steadicam technique or practice your craft until the day you retire. It HAS allowed me to spend less effort concentrating on maintaining a perfect horizon, which I have spent many sleepless nights obsessing over in years past. So, for that reason alone, I'll be forever grateful that my life has become just a little bit easier.

Utsi Martin on Grading ALEXA 35 in DaVinci Resolve



You're a DP. It is your first day shooting with an ARRI ALEXA 35. They called wrap. The next shot is in a glass (of wine). But first, you want to send some framegrabs with suggestions to the dailies colorist. You are staring at a New Project screen on DaVinci Resolve. So many settings. Who are you going to call?

Florian (Utsi) Martin, ARRI Senior Colorist and rockstar to cinematographers worldwide, graciously guided this DaVinci for DPs tutorial. If any details were lost in Zoom, those errors are mine. There are many ways to work with ALEXA 35 and even more ways to configure DaVinci Resolve. Here are some of Utsi's recommendations.

1. You have created a new project in DaVinci Resolve.

2. *(See image below)* Go to Project Settings > Color Management > Timeline color space. Choose **ARRI LogC4**.

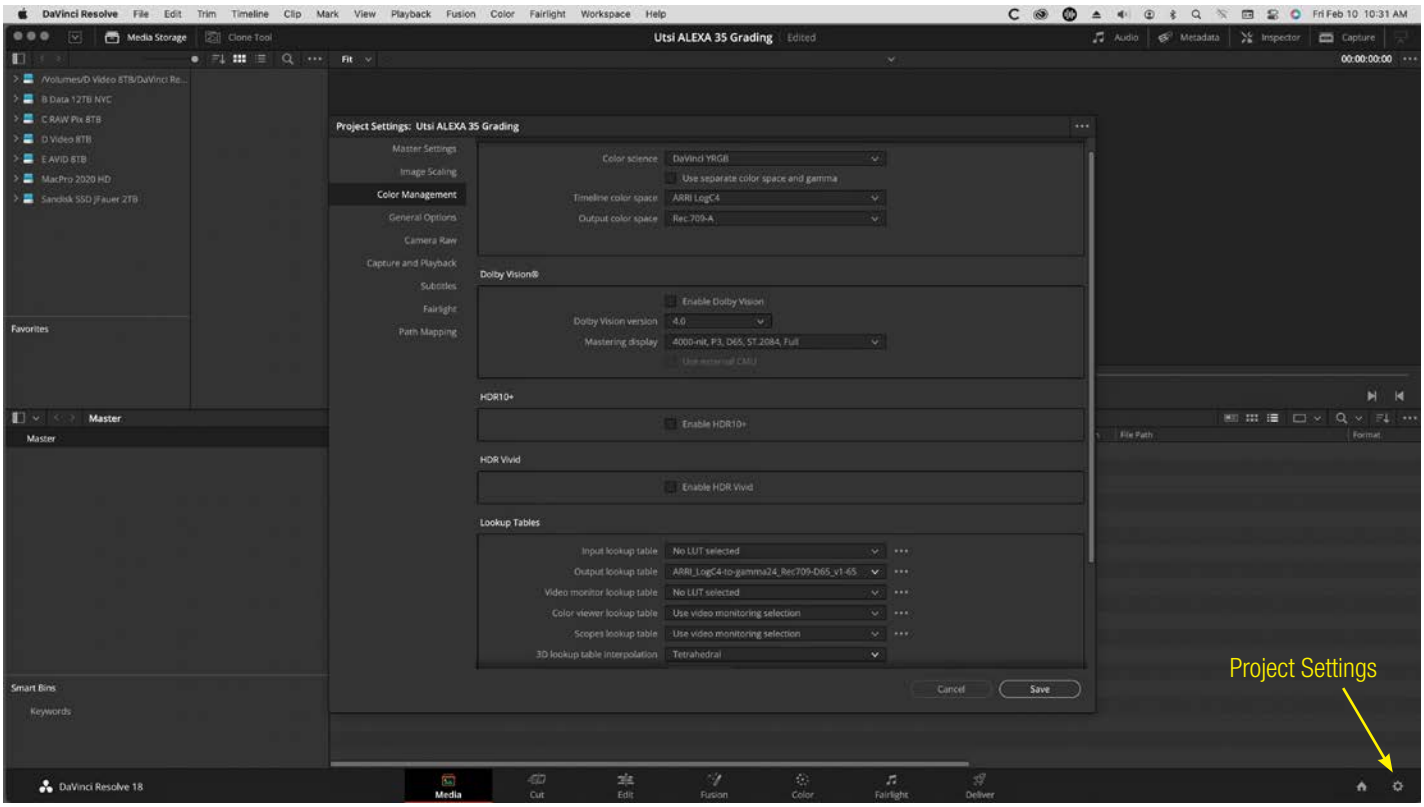
3. Go to Output color space. Select **Rec.709-A**, which is stands for Rec.709 Apple. This is only to get the correct image on your viewing monitor or laptop screen. This will not affect your HD-SDI output to a calibrated monitor in any way.

4. Go to Lookup Tables > Output lookup table > and select ARRI **LogC4 to gamma24_Rec709-D65_v1-65**.

Note: this LUT doesn't come with DaVinci Resolve. You can download it, as well as an entire ARRI LogC4 LUT Package, from the ARRI Technical Downloads page—to be added to DaVinci Resolve's LUT folder: *fdtimes.us/arri-logc4-luts*

5. Select 3D lookup table interpolation > **Tetrahedral**.

6. Click Save.



Utsi on DaVinci for DPs with ALEXA 35

Let's assume you are working on a Mac laptop or desktop.

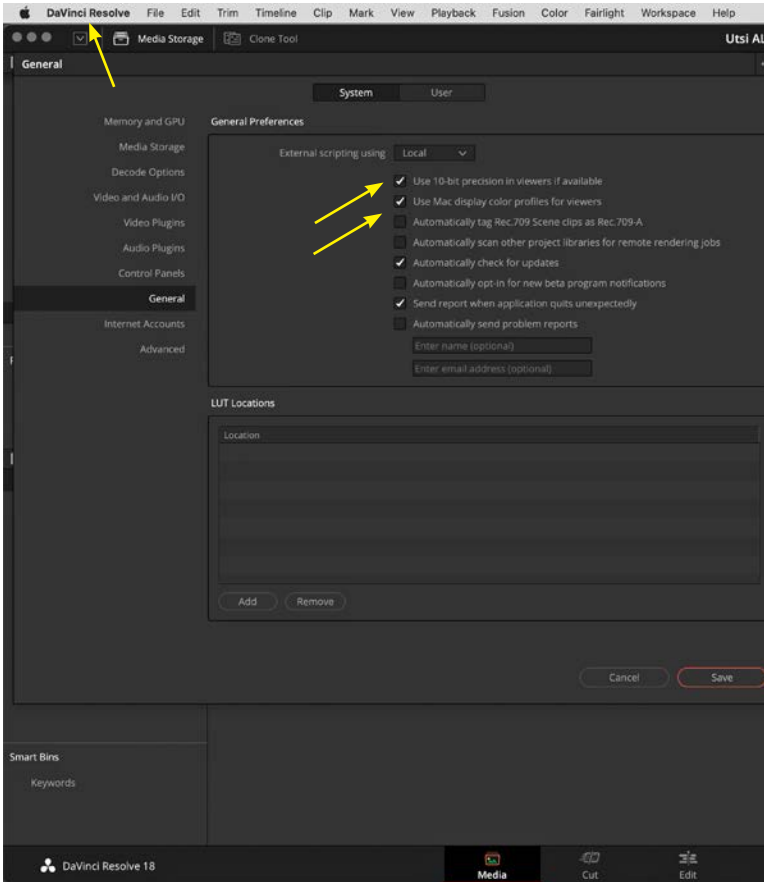
7. (Yellow arrows, at right) In the upper left menu bar, click DaVinci Resolve and go to Preferences... > General (Preferences) > and check "**Use 10-bit precision in viewers if available**."

And then check "**Use Mac display color profiles for viewers**."

8. Click Save.

9. Also be sure to have the correct Color Display in Apple System Preferences > Displays > Display Settings.

The correct ColorSync Profile for your monitor is important. (The profile may ship with your display.) You don't have to choose Rec.709 or any other profile to view Rec.709. This is all done by ColorSync which knows what your monitor is capable of and adjusts your Rec.709 viewer inside DaVinci Resolve to be displayed correctly for your monitor so that you see Rec.709 gamma and colorspace.



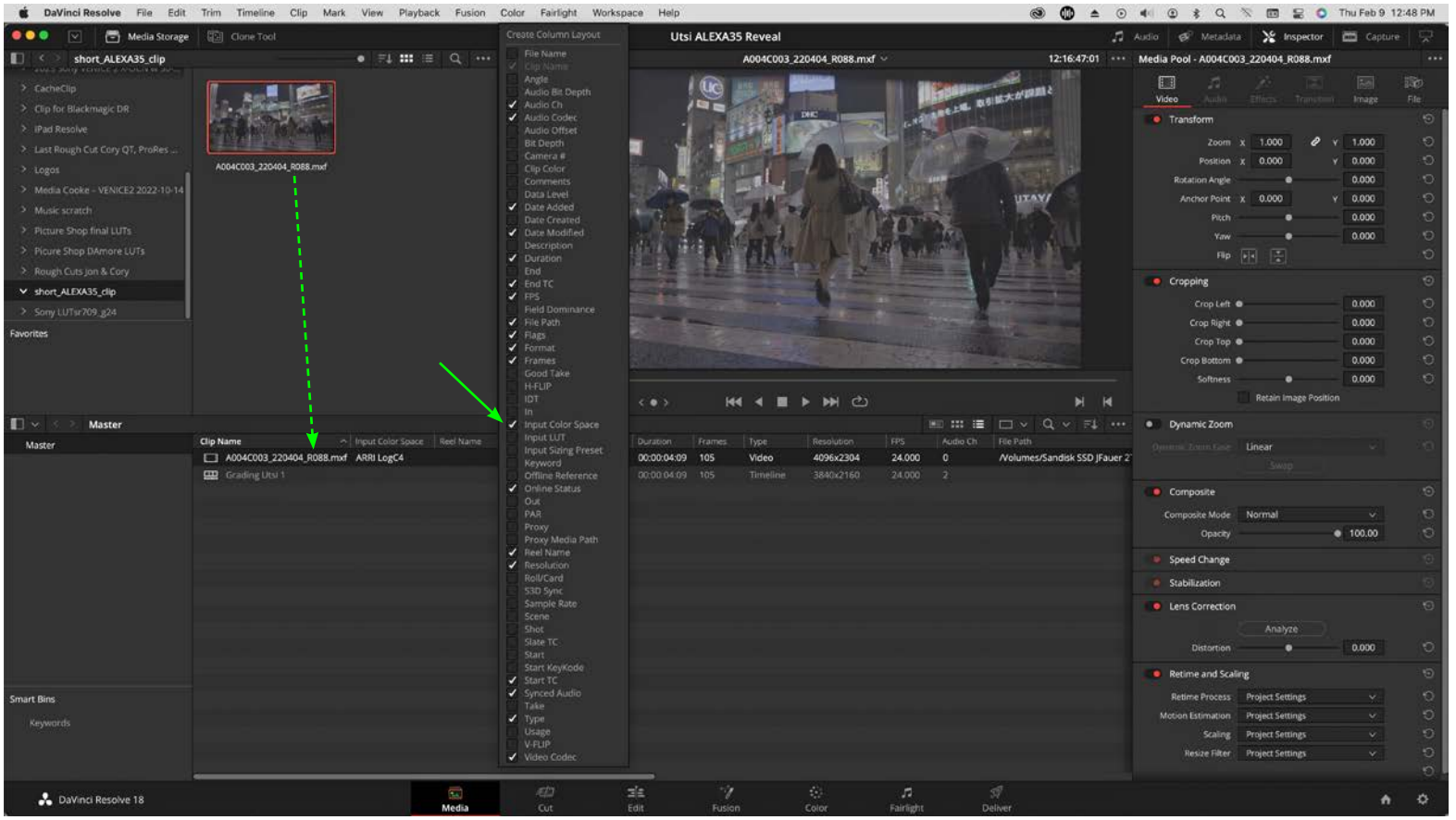
General Preferences

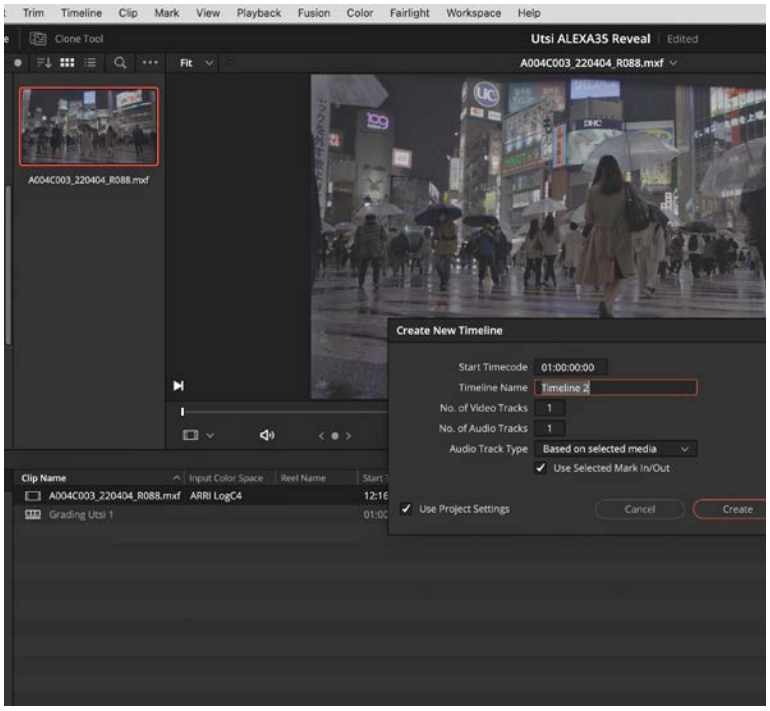
10. *(Green dotted arrow, below)* Drag your clip (or clips) from Media Storage into the Media Pool of your Project.

11. Click on "List View" to see the attributes next to your Clip Name. If "Input Color Space" is not listed, right click on the column names and put a check mark next to "**Input Color Space**," *(green arrow, below)*.

12. In the example below, we see that our ALEXA 35 clip of Shibuya Crossing (A004C003_220404_R088.mxf) is indeed in ARRI LogC4.

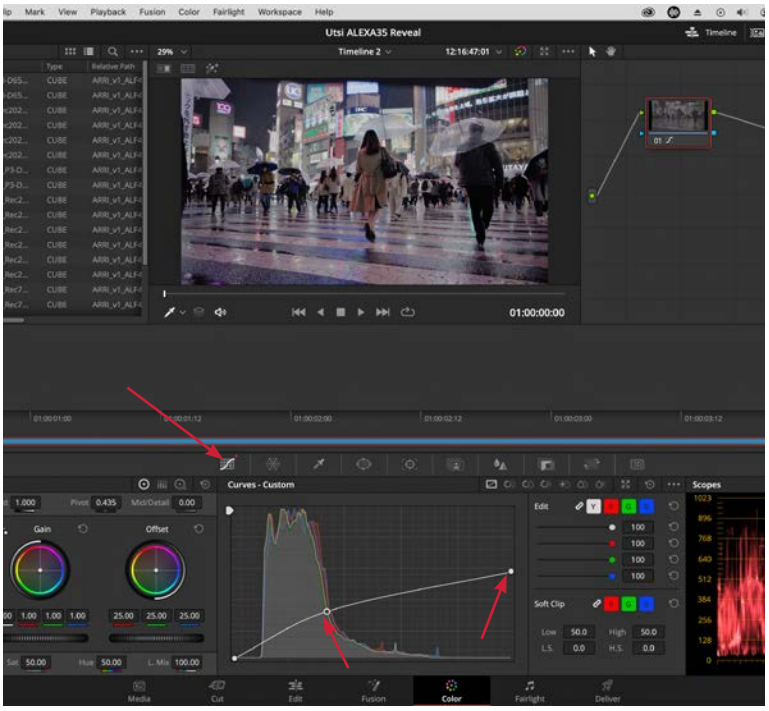
Media Storage, Media Pool and Input Color Space





13. *(above)* Right click on the clip and "Create New Timeline Using Selected Clips." Once you have it in a timeline, the Lookup Table is actually applied.

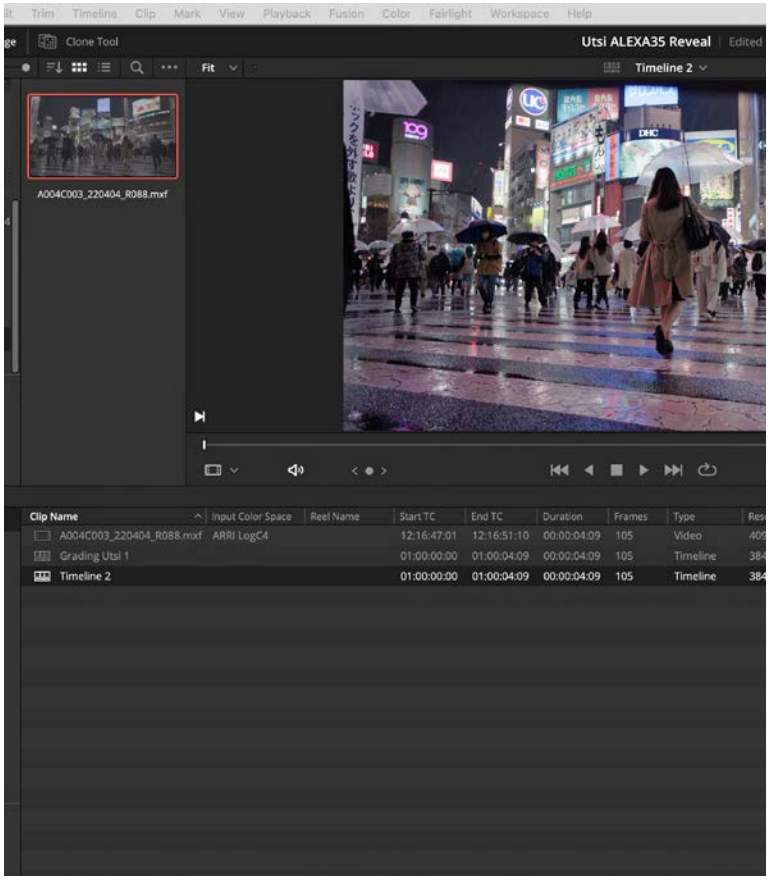
14. *(below)* Yikes, shadows are too dark and some highlights are burned out. Not to worry. You are grading 17 stops of ALEXA 35 footage with LogC4—no information is missing from the camera. Some highlight detail is missing because Rec.709 has a limited dynamic range.

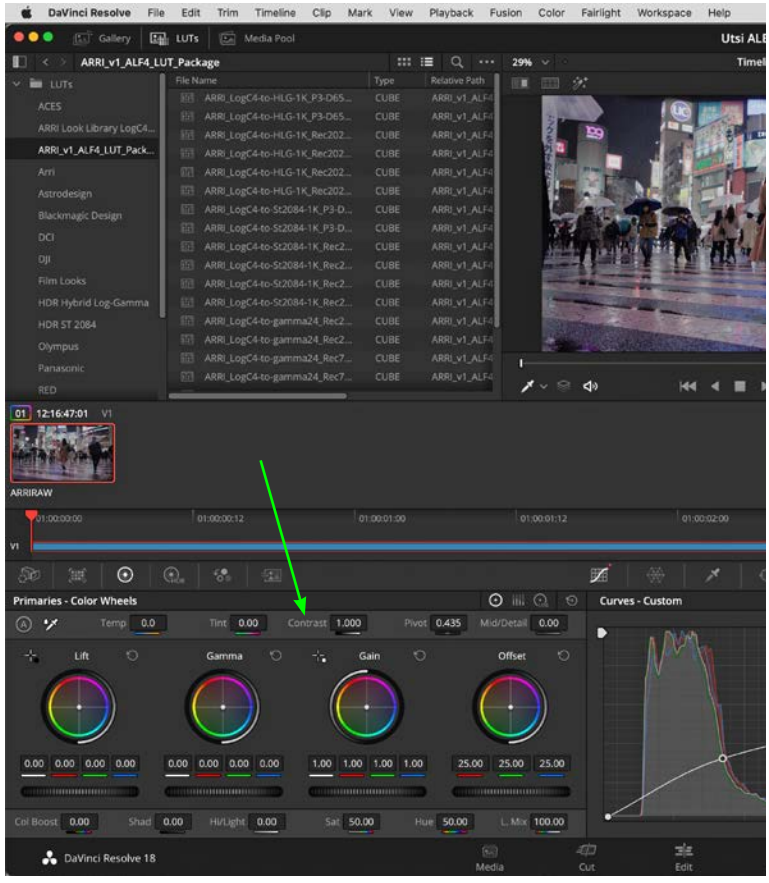


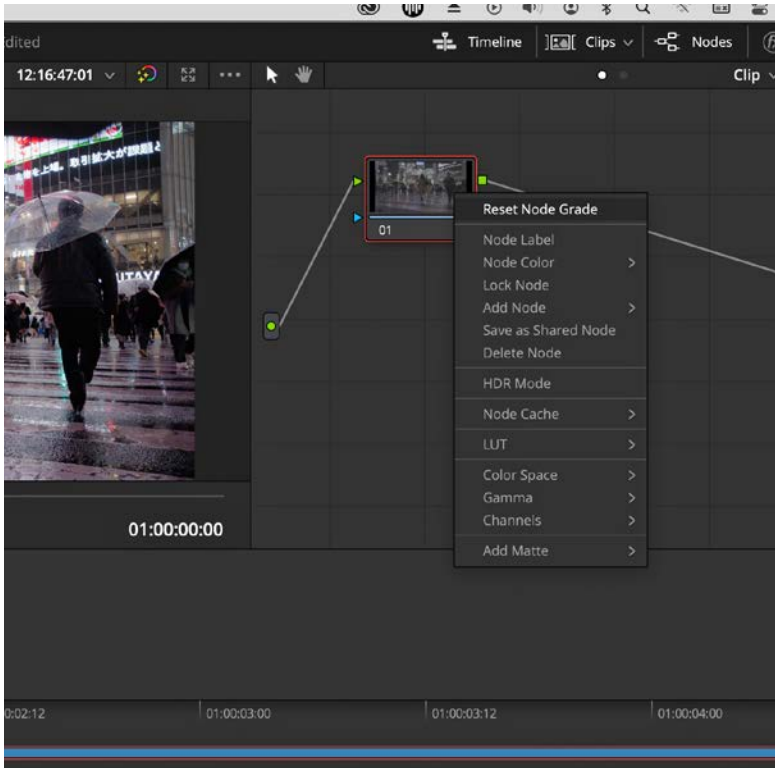
15. Let's go to work grading. Move to the **Color Page**.

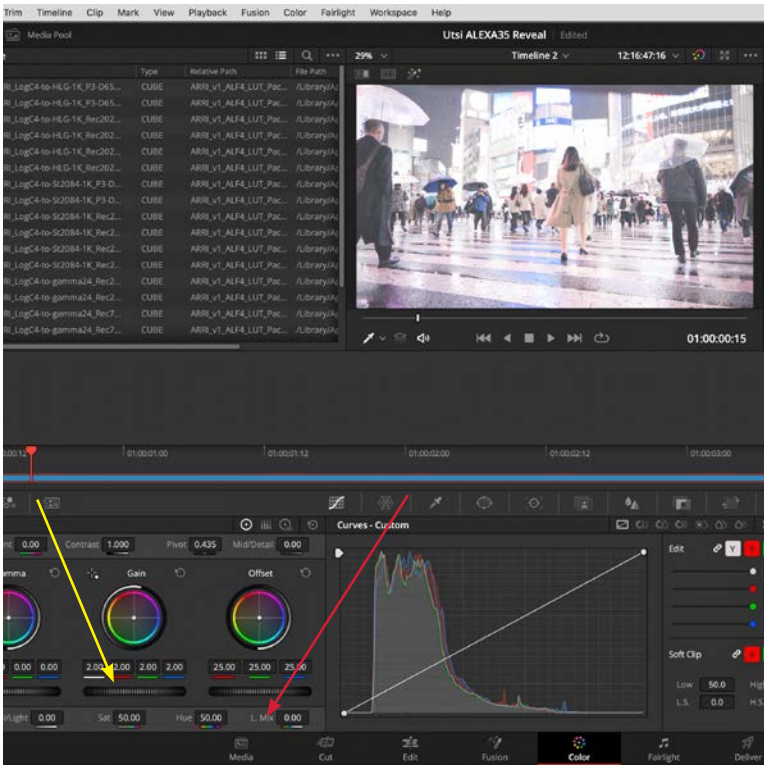
16. *(above)* In the Color Page, select "Curves - Custom." Add a point at about 40% in the curve. And then, drag the top right point down.

17. *(green arrow, below)* The **Contrast** control, just above Gain, is also a helpful adjustment.









18. You are creating a **Log-to-Log Look** and getting a lower contrast result. Colors have been restored to the highlights. You can toggle the node (Look) on and off with **Command-D** on the Mac keyboard. This is just a quick example.

19. Now, let's get to work and really grade the clip.

20. Utsi said, "I like to do a linear grade which resembles the lens aperture and camera white balance."

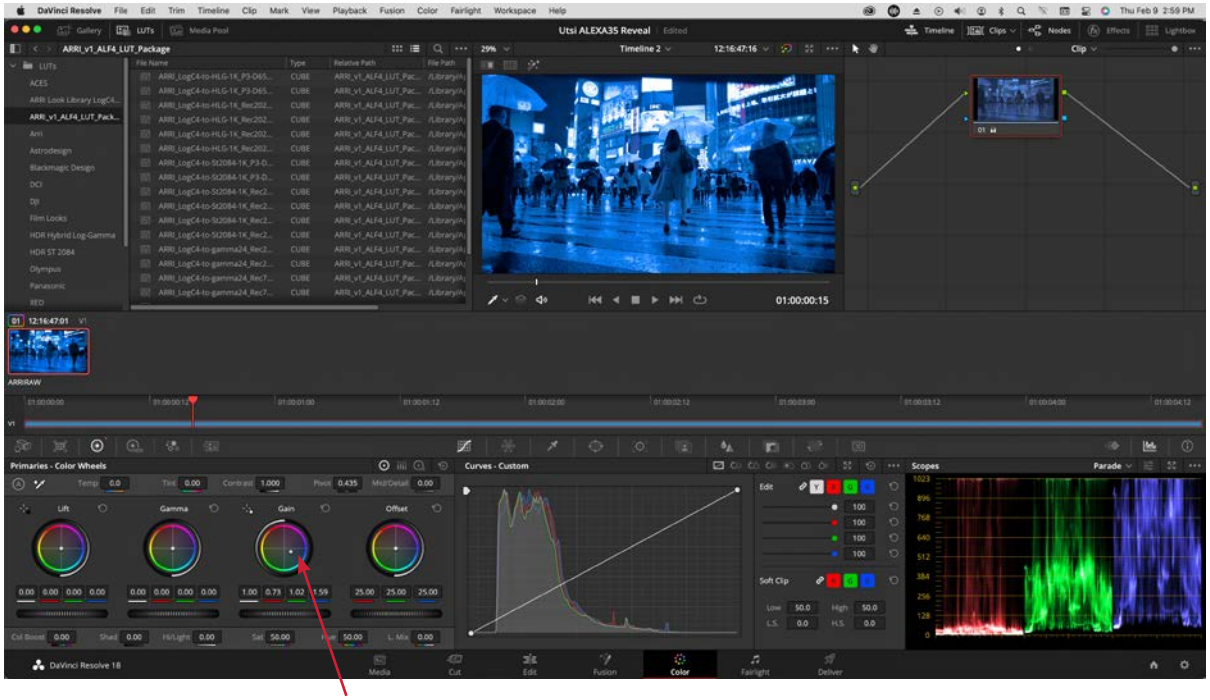
21. *(above)* Reset the node by right clicking > **Reset Node Grade**.

22. *(below)* Utsi continued, "Now, because we set the timeline color space to ARRI LogC4 in our project, we can do something very nice. *(blue arrows, below)* We can right click on the node and select **Gamma > Linear**. It's the second option at the top of the drop-down menu."

23. *(red arrow, above)* Change the **L. Mix value** (Luma Mix—in the window below Offset) from 100 to 0. The image has not changed visually. It's just that the controls work on your image in linear now. The Luma Mix is set to 0 so that your working in Linear RGB, rather than Linear RGBY which is the default in DaVinci Resolve.

24. Note that, in linear mode, your familiar Lift-Gamma-Gain grading does not work well with Lift, Gamma and Offset. In Linear Gamma, you only should adjust the **Gain**.

25. *(yellow arrow, above)* If you turn the **Gain** wheel to the right to a setting of 2.00, that increases the brightness of the image exactly one stop. "It's like changing the **ISO** in the camera. The shot gets more noisy, of course, but we are actually completely aligned with what happens in the lens or the camera doing it this way. This is the easiest way for a DP to grade an image."



26. *(red arrow, above)* "If you move the Color Dot inside the Gain control, it's like changing the **white balance** in the camera. The good thing for me as a colorist, it's one control. I'm changing the whole image. It's easy and I can match clips much faster doing it this way. The danger is if you touch the Lift control now, the image really breaks. I'm not aware of how you could lock off certain controls.

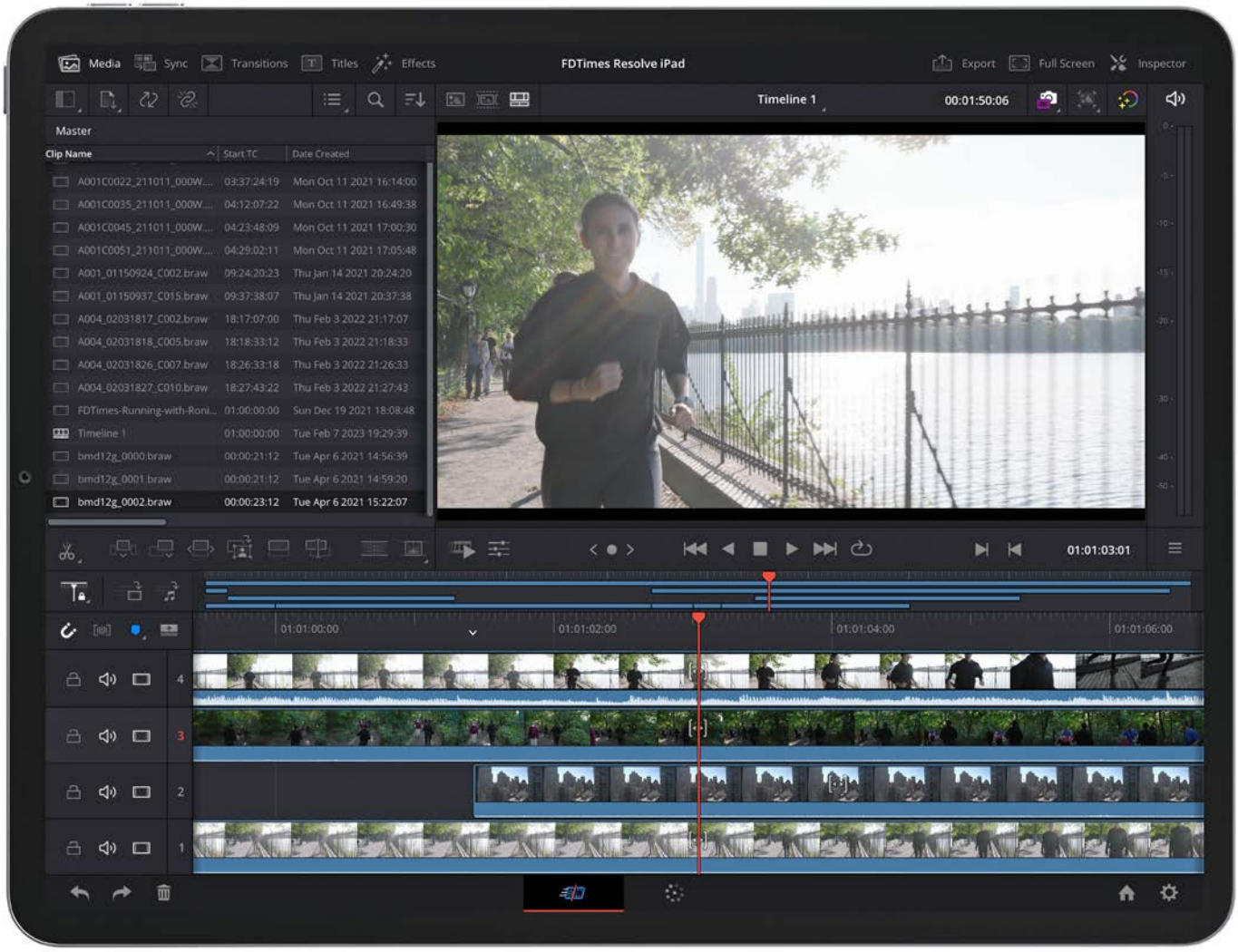
"This is the way I start primary grading and matching 80% of my footage and it is done in linear. I do it for most cameras. It is not specific to just the ALEXA 35."

27. There is another way of doing these linear adjustments that work with the HDR Primary Controls. If you move to the HDR Primary panel you will find the "Global" control on the right hand side, which behaves exactly the same way, because we have set our Timeline Color Space correctly to ARRI LogC4.

28. You probably want to send a framegrab to your colorist. In the top menu, select Color > Stills > **Grab Still**. On a keyboard, hit **Option-Command-G.** Open the Gallery. Right click on a frame to export the still and send it to your colorist.

29. Of course, with so many choices using ALEXA 35 and DaVinci Resolve, there's an entire ARRI Look Library to explore:

DaVinci Resolve for iPad



DaVinci Resolve is now on iPad. Does that mean giving up your comfortable grading suite with workstation, dual monitors, trackballed Advanced Panel, networked storage and giant OLED screen—for a 12.9" iPad Pro? Or, why not drive DaVinci Resolve on your new M2 MacBook Pro laptop instead? No, they all work together harmoniously.

Above all, DaVinci Resolve for iPad is so much fun. It is fast, portable, intuitive and opens up all kinds of possibilities for cutting and grading almost anywhere at any time.

Picture this. EXT. MATTERHORN SUMMIT – DAWN. Every portable pound counts. You got the shot, of course with a Blackmagic URSA Mini Pro 12K. It's the essential, missing, desperately-needed opening scene. The producer is pacing in the post production place 9,416 feet below, in Zermatt. It's a nail-biter because the final cut has to be screened at a film festival in an hour.

You unplug a Sandisk 2TB SSD from the URSA Mini Pro 12K, plug it into the USB-C connector of the iPad Pro M2, open DaVinci Resolve. The layout looks familiar. Open Project. Import Media from the SSD. Drag to timeline. Open Color Page. Grade. Export to Dropbox. This is Switzerland. Of course there's cell service at 14,692' on top of the Matterhorn. Of course, the Apple Pencil can be used with thick gloves that wouldn't be able to type on a laptop keyboard, keeping frostbite from your fingers.

Picture another scenario. INT. MAJOR FILM STUDIO – NIGHT. After a long day's journey into overtime, after a hundred takes, the actor finally got the lines right and it's a wrap. The DIT is downloading data, duplicating a drive destined to the post house. But wait, you're the DP and want to send a framegrab of a different grade for the dailies colorist to warm the scene up. You press the Apple Pencil on the shot in the Color Page and select GRAB STILL. Just as in desktop DaVinci Resolve, the framegrab appears in the GALLERY. Press the Apple Pencil on the framegrab and select EXPORT. Save it to iCloud Drive, Dropbox, external SSD, on your iPad, or share to other destinations.

Picture pre-production. You're bouncing around in a crew van, scouting locations somewhere in Bolivia. Inspiration appears as a new Show LUT, created serendipitously amid a great confluence of scenery, story and too much Singani brandy the night before. Out comes the iPad Pro M2. Media descends from the Dropbox cloud. You're creating a new camera LUT.

And so it goes. DaVinci Resolve for iPad is available as a free download on the Apple App Store. You can upgrade to DaVinci Resolve Studio for iPad as an in-app purchase from the home Project Page. I recommend the latest 12.9" iPad Pro M2. My older 11" iPad Pro 2nd generation was too small and too slow.

The latest iPads have a Thunderbolt / USB 4 port that connects

Blackmagic Design DaVinci Resolve on Apple iPad Pro M2 12", connected to Sandisk 2TB Extreme Portable SSD V2, and sitting on an OMOTON Upgraded Adjustable Tablet Stand Holder.

seamlessly with USB-C SSD drives as well as an external display. The beauty of DaVinci Resolve for iPad is its streamlined way of working with touchscreen and Apple Pencil alone. Apple Magic Mouse, Magic Keyboard or similar Bluetooth devices may make things easier when you want to spread out with a tablet stand holder and a Bluetooth DaVinci Resolve Speed Editor with buttons and a jog/shuttle wheel.

DaVinci Resolve for iPad opens, saves and exports media and project files that are standard with the desktop version of DaVinci Resolve 18. Supported file formats include H.264, H.265, Apple ProRes and Blackmagic RAW. I was not able to open ALEXA RAW or Sony X-OCN files, but maybe this could change.

Media is imported into DaVinci Resolve for iPad as you would with the desktop version—actually linked to files on iCloud, Dropbox, on the iPad and USB-C connected external drives. I recommend SSD storage. The maximum internal capacity of the latest iPad Pro is 2 TB, and like Oliver Twist, you will want more.

The Color Page is the star of DaVinci Resolve for iPad. When it's a company move and the DIT is packing up, you can amble over to the director and play the previous shot Full Screen, graded and presented in all its glory. All the desktop grading controls are there, from Lift-Gamma-Gain to Power Windows, SDR and HDR, tracking, effects, sizing (anamorphic desqueeze), stabilization and more. With it's intuitive touchscreen, the iPad Pro 12.9" makes DaVinci Resolve a breeze. You just might want to avoid that sugar-glazed craft service donut before touching the screen.

Original LOWEL TOTA

This is my original LOWEL TOTA Light. Ross Lowell gave it to me years ago when I was his camera operator. It still works.

The Tota Light was a brilliant design. Its reflectors folded over the front to protect the quartz halogen bulb. Tota and Omni lights were industry standards on documentaries everywhere.

But the first time they ventured onto a film set, electricians and grips were disparaging. Totas were not painted purple and were thought to be too delicate to survive banging around in a bin. That is, until John Alcott, ASC, BSC used Tota Lights everywhere and bounced them into his custom black umbrellas.

Ross Lowell never could resist a pun or poem. And so, with apologies to Elizabeth Barrett Browning:

How did we love Tota? Let me count the ways.
I loved thee to the depth (2.1"), breadth (8.2")
and height (13.4")
My gaffer can reach, when feeling out of sight
I love thee to the T-Stop of every day's
Most quiet need, by sun and candle-light.

Ross was a busy cinematographer and founder of Lowel Light. He rarely showed up on set without inventing something new to solve whatever situation hindered his progress. He invented Gaffer Tape when the duct tape commonly used to stick his original Lowel L-Light photoflood fixture took the wall paper off the wall of an expensive location. I think it was on *Naked City*.

Ross invented the popular Lowel D Light with chains to adjust tilt and focus when he became annoyed that the NY electric crew, not quite as tall as Pat Grosswendt or Colin Campbell in LA, had to use ladders. Crews, in turn, became annoyed with all the chains getting tangled up when packed, and promptly cut them off.

One of my first jobs at Vision Associates Productions was to bring cases of D Lights back to Lowel Light so those severed chains could be replaced. Ross told me that Stanley Kubrick was the only other person who liked those chains.

The warnings on Tota Lights were many. Operate in horizontal position only. Do not operate with doors closed less than 140°. Unplug before relamping. Avoid prolonged, close-up use as UV may affect eyes. Beware the scalding hot bulb.

New Lowel TOTA LED XL

Lowel TOTA XL Control box can clamp to a stand, adding extra sandbag-less stability or hang from its attached strap.

Lowel TOTA LED XL Specs

- Beam Angle: 60°
- Color Temperature: 5600 K ±200 K
- TLCI: >98 / CRI: >96
- Cooling System: Passive
- Dimming: 0% to 100% (1% increments)
- Light Intensity @3 ft.: 11,200 lx
- Number of LEDs: 216
- Expected Lamp Life: 50,000 hr.
- Size (HxWxD), Light (with mount): 13.4×8.2×2.1 in. (34×20.9×5.3 cm) Controller: 9.25×5.5×3.1 in. (23.5×14×7.9 cm)
- Weight, Light: 4.03 lb. (1.8 kg) Controller: 3.1 lb. (1.4 kg)
- AC Input Power: 90 to 240 V AC
- Power Source: AC or optional V-mount battery
- Max Power Consumption: 120 W
- Battery: 14.8 V
- AC Power Cord Length: 16 ft. (4.9m)
- DC Power Cord Length: 8.5 ft. (2.6m)
- Battery Plate: V-mount
- Fixture Mount: 5/8 in.

The original Tota Light with a 300W frosted quartz bulb gave you T8 at 24 fps, 800 ISO, 4 feet away.

And now, there's a new Tota. Tota Redux. Officially, Lowel Tota LED XL. The new Lowel Tota LED XL gives you T16 at 24 fps, 800 ISO, 4 feet away and draws less than half the current: 120W. You can plug at least 10 of them into the same circuit and not pop a breaker.

Like the original, the new Tota LED XL folds up to save space and to protect the light-emitting side of the fixture. It unfolds to provide variable beam spread from an area much larger than its packed size. This is very clever. Ross Lowell would have been proud.

tiffen.com/pages/lowel-tota-led-xl

Lowel TOTA LED XL

Hinged 3-section design folds down to half its width.
Metal body protects the LED panel during transport.

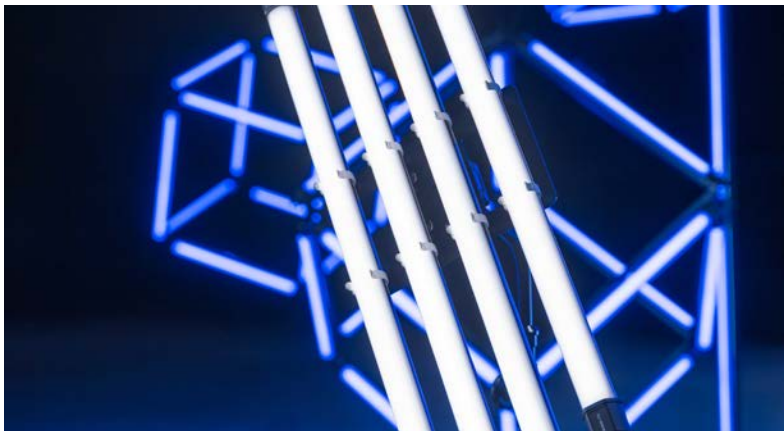
Mounts horizontally (above) or vertically (below) with 5/8" spud

216 LEDs and 3 removable diffusers.
11,200 lux, 60° beam,
flicker-free and dimmable (100% - 0%) in 1% increments.
Passive cooling—no fan—is studio INT ECU silent.

Control box combines power supply, dimmer, V-mount battery plate and AC adapter. Cables are nice and long.

As with most Lowel lighting fixtures, everything fits into a convenient case. This one is soft, with a custom foam insert.

Nanlite PavoTube II



Whether you use the PavoTubes as light sabers, light sources or lights as set design, the new PavoTube II 15C and 30C are major improvements over the originals. The PavoTube II 15C is about 30" long and the 30C is about 46" long—both familiar fluorescent sizes. But these are RGBWW LEDs with excellent color rendition. CCT range has been expanded to 2700-7500K with Green/Magenta ±150 adjustments. The PavoTube II 15C is 10% brighter and PavoTube II 30C is 20% brighter than the original models.

PavoTube II fixtures have built-in Bluetooth and 2.4GHz WiFi-modules that can be controlled by the NANLINK app on iOS and Android smartphones and tablets. CCT, HSI, brightness and FX modes can be controlled wirelessly. Wired DMX/RDM control is available individually or as groups.

PavoTube II 15C/30C fixtures have internal batteries. They are charged via the USB Type-C port that is PD3.0 (Power Delivery) compatible. This port is also used for an external power supply and firmware updates.

The diffused illumination area has been increased over the original model by using shorter caps on both ends.

PavoTube II 15C/30C have 15 effect modes—an increase from the original 6, and are now similar to other recent models from NANLITE.

A variety of accessories are available for PavoTube II 15C/30C, including barndoors, eggcrates, clips and stands.

PavoTube II 15C & 30C Features:

- RGBWW LED color mixing.
- High color rendition: CRI avg 97, TLCI avg 98, TM-30 Rf avg 94, TM-30 Rg avg 101.
- CCT Range: 2700K-7500K with ±150 Green/Magenta.
- Controls: two knobs and one button.
- Dimming: 0-100%.
- PavoTube II 15 C output: 423 Lux (39.3 fc) at 1m, 5600K.
- PavoTube II 30 C output: 647 Lux (60 fc) at 1m, 5600K.
- 15 Built-in practical effects: hue loop, CCT loop, INT loop, CCT flash, hue flash, CCT pulse, hue pulse, storm, police car, TV, paparazzi, candle, fire, disco, bad bulb, firework, explosion, welding.
- 2.4GHz WiFi, Bluetooth, NANLINK app, DMX/RDM.
- USB-C port for PD3.0 (Power Delivery) charging, power supply and firmware updates.
- Batteries: PavoTube II 15C has 14.8V/2200mAh lithium.
  PavoTube II 30C has 14.8V/4400mAh lithium.
- Run time: 1 hour 26 mins at full brightness on int. batteries.
- AC power adapter: included 15V/2A (15C) or 15V/4A (30C).
- Metal housing, three ¼-20 threaded mounts.

Nanlite PavoTube II

PavoTube II 30C (shown here) and 15C are available as individual fixtures or in kits.

USB Flash drive for firmware updates

Control Knobs

DMX and Ext. Power Connections

Wire loop to hang PavoTube II

On / Off

Control Knobs

NANLITE Forza II

COB: Chip On Board LED

Call it a COB Light, Point Source, Monolight or Strobe-style. Chip On Board LED fixtures bond an array of LEDs together into a single module. The result is a harder-edge, single source of powerful LED light that can be shaped, bounced, diffused, modified or projected. Think of a COB as a familiar open face fixture compared to the soft, spread-out structure of SMD (Surface Mounted Device) LED panels.

Denis Lenoir, ASC, AFC once said, "Open face quartz lights can do everything. Maybe not so well, but everything."

NANLITE's new Forza II Point Source COB light fixtures can do almost everything, and do all those things very well. They are cool, powerful and plug into wall sockets. The new series II Forza fixtures are upgrades from the first generation introduced three years ago: brighter, quieter, more ergonomic.

There are 3 sizes:

- NANLITE Forza 60 II and 60B II (72 Watts),
- NANLITE Forza 300 II and 300B II (350W),
- NANLITE Forza 500 II and 500B II (580W).

"B" stands for variable CCT of 2700-6500K with ± 80 Green/Magenta. The standard model is fixed at 5600K daylight.

Forza 60 II and 60B II

Forza 60/60B II have on-board 2.4GHz WiFi, Bluetooth and DMX/RDM. Fan noise has been lowered to 20dbA—quieter than the PA whispering into a cell phone.

From its ultracompact and lightweight (1.85 lb / 0.84 kg) body, Forza 60/60B II puts out 318 footcandles at 3.3 feet (1m).

NANLITE Managing Director Nancy Zheng said, "If you think of Forza 60/60B II as just the appetizer, then Forza 300/300B II and 500/500B II are the main course." Or as Sal Martorano, a beloved Gaffer famously said, "Why use a 2K when you could have a 10K with scrims?"

Forza 300 II and 300B II + Forza 500 II and 500B II

Forza 300/500 II and 300B/500B II have a glass protector for the COB module. CRI/TLCI ratings are 96/97.

The compact control box has a built-in power adapter for V-mount battery plates that are located on both sides. You can hot-plug from AC to DC or hot swap between two batteries.

The curved yoke locks with one lever and has a quick release. 2.4GHz WiFi, Bluetooth and DMX/RDM are onboard. The NANLINK app on iOS and Android connects. Customizable effects include CCT Loop, INT Loop, Flash, Pulse, Storm, TV, Paparazzi, Candle/Fire, Bad Bulb, Fireworks, Explosion and Welding.

Fixtures come with a standard Bowens mount and an extra umbrella mount. Various modifiers, diffusions, softboxes, and umbrellas from NANLITE and others can be attached easily.

Firmware updates via flash drive use the built-in USB-A port.

NANLITE Forza II

Forza 60B II.

Rear control panel of Forza 60B II.

Forza 60B II with Fresnel front lens and barndoors.

Forza 60B II with Softbox and Eggcrate.

Forza 60B II with Softbox Lantern.

Forza 60B II with Umbrella.

Forza 60B II with Softbox Strip and Eggcrate.

Forza 60B II kit.

Forza 500B II with Control Box and dual V-Mount Batteries.

Canon CINE-SERVO 15-120mm T2.95-3.95 EF/PL

Here's an 8:1 Super35 zoom lens that widens to 15mm for those *Birdman* or *Revenant* close and wide handheld shots—and then zooms in to 120mm for tight ECU portraits when you're on sticks, dolly or crane.

The Canon CINE-SERVO 15-120mm T2.95-3.95 EF/PL (CN8x15 IAS S) was announced in September 2023 and is shiupping now. The CINE-SERVO 15-120mm is compact (11.3 inches long) and light (7.5 lb).

For Super35, it covers 15-120mm with a T2.9 maximum aperture to 90mm that ramps to T3.95 at 120mm.

A built-in extender/expander gives you 22.5-180mm in both Super35 and Full Frame, with a T4.4 to 135mm that ramps to T5.9 at 180mm.

I usually hesitate to get into a K race for lenses, but Canon states that the 15-120 was designed for 8K optical capture at all focal lengths with consistently high image quality across the entire frame all the way to the edges.

The CINE-SERVO 15-120mm T2.95-3.95 EF/PL matches the existing range of Canon's cinema lenses in warmth and smooth skin tones. The 11-blade iris produces pleasing, round bokeh.

The EF mount communicates with the camera and provides lens metadata via Canon's well-established protocol with 8 contacts in the 6 o'clock position at the rear of the mount.

The PL mount version of the lens is the first Canon CINE-SERVO lens with both ZEISS eXtended Data (XD) and Cooke /i Technology lens metadata via 4 contacts in the traditional /i 12 o'clock position.

Lens data is supplied by 16-bit encoders in the lens barrels, as with Canon's other CINE-SERVO lenses, to provide accurate focus, iris and zoom data, along with lens type.

The CINE-SERVO 15-120mm T2.95-3.95 EF/PL zoom lens is available in EF or PL mount. As with the other CINE-SERVO lenses in this family, you can send the lens to a Canon Factory Service Center to exchange between EF and PL mounts.

Canon CINE-SERVO 15-120mm T2.95-3.95 EF/PL

Top with servo handgrip attached

Bottom with servo handgrip attached

Right side with servo handgrip attached

Bottom, servo removed

3/4 front left with servo handgrip attached

Front with sunshade and servo handgrip attached

The Servo Motor Drive unit is powered via its 12-pin Hirose connector. It can be connected directly into a supported camera or externally via a D-Tap cable and battery. The servo motor drive unit is detachable.

Note: when using lens motors with wireless FIZ systems, the focus ring has a standard 0.8 M gear pitch, but the Iris and Zoom rings are vexingly 0.5 M. So, be sure to have 0.5 M gears on hand.

The drive unit's hand grip and zoom rocker are there for ENG/ shoulder-resting/ doc style camera operating. The servo drive has two 20-pin ports for external zoom and focus controls. A third 20-pin connector provides 16-bit encoded metadata that is helpful for virtual production.

Front view with sunshade and servo handgrip removed

A Review of Canon Cine Zoom Lenses

2011: 14.5-60 mm T2.6 Zoom
Length: 12.52 in. / 318.0 mm
EF and PL Mount
Weight: 9.9 lb. / 4.5 kg
Front Diameter: Ø 136mm
Image circle: 29.6 mm

2011: 30-300 mm T2.95-3.7 Zoom
Length: 13.78 in. / 350.1mm
EF and PL Mount
Weight: 12.79 lb. / 5.8 kg
Front Diameter: Ø 136mm
Image circle: 29.6 mm

2012: 15.5-47 mm T2.8
Length: 8.4 in / 214 mm
EF and PL Mounts
Weight: 4.9lb / 2.2kg
Front Diameter: Ø 114 mm
Image circle: 29.6 mm

2012: 30-105 mm T2.8
Length: 8.3 in / 210 mm
EF and PL Mounts
Weight: 4.9lb / 2.2kg
Front Diameter: Ø 114 mm
Image circle: 29.6 mm

2014: 17-120 mm T2.9-3.9 Zoom
Length: 10.04 in. / 254.9 mm
EF and PL Mount
Weight: 9.9 lb. / 4.5 kg
Front Diameter: Ø 114mm
Image circle: 31.7 mm

2014: 50-1000 mm T5.0-8.9 CINE_SERVO Wgt: 14.55 lb / 6.6 kg
Length: 15.95 in. / 405.2 mm
EF and PL Mount
Front Diameter: Ø 136 mm
Image circle: 31.4 mm

2016: 18-80 T4.4 Zoom
Length: 7.2 in / 182.3 mm
EF Mount
Weight: 2.6 lb / 1.2 kg
Front Diameter: Ø 84 mm
Image circle: 31.4 mm

2017: 70-200 mm T4.4 Zoom
Length: 7.2 in / 182.3 mm
EF Mount
Weight: 2.76 lb / 1.25 kg
Front Diameter: Ø 84 mm
Image circle: 31.4 mm

Canon Cine Zoom Lenses

2020: 25-250 mm T2.95-3.95 CINE-SERVO Wgt: 6.7 lb / 3.06 kg
Length: 10.8 in. / 274 mm Front Diameter: Ø 114 mm
EF and PL Mount Unofficial Image circle estimates:
S35: 29.61 mm
FF: 44.42 mm Ø w/ Extender/Expander

2022: 20-50 mm T2.4 Flex Zoom Weight: 7.3 lb / 3.3 kg
Length: 9.2 in / 233.3 mm Front Diameter: Ø 114 mm
EF and PL Mount Image coverage: Full Frame

2022: 45-135 mm T2.4 Flex Zoom Weight: 7.5 lb / 3.4 kg
Length: 9.4 in / 238.4 mm Front Diameter: Ø 114 mm
EF and PL Mount Image coverage: Full Frame

2022: 15-120mm T2.95-3.95 Zoom Weight: 7.5 lb / 3.40 kg
Length: 11.3 in. / 286.9 mm Front Diameter: Ø 114 mm
EF and PL Mount Unofficial Image circle estimates:
S35: 29.61 mm
FF: 44.42 mm Ø w/ Extender/Expander

Canon Servo Drive Unit

Detachable Canon Servo Drive Unit / Handgrip is shown on Canon CINE-SERVO 25-250 mm T2.95-3.95 lens, below.

The Servo Drive Unit enables smooth zooming, with precise speeds from fast to slow, and minimum backlash. Iris control is responsive, also with minimum backlash.

12 Pin Serial Communication via fixed cable

Focus witness mark

Iris and Zoom witness mark

Three 20-pin connectors for externally operated accessories for Zoom/Focus/Iris (FIZ controls with 20pin broadcast connections) and metadata output from 16-bit absolute encoder for virtual studio systems.

Focus scale in Meters

Focus scale in Feet

SIGMA 50mm F1.4 DG DN | Art Lens

L-R: SIGMA 20mm F1.4, 24mm F1.4, 35mm F1.4, 50mm F1.4, 85mm F1.4 DG DN Art Lenses

Minimum focus:	45cm / 17.8 in. (1:6.8)
Filter size:	72mm
Dims (Max. Ø x Length):	78.2 x 109.5mm / 3.1 x 4.3 in.
Weight:	670g / 23.6 oz.

SIGMA announced its fifth F1.4 DG DN Art prime lens designed exclusively for Full Frame mirrorless systems—the 50mm F1.4 DG DN | Art.

(DG = Full Frame, DN = mirrorless-exclusive, in L-Mount or E-mount).

It has improved optical performance, a new optical design, and is smaller than the SIGMA 50mm F1.4 DG HSM | Art, which was designed for DSLR cameras.

The 50mm F1.4 DG DN | Art lens has fast, silent HLA auto-focus (High-response Linear Actuator) first introduced in the 60-600mm DG DN OS | Sports lens (*below*). Both lenses are dust- and splash-resistant. The 50mm F1.4 DG DN | Art lens has a manual/auto aperture ring with click on/off and lock switches, an AFL button and 11 rounded aperture blades.

By the way, SIGMA is currently the largest independent lens manufacturer in the world.

SIGMA 60-600mm F4.5-6.3 DG DN OS | Sports Lens

60-600 on SIGMA fp L with pivoting EVF

Minimum focus:	45-260cm / 17.8-102.4 in
Maximum magnificaton	1:2.4 at 200mm
Filter size:	105mm
Dims (Max. Ø x L):	119.4 x 279.2mm / 4.7 x 11.0 in.
Weight:	2,495g / 88.0 oz.

The SIGMA 60-600mm F5-6.3 DG DN OS | Sports has an extraordinary range for a zoom lens this small and light. It covers Full Frame, comes in L-Mount or E-mount, is compact and lightweight.

The optical design corrects chromatic aberration that tends to occur in the ultra-telephoto range by using a variety of glass materials, including FLD and SLD glass elements. At 200mm, the maximum magnification ratio is 1:2.4, making it a telephoto macro lens.

The new Optical Stabilization OS2 algorithm significantly improves image stabilization performance by 7 stops at the wide end and 6 stops at the telephoto end. OS Mode 1 is good for general shooting, and Mode 2 is for panning shots.

OPTICA MAGNUS Finder

OPTICA MAGNUS photos by Bill Bennett, ASC

The OPTICA MAGNUS Full Frame Finder is an optical viewfinder system, compatible with all sensor formats (Super35, Ultra 35, Open Gate, FF, VV and LF) up to an image diagonal of 46.31mm. It is easy to use, lightweight, ergonomic and has an extremely bright groundglass.

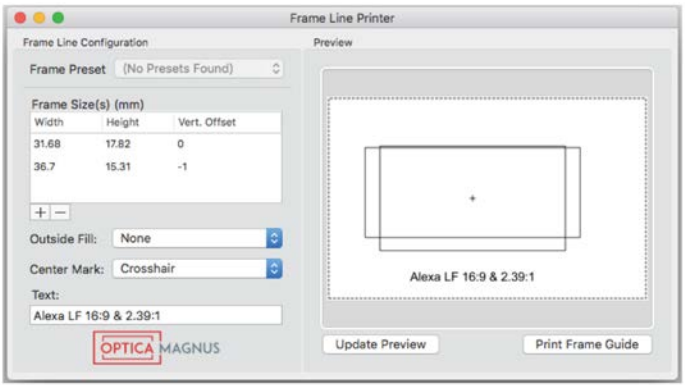
OPTICA MAGNUS has a unique frameline system that uses a clear polyester slide placed in front of the groundglass for standard and custom aspect ratios. The frameline overlays can be swapped quickly. An app let you design and print these frameline overlays. Considering the Clairmont Ground Glass Guide was 92 pages long, with hundreds of permutations, the clear polyester overlays of OPTICA MAGNUS have a big advantage.

It works with both spherical and anamorphic cine lenses. Anamorphic desqueeze modules are easy to swap. Unscrew the cap with 4 screws, replace the module, screw on the cap. Anamorphic desqueeze factors currently include 1.5x-1.65x and 1.8x-2.0x..

OPTICA MAGNUS is available with interchangeable stainless steel PL and LPL lens mounts. Other lens mounts are available on special order.

- Pivoting Handgrip.
- Adjustable eyepiece diopter
- Ground Glass System with acetate frameline slides
- Customized app generated and printed frameline slides.
- Eyepiece changeable for Super35 and Full Frame.
- HD Video Assist, available fall 2023.

OPTICA MAGNUS, owned by Kish Sadhvani and Kees Van Ooostrum, ASC, is sold and distributed in the US by AbelCine. *opticamagnus.com*



Anamorphic desqueeze modules, 1.5x - 1.65x *above* and 1.8 - 2x *below.*

Front view showing frameline overlay, *above.* Swapping anamorphic module, *below.*

At left: design your frameline overlays with the FrameFinder app, available for Mac or Windows. Multiple aspect ratios can be combined. Dimensions are defined in millimeters. Print the overlays on a laser printer.

Blackmagic Ultimatte 12

Ultimatte 12 HD Mini

Ultimatte 12 HD

Ultimatte 12 4K

Ultimatte 12 8K

Once upon a time, not so long or far away, blue screen and green screen for cine production was expensive and annoying. As a DP, you often had to pre-light a green screen set without the benefit of an Ultimatte system. The reason was cost. Ultimatte during pre-light often required an extra day of rental and an operator—expenses the producer was delighted to cut from the budget. So you were lighting without instruments, fingers crossed that the dreaded green spill was minimal and the shiny patent leather shoes worn by the actress could be rescued.

Sam Nicholson has said that he loves shooting on LED volumes and working in real time on set, "because green screen is like sensory deprivation for actors, directors and cinematographers." Nevertheless, while LED active backgrounds are all the rage, blue and green screens are still prevalent on motion picture sets, not to mention TV broadcasts, news and weather.

Now, Blackmagic Design has once again democratized and made affordable (affordablized?) four new models of Ultimatte real time compositing processors:

- Ultimatte 12 HD Mini ($495). Powerful entry-level; has both SDI and HDMI connectors.
- Ultimatte 12 HD ($895). High performance 3G-SDI.
- Ultimatte 12 4K ($2,495): 12G-SDI; handles UHD 4K and HD.
- Ultimatte 12 8K ($6,995): Quad Link 12G-SDI for HD, UHD 4K and 8K.

If you're reading FDTimes, you're probably not shooting the 6 o'clock news or doing the weather. But having one of these Blackmagic Design Ultimatte 12 virtual set keyers can rescue you from the film director's dreaded criticism, "Yikes, your lighting looks like the 6 o'clock news."

Chances are, on features and high-end commercials, you're not even keying with Ultimatte. The green or blue screen background will be replaced by VFX teams in post. But the process is similar in that your live-action foreground elements are treated as mattes. And having one of Blackmagic's Ultimatte 12 devices will be of enormous help.

FDTimes tried the basic Ultimatte 12 HD. Not only is it like a lifevest for green or blue screen work, it also provides hands-on tutorial time to delve into the mysteries of keying. The accompanying Blackmagic Ultimatte Manual is a good textbook with articulate explanations of mattes: background, garbage, holdout, layer, and primary matte. The Manual is available for free: *blackmagicdesign.com/support/family/ultimatte*

All models of Ultimatte 12 have built-in frame store so you can key using stills, instead of live video, as backgrounds.

I found this very useful to check how our lenses for foreground live-action would composite onto a background. This can be helpful to show a VFX supervisor that your super-distorted, vintage, distressed, wide angle lens actually might work against a pristine virtual background. You can check the composite in real time, on set, with a still frame loaded into the frame store.

All Ultimatte 12 models include free Ultimatte Software Control for Mac and Windows. Connect the Ultimatte 12 device via Ethernet to your computer or network switch. The Ultimatte Software Control GUI interface is kind of retro and fun. It may remind you of something out of Jules Verne, complete with analog style virtual dials that rotate as you drag your mouse.

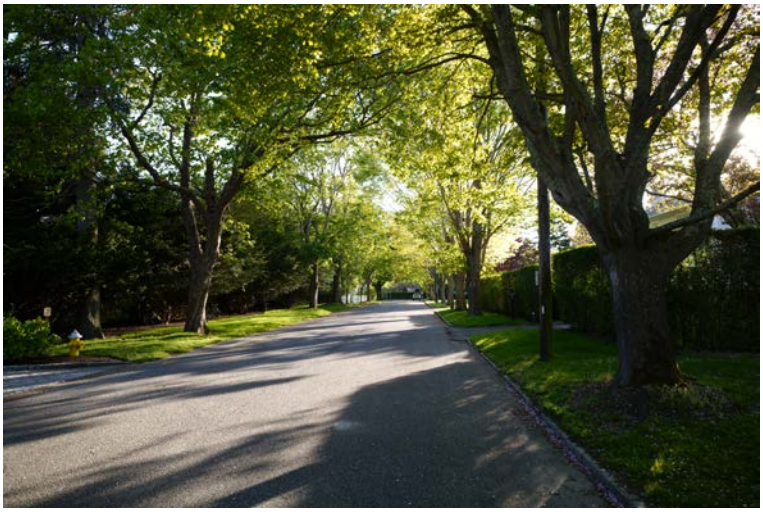
The main window has tabs at the top to adjust matte, foreground, background, layer, matte in and settings. Improved flare algorithms in Ultimatte 12 let you dial in the amount of Flare Control to remove distressing green or blue spill. This is where you can go to work rescuing those patent leather shoes that disappeared because of green reflections, and where you can clean up noisy green shadows. Ultimatte 12 automatically samples the colors, creates mattes for walls, floors and other parts of the image, and then applies the necessary corrections.

If your Zoom or Teams meetings cry out for better background keying, the inexpensive Ultimatte 12 HD Mini can go to work in between its regular jobs. Plug in a mirrorless camera as a web-cam via the HDMI port and add an awesome background with the Ultimatte 12 HD Mini. Or connect multiple cameras via an ATEM Mini switcher the way Blackmagic's Bob Caniglia did on an impressive video conference session to explain Ultimatte 12.

Blackmagic Ultimatte 12 HD Mini

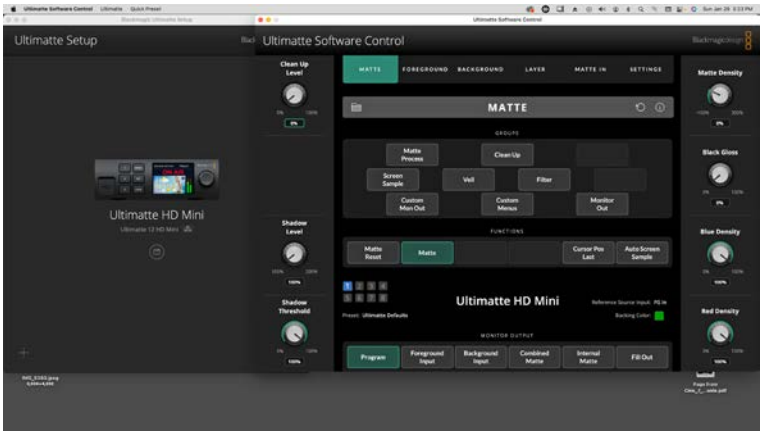
Blackmagic Ultimatte 12 HD Mini - front

Blackmagic Ultimatte 12 HD Mini - rear



Background plate. 20mm SIGMA DG DN Full Frame at f/5.6.

Background loaded into Ultimatte 12 HD Mini's frame store and viewed on monitor. You must first convert your original file to HD 1920 x 1080 before loading it with Ultimatte Software Control.



Blackmagic Ultimatte Setup, at left, allows you to connect Ultimatte device to your computer or network switch via Ethernet. Ultimatte Software Control, at right, controls the process.

Live foreground against green screen composited over frame-stored background. Fuzzy foreground edges can be cleaned up with Ultimatte Software Control. My lighting could be cooler, darker, single source.

O Sing Pui, HKSC "found" these images with Signature Primes and Impression V Filters in Hong Kong.

ARRI Impression V Filters for Signature Primes

ARRI Impression Filters attach magnetically to the rear of Signature Primes. They launch in February at BSC Expo with a set of 8 Impression V rear diopter filters. V might stand for Vintage as these rear diopters add a soupçon of vintage look by adding aberrations that the Signature Prime lens designers diligently had removed. Thorsten Meywald, ARRI Product Manager Optical Systems, explains the Impression Filter system:

The philosophy behind the ARRI Impression rear filters is to make different looks as accessible as possible for the user. Maybe you have the idea to change your look spontaneously on set. How is this best achieved? Well, you could get a different lens, maybe a vintage lens, but if you are mainly working with modern lenses then that may not be what you want. A 40-year-old vintage lens might not intercut well with a modern lens; the look could be very different, and there are variables. For example, there are some vintage Super Speeds in good condition, and there are other Super Speeds that are ready for the service department. Vintage lens coatings can fade. Mechanically, they are not always reliable. Focus can be shifty.

For ease of operation, it may be better to start with a modern lens. It probably has lens metadata built in, which is very useful. So, you start with a pristine lens and then you deteriorate the image in a repeatable way. That is what we are doing with our new line of rear-mounted Impression Filters, which we are launching with a set of Impression V Filters for vintage-inspired looks. We call them filters, but in fact they are diopters—they are sophisticated glass elements that affect the spherical aberration of the lens, as well as field curvature, chromatic aberration or lateral color, and coma.

Spherical aberration is an optical imperfection that happens when incoming light rays in a lens focus at different points. For example, the center of the image may be in focus, but the edges are not. The image can appear fuzzier towards the edge of frame. “Positive” spherical aberration means the rays are bent too much. “Negative” spherical aberration means the rays are not bent enough. As these spherical aberrations become stronger, you also affect the center of the lens.

We are offering 8 different rear Impression V Filters, and they fit every Signature lens—all 16 primes, 4 zooms, and the extender—because we have a uniform rear LPL mount interface. Impression Filters attach quickly and easily to the back of the lens with magnets, just like the net holders that come with Signature lenses.

There are 4 negative diopters and 4 positive diopters in the Impression V Filter Kit. What is the difference? If you over-correct or under-correct spherical aberration, it influences the style of your out-of-focus image areas. Also called bokeh, they are not just the out-of-focus highlights. It’s the entire image. But

330 Positive Impression V Filter (at left) magnifies an image.

290 Negative Impression V Filter (at right) appears to reduce the image on a printed page.

it's most obvious with the out-of-focus highlights. If you over-correct spherical aberration with a negative diopter, look at the out-of-focus highlights in the background—you see so-called "donut" shapes, a bright outer ring that gets darker towards the center. At the same time, you see "Christmas ball" out-of-focus highlights in the foreground—a bright spot in the center, with a fall-off in illumination at the outer edge. And with a positive diopter the opposite occurs: "Christmas ball" bokeh in the background and "donut" bokeh in the foreground.

The only way to achieve these effects easily is to start with lenses, such as the Signature Primes, that have neutral spherical aberration, or we would say—no spherical aberration. Then you have out-of-focus highlights that are uniformly illuminated. And so, with 4 positive and 4 negative filters, we offer different strengths. You can start with a very mild effect that still looks like a modern lens, or a very good vintage lens. And you can progress in strength from there.

If you are using the strongest Impression V Filters, then our engineering colleagues from the optical team might say, "But you destroyed the image." Well, that's a matter of personal taste. When we analyze a Signature Prime, the MTF is very high. We are at 95% for 10 and 20 line-pairs from the center towards the corners. We also have high contrast, with 40, 60 and 80 line-pairs even at full, wide-open aperture. But when you use the strongest filters, we only see 10 line-pair readings at 60%. The fine structures are no longer discernible.

However, that's exactly the behavior of vintage lenses. We know that Speed Panchros provide a nice image, but if you put a very old Speed Panchro on an MTF test bench and just look at the technical details of MTF and resolution, you might say, "Hmm, it's not a good lens." You'd be nowhere near 80 line-pairs, wide open. Maybe when you stop down, but not wide-open. And now we can a simulate that kind of vintage lens behavior with Impression V Filters on Signature lenses in a very user-friendly way.

If you use a strong diopter, you affect not only the out-of-focus bokeh, but also the overall focal plane, and your image gets softer. And when you stop down, you're getting more contrast and also more resolution. At wide-open aperture, you see the strongest effect. When you start to stop down, the effect diminishes. At around T5.6, you barely notice it and the image looks like a very good lens once again.

So, you can control the effect of both the bokeh and the image fall-off towards the corners with the strength of the filter and also with the aperture. You have different choices. I think this

variability is important because it provides some freedom for cinematographers. Most probably they will use different kinds of filters and not play with the aperture, because that also influences the depth of field and the amount of light.

It is important to reiterate that the Impression Filter product family works with all 16 Signature Primes and 4 Signature Zoom lenses. That was our plan from the beginning. When you look at the LPL mount on our Signature lenses, there is no lens element protruding inside the camera. With PL mount lenses such as Master Primes and Ultra Primes, especially on the wide angles, the rear element often protrudes well into the camera body toward the image plane.

Keeping the rear element within the confines of the LPL mount was a headache for the optical designers of the Signature lenses. They were not in favor of this idea that the optical element should not protrude beyond the point where the mount ends. However, this concept gave us the chance to create universal rear-mounted filters to influence spherical aberration and other image attributes.

The effect is different from using a front filter. For example, if you use a diffusion or soft effect filter in front of the lens, and there are some very sophisticated soft filters, then they have a global effect over the entire image. It touches everything, and it is not a three-dimensional effect.

A soft effect filter in front makes your image softer. Maybe you have a soft filter with a gradient, a clear spot in the center, or softness in the corners. Such filters exist. You can ask Tiffen to make such a filter. But it has a global effect. To simulate the effect and the look of a different lens, we need to go to the third dimension. We need to influence the bokeh, the background, and also the foreground—separately. Otherwise, it's just filtration.

How are we offering this product to the market? The Impression V Filter Kit comes in an aluminum case. Inside, there are 8 different filters and everything you need to mount them and use them. There's no clear filter because it's not needed. You are probably wondering, if you add a glass element at the rear—and we learned this in film school—does it not change your back focus? No, you don't need to shim at all if you are using the positive diopters to under-correct spherical aberration. Just put the filter on the rear of the lens. You can swap the different strengths of positive filters and you don't need to re-shim your lens. Nothing else is needed.

If you want to over-correct with negative diopters, you need to shim the Signature Prime lens just once. Actually, it's not really a shim, I would call it a metal plate that is 2 mm thick. And then you can swap the 4 different negative filters, and the lens scale should be accurate if you stick to T1.8. But, if you want to use this lens without a diopter, it will not focus to infinity unless you remove the 2 mm metal plate.

You might ask whether you can make your own rear diopters by going to the nearest optician's shop and asking them to mount an eyeglass diopter inside an empty filter ring. Certainly, you can do that, but you would need to shim each lens individually and for each different aperture. It's an eyeglass. It's not an optical element with a complicated optical formula of the base lens, a sophisticated optical design, and choices from more than 190 different kinds of optical glass in the lens catalog.

FDTimes Addendum

• Impression V filters on Signature Primes fit ARRI ALEXA LPL mount cameras, but hit the rear of at least six non-ARRI LPL mounts and adapters that I tried. A Vocas E-mount to LPL adapter was one of the few that cleared. The reason is the increased rear protrusion of the filter and filter holder. New LPL mount and adapter rear clearance specs will be provided by ARRI's service department to those who have an LPL mount agreement with ARRI.

• Tiffen is exhibiting new rear effect filters for Signature Primes at BSC Expo. These filters will be distributed through Tiffen sales channels. More details will follow.

Art Adams on ARRI Impression V Filters

Art Adams, Cinema Lens Specialist at ARRI, tested a set of Impression V filters on two bitterly cold and rainy New York City days. Art discussed his impressions of the Impressions:

From the beginning, we've been using city scapes to evaluate how the Impression V diopter filters work. The good thing about city scapes is you have textures all around the frame, with contrast, building shapes, highlights and dark shadows. All of those are affected by these optics. So it made sense to go to New York and find places where we had lots of lighting contrast, textures of trees against buildings, and seeing how all those textures interacted in three dimensions. It's really stunning what happens.

For most of the tests, I shot with the heaviest diopters—290N (2.9 negative diopter) and 330P (3.3 positive diopter).

We also wanted to test skin tones. On Park Avenue South near Grand Central, the sun was at just the right angle for our model. The light was just the right. Some people like to shoot with soft lenses using hard light because they like the control of hard light, but the soft lens then takes away some of the pain of that hard light. And that's when I went through the entire series just to evaluate how it looked on her skin. *(see page 56.)*

We were shooting with ALEXA Mini LF because you get the most effect from the Impression V filters in Full Frame. We had tested the ALEXA 35 earlier and it works surprisingly well. There's a difference in how it renders the sharpness. It feels like the diopters take effect at lower strengths in Super35 because it is a higher resolution sensor capturing a smaller area.

I rated the ALEXA Mini LF mostly at 80 ISO. Once or twice, I went to 400. For some of the night scenes at the bridges, I went to 1280 with a 288 degree shutter just to get everything I could. We were shooting RAW, but could have shot ProRes. I viewed the EVF with the default ALEXA Mini LF LUT.

Utsi Martin was the colorist in Munich. In his grade, we did a little bit of color tweaking. We discovered that some of the filters are just a little bit on the cool side, but not significantly. And the exposure shift was a quarter stop or less, as best we could tell. It was very easy to just get everything back, and line it up to the reference. The positive ones seemed to get a little brighter, and the negative ones seemed to get a little darker. But, it did not seem to be more than about a quarter of a stop.

The Impression V Diopter Filters are designed, or intended, to be best at T1.8. I shot everything wide open, with the 25mm, 47mm and 75mm Signature Primes at T1.8 and with the full set of Impression V Filters.

At the strongest strengths, with that much spherical aberration, focus becomes a bit arbitrary. The optical designers looked at the medium frequency detail and that's where they lined it up with the focus scale. But the coarse detail and the fine detail focus in different places with this kind of spherical aberration, which is why in these examples, the model's skin looks so beautifully smooth.

It's fascinating to see all the interaction with these filters. You have spherical aberration going one direction, coma going in other directions, and various bokeh effects. The coma interacts with the natural cat's eye bokeh of the lens.

The magnification of the background is also different. If you're on a long lens and the background is very out of focus, you actually lose some of the background characteristics because it's so blurry. But if you focus a bit deeper, so that the background comes a little bit more into focus, the long lenses do amazing things.

There's a balancing act between the filter and the focal length, and how close you are to the subjects and where you're focusing. A lot of DPs talk about happy accidents. I see this being another way of achieving happy accidents because you can get a sense of what these filters will do over time. But it really depends on whether you're on a wide lens and focused at 20 feet or if you're focused at 4 feet. You see very different effects. It's fascinating in that you'll always get something but you don't always quite know what. I think that's the fun of it.

If you are tight on a model on a fashion runway, walking towards camera, and your AC is pulling focus, all kinds of weird things are going to happen in the background as the focus gets closer. There is a very different sense of what's happening. It's almost as if the center and the edges of the frame are doing slightly different things when the focus changes. It's very much a 3-dimensional effect. I've seen that on other lenses with really strong spherical aberration where if you really look, it's almost like the center takes off.

It's almost a different kind of subtle breathing. Signature Primes are very high performance lenses. Because of that, you can put a little piece of glass in the back and start splitting things off of the look. It doesn't take a lot. You're trying to break the image in subtle ways that the original optical designers of the lens would be horrified to learn about. But that's what cinematographers do. It is very interesting.


75mm with 290N

There are some interesting things about this scene. The negative diopter (*above*) brings out background textures, and there's an interplay of overlapping double images and things that happen. When you have that donut bokeh in the background, you have the opposite in the foreground. That actually affects how you view the actors.

Once you use these filters, depth of field charts go out the window. Whenever you have this kind of spherical aberration, you'll have sharper edges behind the point of focus. I'm focused on her eyelashes. We have donut bokeh in the background, and the focus carries more to the background than the foreground. So he's softer than you would expect.

When we go to the positive diopter (*below*), the background is a lot softer. It is interesting how you can adjusts your depth of field. You can bias it in one direction or the other depending on which filter you're using. I'm still focused on her eyes, but he's a lot sharper. Notice, also, how the frame is wider with the positive diopter. These Impression V diopter filters actually change the focal length slightly. I think you could get more of a sensation of depth of field with these filters.


75mm with 330P

Eight ARRI Impression V Filters

All takes were done with a 75mm Signature Prime at T1.8 on an ARRI ALEXA Mini LF. Grading of all scenes on these pages was by Florian (Utsi) Martin, ARRI Senior Colorist. Of course, the effect is more noticeable on a larger screen. These frames will be available online to view on large monitors.

Negative (N) Impression V Filters

050N.

100N.

200N.

290N.

Positive (P) Impression V Filters

070P.

140P.

230P.

330P.

Art Adams on ARRI Impression V Filters

Signature Prime75mm T1.8.
Clean, No filter

Art Adams explains:

When talking about having more of a sensation of depth of field, I saw how the donut bokeh tends to sharpen objects. The donut bokeh will feel sharper whichever side it is on—foreground or background.

The hot center (Christmas ball sytle) bokeh will be on the other side of the point of focus, so that will feel softer.

And because of this effect, it might feel as if there's more depth of field than if one shot without a filter at T1.8—but only in one direction. You can bias the depth of field to be in front or behind the subject.

Signature Prime 75mm T1.8.
290N Impression V Filter.

"Donut" bokeh

Signature Prime 75mm T1.8.
330P Impression V Filter.

"Christmas ball" bokeh.
Widens field of view.
Softer background.

Signature Prime 25mm T1.8 with 290N Impression V. "Arrows" from Coma face inward.

Signature Prime 25mm T1.8 with 330P Impression V. "Arrows" from Coma face outward.

TAT70 Finder

TAT70 Finder

TAT70 is an optical viewfinder that covers Larger Formats beyond ALEXA 65 — up to a 62mm image circle. Of course, it covers smaller formats as well. Any aspect ratio within a 62mm image circle is available.

TAT70 works with one groundglass. Multiple MARMS (Magnetic Aspect Ratio Masks) slide in front of the groundglass to mask the sensor's image area and aspect ratio.

Anamorphic desqueeze modules slide in: 1.3x, 1.5x, 1.8x, 2x.

- Weight: 1.8kg / 4lb
- Dims: L 31.75cm / 12.5" x D 9.5cm / 3.7" x H 17.75cm / 7"
- Optional handgrip plates in zebra wood, walnut, ancient oak, rosewood, composite.
- Mount: Native LPL (accepts 3rd party adapters)
- Zoom Relay: adjustable field of view for S35 to 70mm viewing.
- Eyepiece: 26mm with diopter adjustment. Other focal lengths available upon request.

The TAT70 Directors Viewfinder gets its name from the small production company, Take a Trip Productions, TAT for short, owned by Zak Kapela and Cassandra Diehm in Brooklyn, NY. They did a lot of travel and underwater photography.

Zak got into optical design during the 12 years he worked for Panavision. He worked as on-set film camera technician for productions on the East Coast and was a 65mm technician for *The Hateful Eight*, working with Gregor Tavenner. At Panavision, he got optical training from Dan Sasaki, Guy McVicker, Brian Mills, and Steve Wills. At the Panavision New York office, Zak had several roles, including machinist, to make custom gear for assistants and cinematographers, modify director's finders and lenses, and eventually making and testing custom lenses for cinematographers.

Zak left Panavision in 2019 to become a divemaster and do underwater photography. When the pandemic put a halt to dive traveling, he began designing a director's finder that covered all major formats and had functions that other finders didn't. Zak said, "Years of modifying and expanding coverage of all types of finders was definitely what inspired me to make one that could do it all. Two years later, the TAT70 was the result."

tat70.com

TAT70 Finder with optional HD Video Tap.

MARMS (Magnetic Aspect Ratio Masks) slide in front of the groundglass.

Anamorphic desqueeze modules with 1.3x, 1.5x, 1.8x, 2x ratios.

ZEISS Cine Service Center in Korea

Text by Masako Misaki. Photos by Arato Ogura.

If you have been binging on beautifully photographed Korean movies and series lately, you may have been guessing which lenses were at work. To support one of the most vibrant film industries in the world, ZEISS and Saeki P&C announced the opening of a new ZEISS Authorized Cine Service Center in Seoul, Korea.

This is the fourth facility worldwide that is equipped with genuine ZEISS measurement instruments and test equipment. Lenses brought to the Service Center will undergo the same level of care as if they were at the ZEISS Headquarters' service department.

All members of the service staff at the new facility in Seoul are are fully certified. They have trained at ZEISS HQ in Oberkochen, Germany or in Seoul by ZEISS personnel. The result is that ZEISS cine lens users can benefit from this regional support by avoiding significantly longer shipping to and from Germany along with accompanying customs processes.

Setting up a new full-service repair facility in Seoul was made possible in cooperation with Saeki P&C, the long-time partner of ZEISS in Korea. Saeki P&C has been a major supporter of the Korean film industry. Now, Saeki P&C will be also supporting the industry with proper and prompt lens repairs and maintenance for rental houses and owners. The ZEISS/ Saeki Authorized Cine Service Center accepts any repair or maintenance of ZEISS cinema lenses from all around Asia.

Installed equipment: K-8 MFT tester, K-9 collimator, Co-Axis doreflex, Torque tester, T-stop tester, Lens data calibration device, various tools to open individual lenses. Lenses serviced: ZEISS Supreme Prime, Supreme Prime Radiance, CP.3, CP.3 XD, CZ.2, LWZ.3, CP.2, Master Primes, Ultra Primes.

ZEISS / Saeki Authorized Cine Service Center. Saeki Bldg., 22-12, Supyo-ro, Jung-gu, Seoul, Korea.

CVP BSC Expo 2023

CVP is back on the mezzanine area of BSC Expo 2023 on February 24-25. The latest cameras, lenses, accessories and production equipment will be on display, curated by CVP's technical consultants, product specialists and engineers.

A Virtual Production stage is there to demonstrate a range of applications, budgets and specifications.

The ever-popular, non-alcoholic Lens Bar is back with a more extensive collection of new and vintage glass for evaluation and comparison for combinations of lenses and filters on a variety of cameras.

I assume there will be a real, high-octane liquid Bar opposite the Lens Bar.

The Monitor Wall returns with wide selection of at least 35 monitors all displayed side by side.

Cine cameras from leading manufacturers include Sony VENICE 2 and Rialto 2, ARRI ALEXA 35, REDs V-RAPTOR XL and V-RAPTOR S35. With large sensor / large format cinematography and broadcast colliding, CVP will present fibre channel systems that allow broadcast and studio production to integrate cine cameras and manage multi-camera shoots from one master controller, as well as individual configurations.

CVP's team of ProRepairs engineers will be on site to demonstrate and discuss how to maintain your equipment and to provide advice and tips on keeping your gear running smoothly.

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