Jon Fauer, ASC www.fdtimes.com Mar 2023 Special Report

FILM AND DIGITAL TIMES

Art, Technique and Technology in Motion Picture Production Worldwide

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.

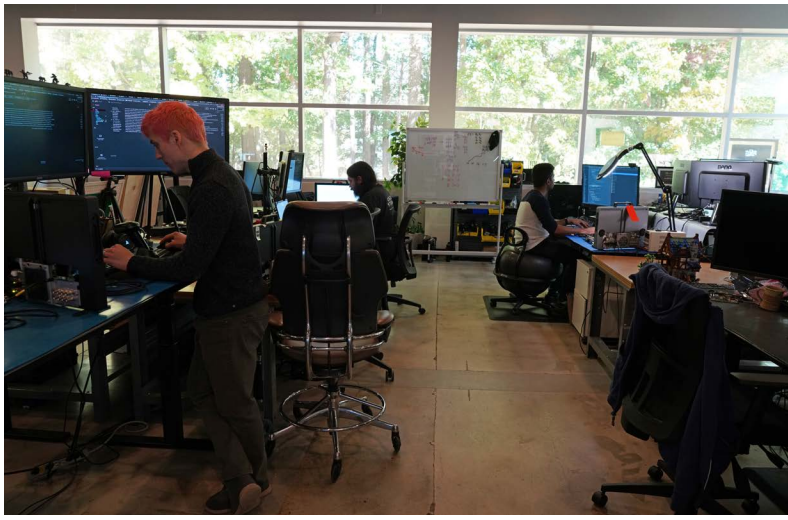
All the design and development is done here in North Carolina. The mechanical engineering team mills aluminum, molds and 3D-prints plastics into prototypes. They work with the Creative Solutions team in Irvine, CA, on industrial design.

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."

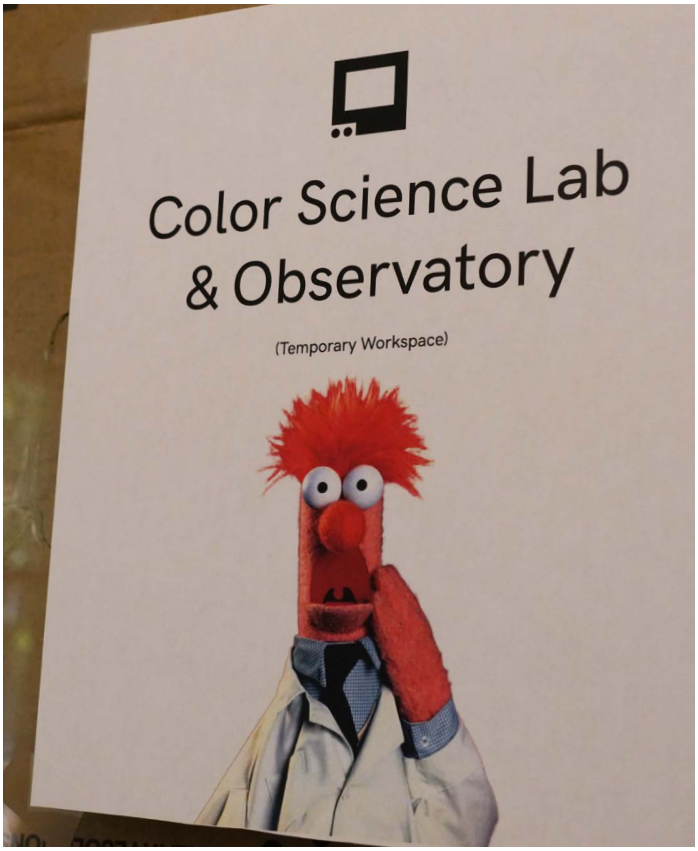
"For example," said Greg, "What is white? There are nearly infinite options for choosing a color temperature for your white point. There is a different standard in Japan than in the US. This is not even new to digital—Fujifilm looks different from Kodak. That has an impact on everything else that you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

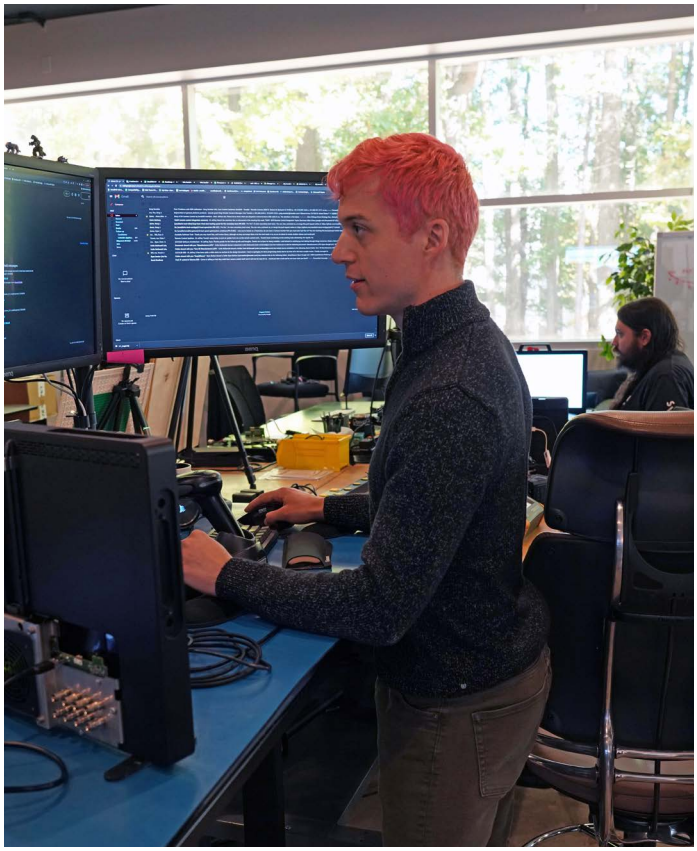
Mike explained, "Observer metamerism is how different people may have different perceptions of the same light source. Different display technologies have different spectral power. The original work on that was done in 1931: the CIE (Commission Internationale de l'éclairage) XYZ color space was a measurement 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!"

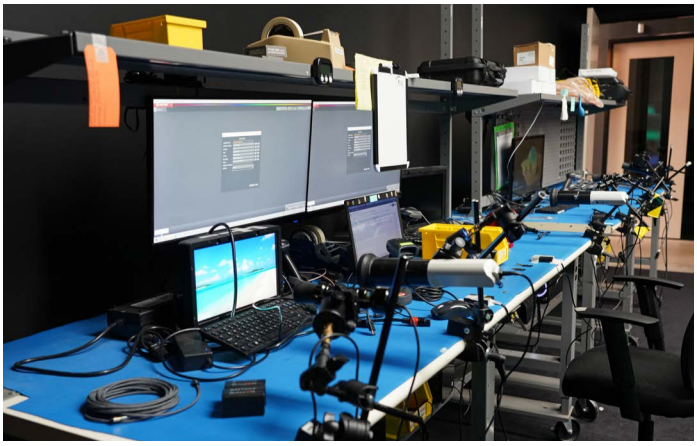
We walk to the assembly area. Teams are putting together everything from 5-inch to 27-inch monitors at various assembly stations. The work stations are flexible to accommodate different sizes, parts, and caliber of product. The number of monitors coming out of this area is impressive.

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.

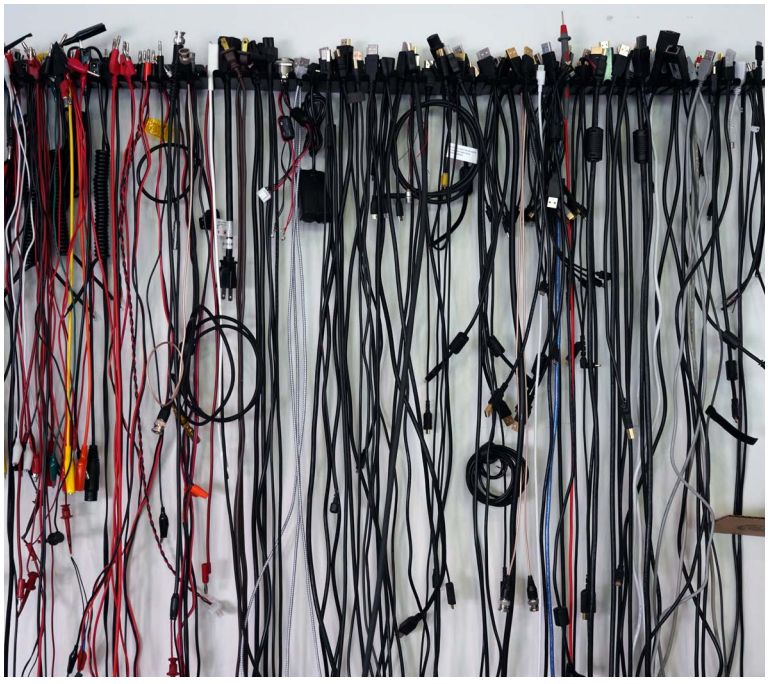


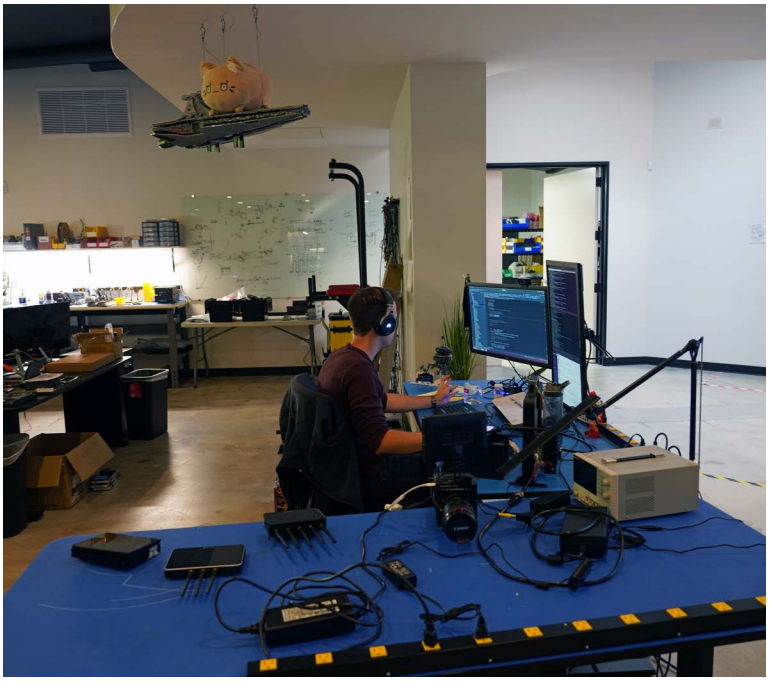


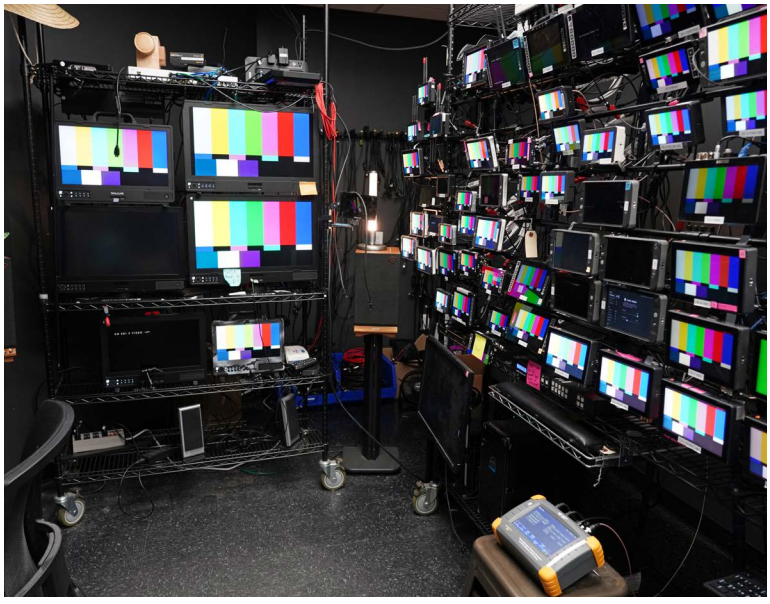
Above: Jeffrey Gray, Software Manager.
Below: (L-R) Mike Claes, Director of Analytics and Color Science, Scott Day, Developer

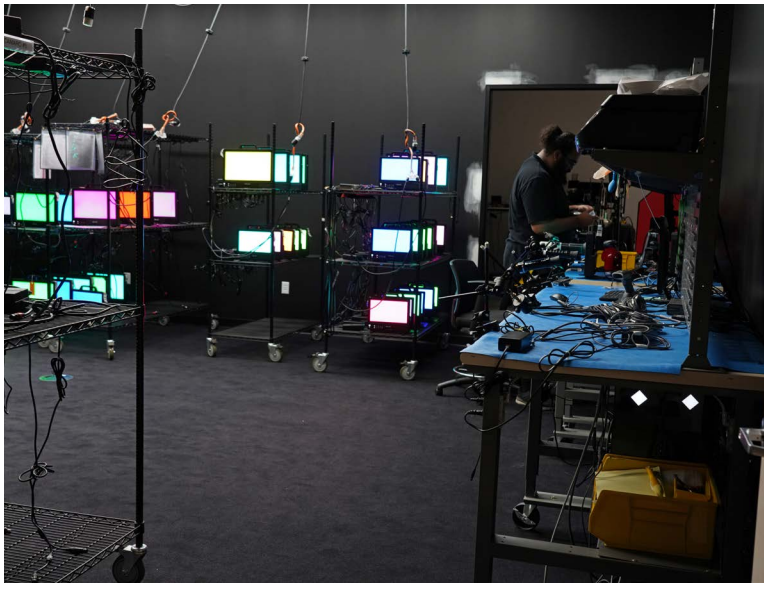


SmallHD Testing



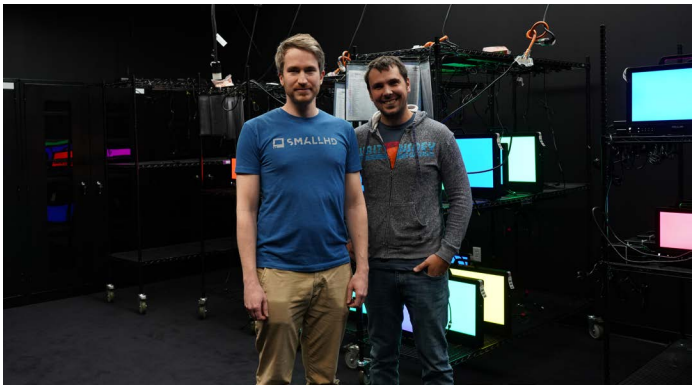




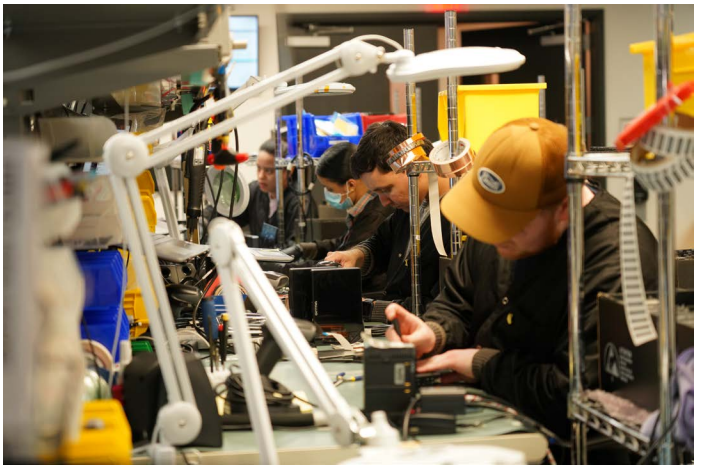


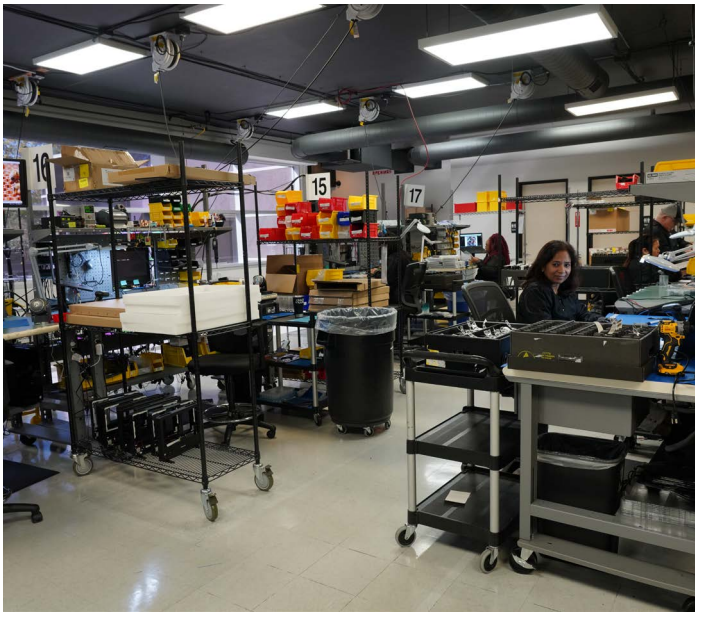
SmallHD User Interface and Development

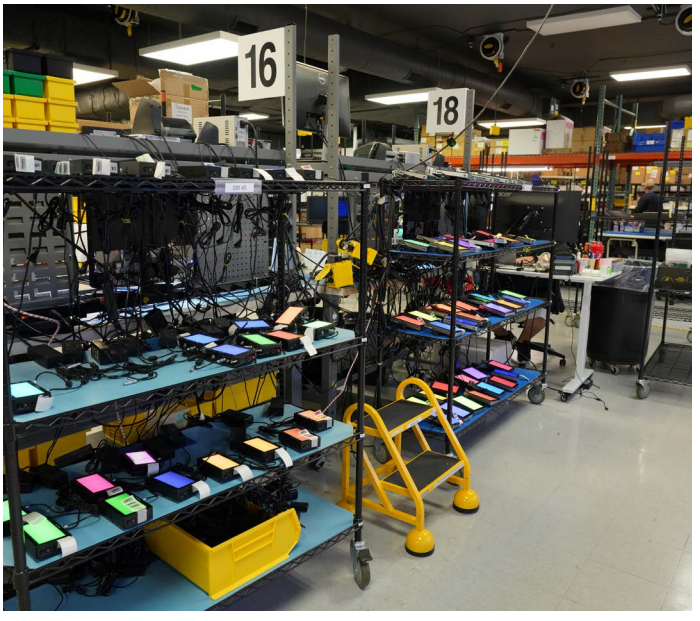
Barrett Phillips (User Interface Designer) above and below left, with Kaleb Droskiewicz (FPGA Engineer) at right.



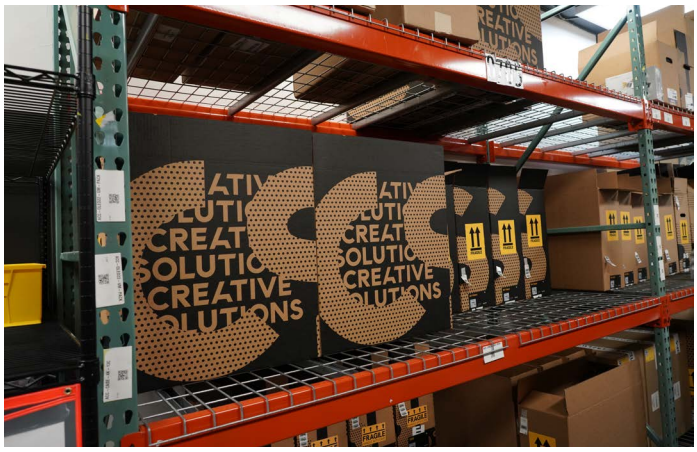
SmallHD Manufacturing





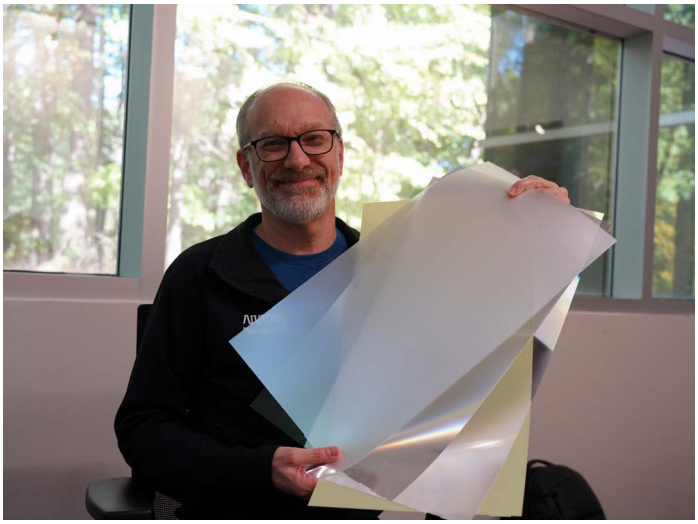


SmallHD Ready to Ship



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?

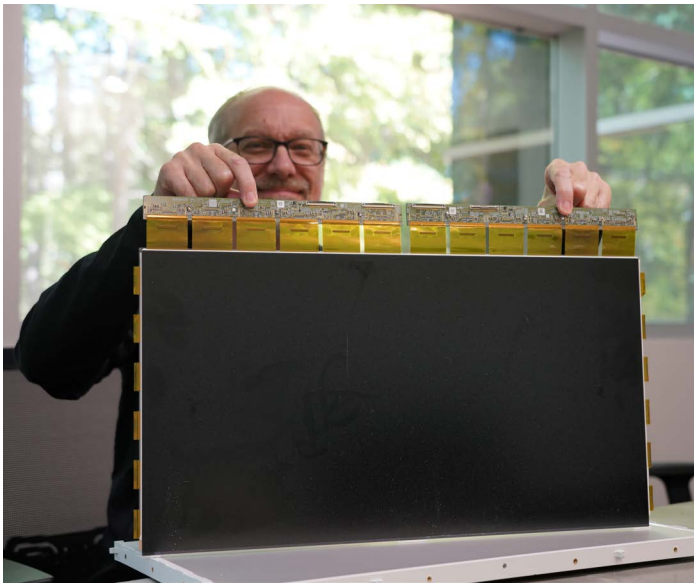
Blake: The Product Management team spends time with the customers and comes to us with ideas. Then I discuss those ideas with our engineering team, including Jeffrey Gray, the brilliant and dedicated software manager, and Russell Hocken, our lead architect. We bat ideas around in terms of ability to 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.

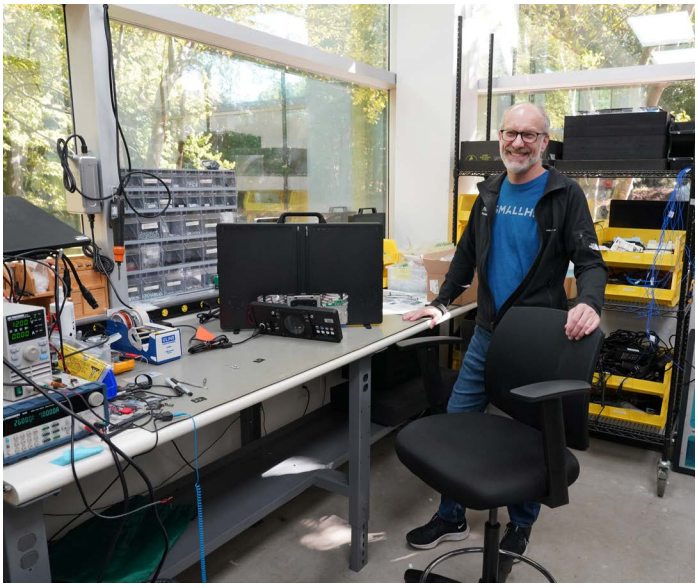
Who are the product managers?

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.

Greg Smokler and Mike Claes

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

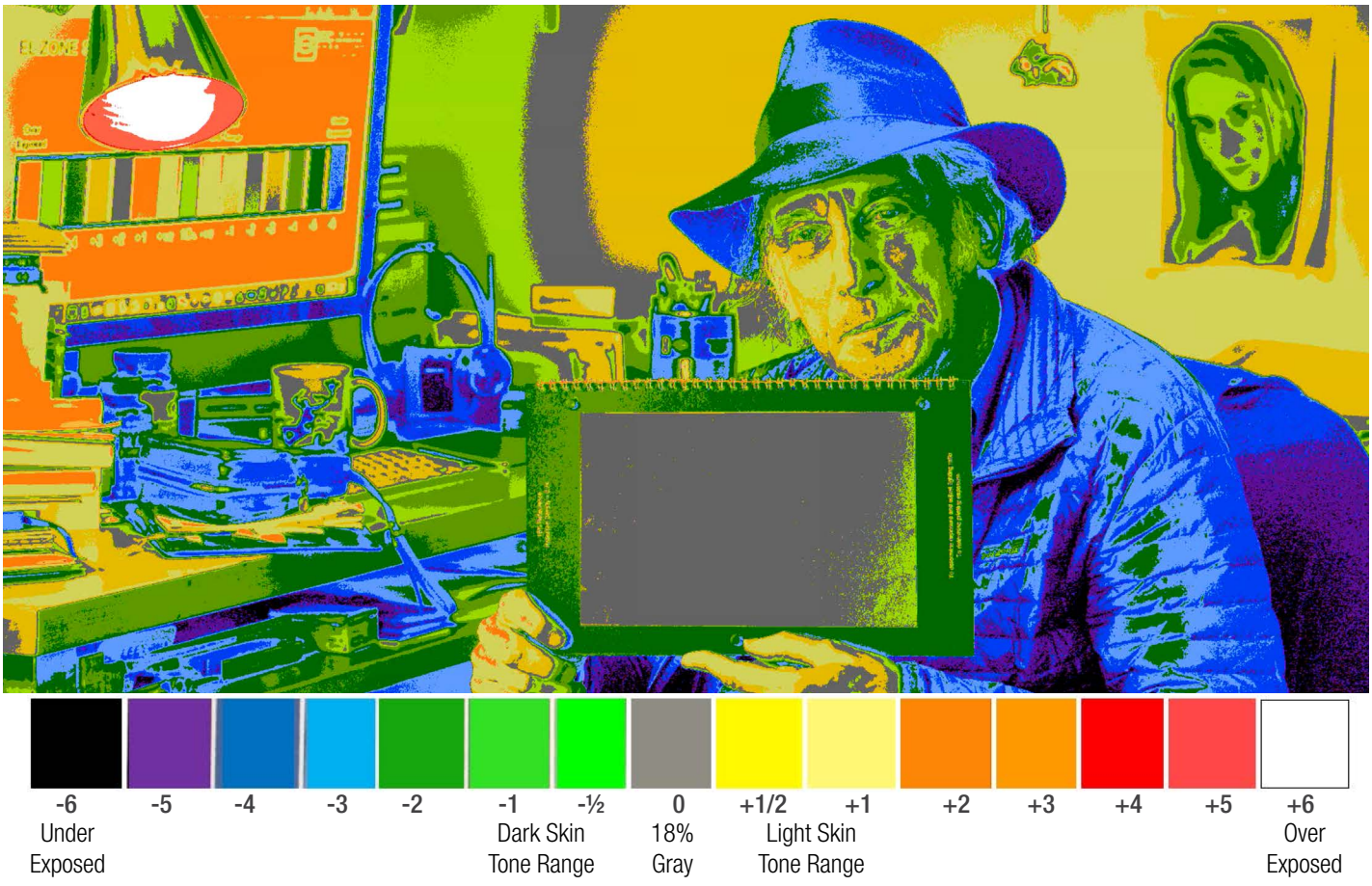
EL Zone on SmallHD Cine 24 Monitor

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.

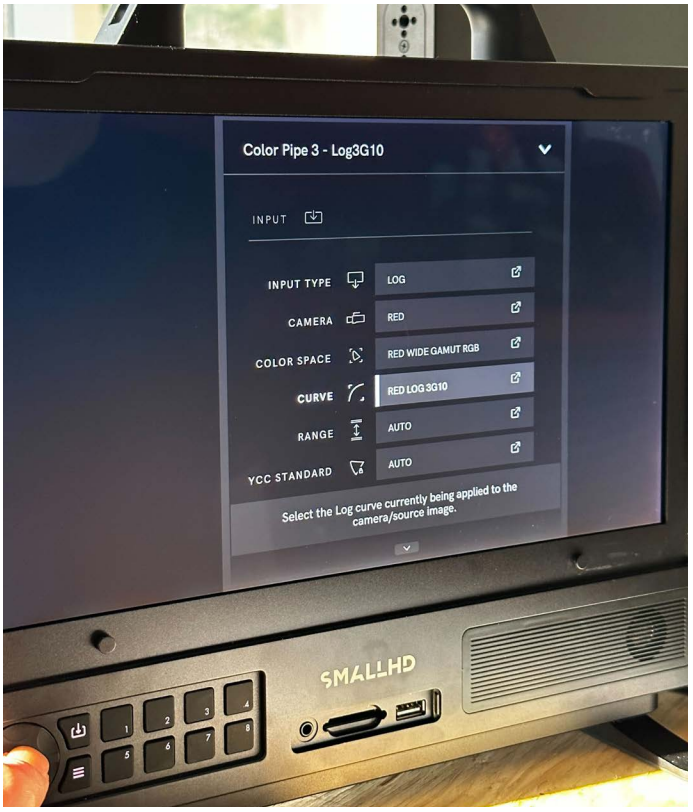
EL Zone is like a spotmeter in your monitor. Each stop of exposure is represented by a color. Areas of the scene over-exposed by 6 or more stops are shown in white. 18% gray is normal-neutral. Black is under-exposed by 6 or more stops.



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.

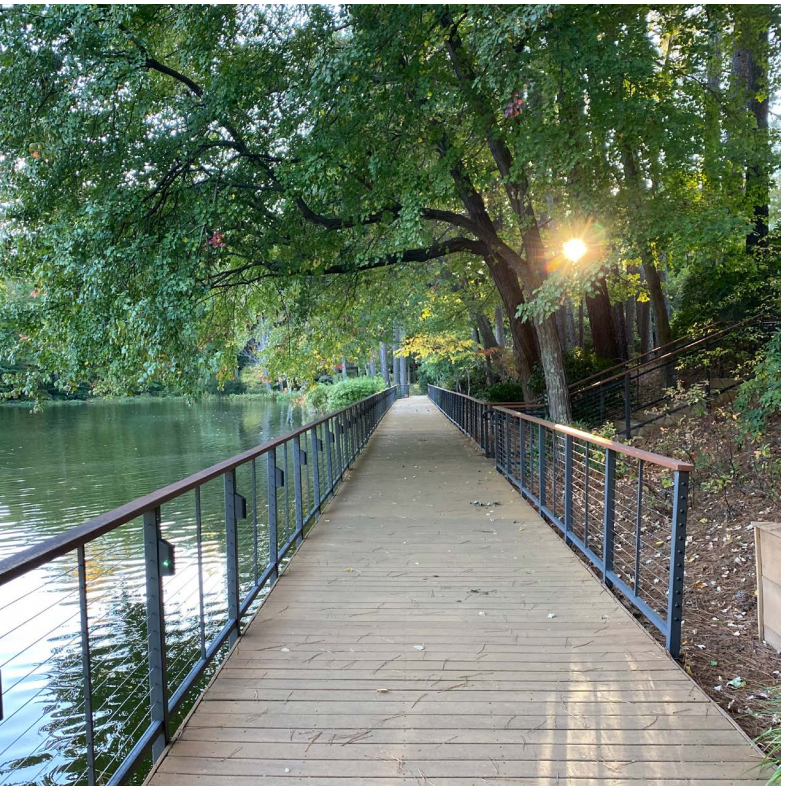
With a swipe of your fingers on the Small-HD touchscreen, you can quickly view:

- 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 Tri-angle 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.

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