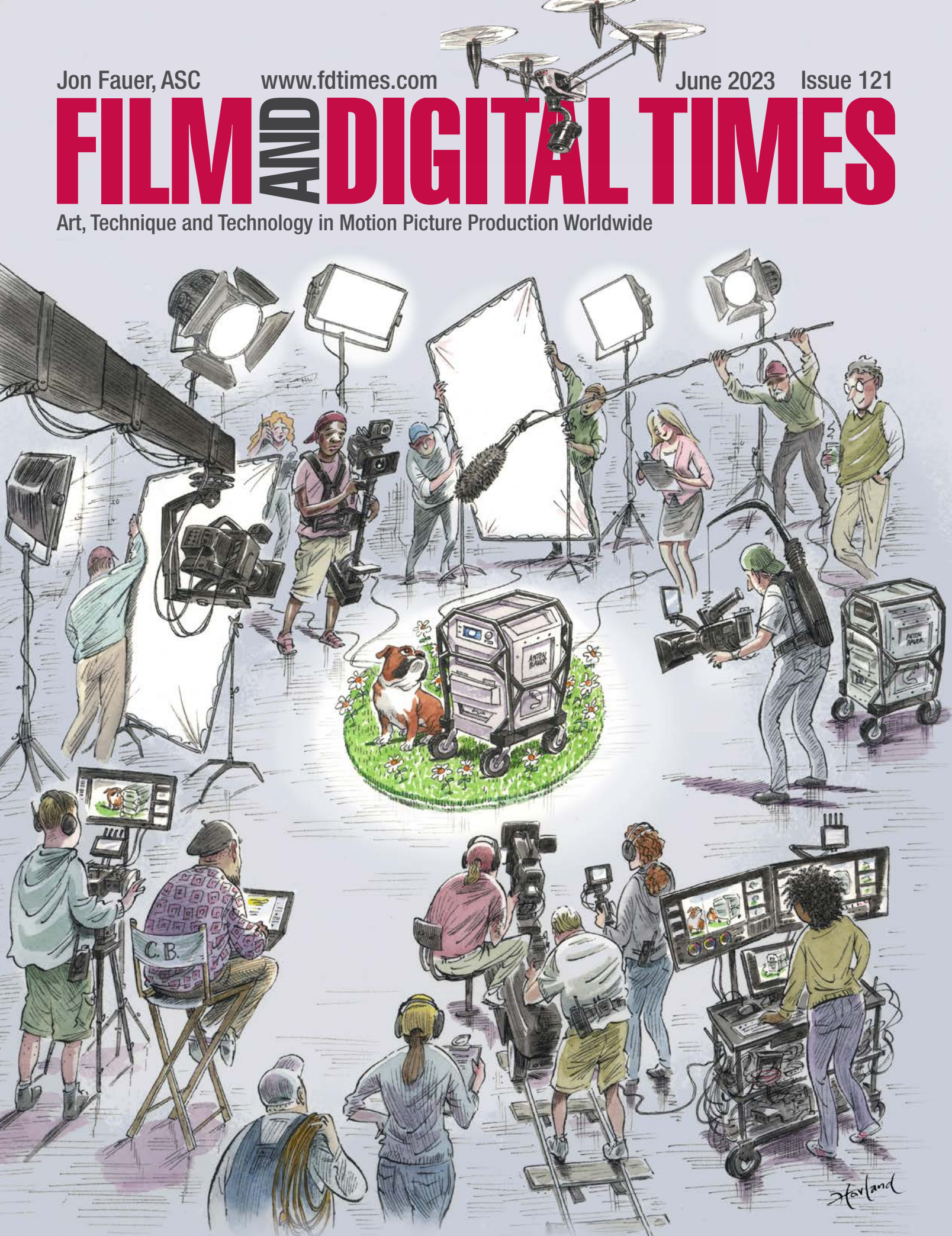
Jon Fauer, ASC www.fdtimes.com June 2023 Issue 121

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 illustration of a sustainable film set and new Anton/Bauer Salt-E Dog battery power system. Illustration by Gary Hovland.

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Salt-E Dog from Anton/Bauer

Front: Salt-E Dog 9 kWh

Rear: Salt-E Dog 9 kWh

It was like a visit with Q the Quartermaster in a Bond film. The door to a small, sparse back room at NAB opened. Playing leading role as Q, Andrew Hutton, Batteries Product Manager at Anton/Bauer, had something to show. NDAs signed, silence sworn, a 4-wheeled object named Salt-E Dog was ceremoniously unveiled, examined, explained. It is to be announced at Cine Gear. Various dog puns were exchanged. "Power of the Dog," "Leader of the Pack," "Round of A-Paws."

The size of a small DIT cart, Salt-E Dog is Anton/Bauer's new sodium battery "generator." Actually, it's not a generator, but member of the new product category called BESS —Battery Electric Storage System. You may have seen some at trade shows or on location. Typically, they are boxes packed with lithium ion, NiMH or Lead-Acid batteries.

What makes the Anton/Bauer Salt-E Dog unique is the use of sodium batteries that are much safer, environmentally friendly and easy to find. After all, 97% of water on earth is salt water and 2.6% of the earth's crust is sodium. Sodium batteries don't blow up or burn. They are comfortably numb even if skewered by a forklift fork. (You may want to find the nearest Hutong bar and order a Comfortably Numb cocktail to calm jittery nerves.) Why haven't we heard much about this new technology? We will.

The initial Salt-E Dog could be called K9. It 9 kWh output may remind you of a typical 9kW (75 amp) "putt-putt" generator/inverter typically used on set to power lights when a big genny is not needed or not yet cabled and ready.

Andrew Hutton explained, "At Anton/Bauer, we try to reduce the environmental impact of our batteries as much as possible. However, we want to go further to encourage all film and TV productions to drastically reduce their carbon emissions and to help them get closer to achieving net-zero carbon production.

"Right now, the majority of all fuel consumption on any production is in the use of production vehicles and generators—and generators are responsible for the largest proportion. With many production vehicles moving to hybrid or electric, the big generator on set remains the biggest culprit."

Most productions currently are powered by big truck-mounted 400 amp to 1200 amp diesel generators connected by lots of long, heavy (2/0 or 4/0) cables to lights, cranes, campers, craft service and everything else that needs electricity on location.

As anyone who lives in a New York highrise knows, the genny in the caravan of production trucks that run all night are noisy (up to 73 db), smelly (diesel fumes) and noxious (22.4 lb of CO_2 and 0.43 lb of NOx for each gallon of diesel burned. And by the way, a gallon of diesel weighs only 7 lb.

So, a 750 amp genny running for 10 hours on location (wildly optimistic short day) at 75% load will burn 40 gallons an hour, 400 gallons in 10 hours and emit 8,000 lb of CO_2. Yikes.

That's the equivalent of driving round-trip from New York City to Anchorage Alaska and back again. (4,339 miles each way, 8,678 mi total, emitting 1 lb of CO_2 per mile.)

Salt-E Dog from Anton/Bauer

Front: Salt-E Dog 9 kWh
7" Color Touchscreen
Control Panel

Salt-E Dog comes to the rescue like a benevolent Saint Bernard or a courageous Bulldog.

It uses new sodium nickel cells. This is a relatively new technology that is rapidly gaining interest. While heavier than lithium-ion batteries, they are safe, easily recyclable and without hidden agendas of availability, transport or environment problems. A large automotive company is already planning to use them in electric vehicles.

As Keith Bradsher wrote in April 12, 2023 NYTimes, "The next big innovation in rechargeable batteries [is] replacing lithium with sodium, a far cheaper and more abundant material. Sodium, found all over the world as part of salt, sells for 1 to 3 percent of the price of lithium and is chemically very similar.

"Recent breakthroughs mean that sodium batteries can now be recharged daily for years, chipping away at a key advantage of lithium batteries. The energy capacity of sodium batteries has also increased. And sodium batteries come with a big advantage: They keep almost all of their charge when temperatures fall far below freezing, something lithium batteries typically do not do.

"Research into using sodium for batteries began in earnest in the 1970s. Unlike lithium batteries, the latest sodium batteries do not require scarce materials like cobalt, a mineral mined mainly in Africa under conditions that have alarmed human rights groups. While salt is abundant, the United States accounts for over 90 percent of the world's readily mined reserves for soda ash, the main industrial source of sodium."

Specifications in brief

Anton/Bauer Salt-E Dog 9 kWh

- Input Connector—for US recharging: 15A IEC 320-C14
  Voltage range: 90-140 VAC
  PowerCon True1 (20A), Solar PV 60V, EV Type 2
- Output power from battery: 120VAC +/- 2% pure sine wave
- Frequency 60Hz +/-0.1%
- 4x AC outputs NEMA 5-20R, 125V, 20A
- 4x XLR3 (3-pin) outputs, each output rated at 48V / 16A
- 4x XLR3 (3-pin) outputs, each rated at 28V / 16A
- 1x Bates Connector - Female Stage Pin 125V / 50A
- USB-A (5V, 2.9A), USB-C (5V, 2.9A)

- Maximum output: 6000W
- Run time at 100% output (6000W): 1.5 hours
- Run time at 75% output (4500W): 2 hours
- Run time at 50% output (3000W): 3 hours
- Run time at 25% output (1500W): 6 hours
- Environment Operating Temp: -10 to +60C
- Working humidity, non-condensing: max 95%
- Display: 7" color touchscreen, shows real-time data, time left to empty, recharge time, etc.
- Dimensions: 75 x 132 x 100 cm, including tires (WxHxD)
  29.5 x 52 x 39.4 inches, including tires (WxHxD)
- Tires: 12" puncture-proof, run-flat tires
- Weight: 300 kg (661 lb)

Specifications and details subject to change.

Andrew Hutton, Product Manager, on Salt-E Dog

Front: Salt-E Dog 9 kWh

Rear

Andrew Hutton is Product Manger - Batteries at Videndum Production Solutions, based in Bury St. Edmunds, England.

Jon Fauer: When did you start thinking about this project?

Andrew Hutton: Within 2.5 months after joining Anton/Bauer, I had an idea for a large portable sustainable power supply solution or BESS (Battery Energy Storage Solution) using a different chemistry than lithium. With more companies having a stronger ESG (environmental, social, governance) focus, and all their stakeholders demanding this, you could see the beginning of the end of fuel generators and with the additional benefits that having these type of units on set brings, faster set up, less cabling, silent power etc it was a no-brainer that this is the route that we should take.

When did you actually begin working on it?

We started carrying out a lot of market research with customers and key stakeholders in the market in January 2022 to ensure that we were bringing the right product out that people wanted and then officially started the project in August 2022.

Please describe the development process?

For myself, and the whole engineering team, it has been a very intensive process but borne out of our passion of this project, as we are doing something new and groundbreaking.

Before doing anything we secured the sodium cell and then, once we had a good amount of feedback from manufacturers, customers, key stakeholders etc that enabled us to start the base design of the unit with the requested feature set, then it was a continuous refining of the product with all the before mentioned parties. Then the final big push at the end, as it is always the last 10% of a project that takes the most time as you tweak a little here and there.

Why have most people not heard about sodium batteries?

There are a few reasons why sodium, until recently, garnered no attention.

To cut a long story short, it all started back in the 1980s when lithium was chosen as the chemistry to really invest in as it showed far higher energy density potential to existing chemistries of the time and there were technological breakthroughs in cathode and anode materials, separators film, and electrolytes, all of which has been overcome in sodium now. By the 1990s lithium Ion became the chosen chemical mix and customer acceptance was key to this.

At the same time research in sodium was still moving forward but not with the same resources or focus as lithium, this all started to change within the last 6 to 8 years as the properties of lithium and sodium are very similar but with some large differences the main ones being the safety and ethical aspects of sodium.

From a safety point of view sodium is streets ahead as there is no chance of thermal runaway, fire or explosion. Other unique advantages are they can be discharged to zero volts, they have a far wider operating temperature range and power retention rate in these extreme temperatures.

From an ethical standpoint sodium is one of the most abundant elements on Earth which every country has access to and it can even be removed from sea water, whereas the mining of lithium and cobalt are wrought with numerous environmental and human rights issues, which no likes to talk about but as the leading battery manufacturer for the industry for over 50 years it is only right that we hold our hands up to these issues, which all seem to be ignoring while pushing more lithium products out into the market, and try to show a new way forward using far more sustainable, greener solutions.

I came into this industry from a pure power and batteries background and I have known about the rapid progress in sodium

Andrew Hutton, Product Manager, on Salt-E Dog

Top front ¾ view

Side view

for many years now, this will only continue as the world looks to have a far more sustainable, safer greener future which sodium is key to.

Why are they not used in cars (except a big car company in China) and other things?

Until quite recently the power density of sodium was it's disadvantage, however they are rapidly catching up with lithium solutions and I know of many car manufacturers who are testing these already. As you state, there is already one very large and rapidly growing manufacturer who has turned to sodium.

But they will, right?

Yes, in the next 5 years we will see sodium batteries becoming common place, and in many industries/markets the preferred power solution.

How / when did you come up with the name Salt E-Dog?

Early last year I showed my idea to a colleague, Steve Turner Product Manager of OConnor, and he said "it should be called the Salt-E Dog, as it states what it is made from, it is quiet, portable and the crews always come up with nicknames for products and that would be it." After pitching this name, and others, the feedback on the name was universally positive as it was fun and unique—plus "dogs" are loyal and reliable.

What is your vision of the future (now and 5 years from now) on movie sets with sodium batteries?

This is our first model of the Salt-E Dog series and we have plenty of others on our roadmap. I think in 5 years there will be Salt-E Dogs of varying capacities, output power ranges all running silently on motion picture productions, in OB vans and powering everything from audio, lights, cameras, craft, talent, etc.

Will diesel generators be totally gone from film sets?

In time yes, but it will take time, education, trust and confidence in this new approach to powering a set to take root.

The Salt-E Dog 9kWh is aimed at removing the smaller and numerous putt putt generators from set and get the crews use to using them. We also envisage it allow crews to use alongside existing fuel generators but instead of using a 100KVA generator a production could use a 60KVA or 40KVA and the Salt-E Dogs.

At the moment most fuel generators are heavily under-utilized with research showing 80% of the time a fuel generator is running it is only using 20% of it's capacity, there is so much inefficiencies, wasted energy, CO_2 and NOx being produced working this way, so this small step change will have a big change on emissions produced.

We have to understand that fuel generators have been around for a very long time and a change in work flow is needed to be addressed as you can't just put more power into a battery like you can fuel into a generator, so knowing how many lights are needed for how long, what that means in power consumption needs to worked into the workflow. This is already happening though with many crews wanting to try the new products and approaches.

A few gaffers asked how to power 18K HMI lighting fixtures on set. Comment?

As we bring out larger capacity units with larger power outputs this will be possible. While we could go very, very large on capacity and power output now, we think it is prudent to take a more holistic approach to powering sets, lights and equipment, and work with the crews to ensure that we capture and address all their pain points.

What else?

We have designed the unit to work in all weather, as it will be IP55 rated. This is higher than most fuel generators and other "solutions" out on the market.

Salt-E Dog Sodium BESS "E-Generator" vs Diesel Generator

Salt-E Dog Sodium BESS "E-Generator"

Portable, Fast, Silent, Simple.

- Portable - Compact and maneuverable.
- Rapid set-up and powering of equipment
- Silent - Can be placed in close proximity to equipment
- Use in city centers without restrictions or expensive licenses.
- Simple operation – No extended cabling or breakout boxes.

Sodium-based battery power source is the greenest portable energy storage device on the market.

- Zero impact battery: 100% recyclable. No rare earth materials.
- Safety – Intrinsically safe. Electrochemical safety. No reaction to fire or water.
- Sodium nickel technology is completely non-flammable and nonexplosive vs. fuel and lithium-ion.
- Life cycle and cycling capability: >4500 cycles (80% Depth of Discharge). The unit can be re-celled.
- Reliability – Proven technology which has been used in a variety of markets for over 50 years ranging from military, automotive, energy storage and more.

Zero CO2 and NOX emissions

- Near silent with no air pollution
- Can be placed next to equipment, removing a lot of cabling.
- Pure sine wave output ensures high quality power is produced
- Very cost effective against fuel generators. Simple to use.
- Can be set up on location in under 30 minutes.
- Operates at any load at a far higher efficiency
- No active maintenance is required.

Sodium battery "E-Generator" 9 kWh with 4500 W per hour output and 18kWh with 6000W per hour output

- Zero CO2 emissions. Offsets 47.27 kg of CO2 for every 8 hours of operation. Saves 59,020 kg over 5 years, and 118,040 kg over 10 years.
- Zero NOx emissions. Saves 1,112.3 kg over 5 years, and 2,224.6 kg over 10 years.
- 9 kWh Salt-E Dog: Electricity recharge cost a year at $0.1990 per kWh = $510.00
- Saves $7,071.80 a year, $35,359.00 over 5 years, and $70,718.00 over 10 years.
- 9 kWh Approximate up-front cost: $47,200
- 5-year standard warranty.
- Weight 9 kWh: 300 kg (661 lb)
- Motorized options might be under consideration.

Specifications and details subject to change.

Diesel or Gas Generator

Diesel use cannot continue, and current alternative technologies have significant environmental limitations.

- Diesel – The mainstay of generator power for many years but cannot continue if environmental targets are to be reached.
- Bio-fuel – A new go-to option to use in traditional generators, but it has many drawbacks.
- Hydrogen – The most abundant element, and if utilized properly has the largest potential to have a net positive impact on the environment—but a truly green solution could still be greater than 10 years away.
- Lithium – The current "king" of green power but with many hidden environmental issues.

High CO2 and NOx emissions produced.

- Sound and Air pollutant
- Very long cable runs due to noise
- Quality of power produced can cause issues
- Requires dedicated generator and often a fuel truck.
- Increasingly higher operational costs
- Long set up time involving large team
- Operates best at 50-75% load
- Requires regular maintenance every month and servicing every 250-1000 hours.

Small 12kW Diesel Generator

- CO2 emissions produced a year = 11,804 kg (26,023 lb)
- NOx emissions produced a year = 222.46 kg (490 lb)
- Diesel used a year = 4540 liters (1199 gallons)
- Diesel cost a year at $1.67/l = $7581.80

(* Estimates based on fuel generator running at 1/2 load, 8 hours per day, 5 days per week, 50 weeks per year)
Up-front cost to purchase $3,000 - $13,000.

Top and bottom, left: prototype Salt-E Dog. Right: typical small generator.

by Nicola Dal Toso, Divisional CEO, Videndum Production Solutions.

The motion picture and television industries play a crucial role in inspiring audiences and driving change. We are excited to be part of an industry that is working towards sustainability goals and that we can assist by producing a cleaner, more environmentally safe alternative to traditional power sources. The Salt-E Dog is the first of a new breed of sustainable Anton/Bauer products that will provide consistent, reliable power with no noise or pollution, helping productions meet sustainability goals without compromising quality.

Anton/Bauer's commitment to innovation, recognized by award-winning achievements, now extends to sustainability. The time has come for the industry to embrace clean technologies, promoting both human health and the well-being of our planet. Our research and development process is focussed on reducing carbon emissions and minimizing the environmental impact of power solutions for film and television production.

by Pat Grosswendt, Gaffer, Co-Founder of Litepanels

Pat Grosswendt's credits as Gaffer include Gosford Park, The Crucible, Monkeybone...

The majority of us in the world are concerned about climate change and surviving. And so, I think the Salt-E Dog is brilliant. I think rental houses are the main clients who will accept it out of the gate. Some of them have already tried prototypes or have been prepped on it. But the fact of the matter is, everybody's going to want it when they find out about it.

Let's say you're a wildlife cinematographer who does time lapse out in the field. You drop a little miniature one of these down. You don't worry if it gets stomped on and crushed by a rhino, because it's not lithium and there's nothing environmentally wrong with it, and it'll last for weeks or months, grabbing shots with a motion sensor. I can see really great value for it traveling, being shipped, allowed on airplanes because it's not Lithium. Imagine a truckload of those showing up on location, and just running the whole set, because you wheel them off, and wheel them on.

Does this replace the individual putt-putts, or does it replace the whole big genny? If the price is right, and the conditions are right. California regulations will require that RVs cannot be sold with gasoline generators. Look at all the campers out there. If you're buying a new one, everybody's going to go to batteries. Being able to set up the battery, or a number of them, is going to be good. I think it's going to be like a box of bolts. Everybody's going to have a different idea how to use it.

The bigger generators you're familiar with on trailers are 1,200 to 1,400 amps. Those generators, back when gaffer/business partner Rudy Pohlert and I were going to buy some and have them on our jobs, cost about $40,000 to $70,000. Plus you've got to have all your permits, and then your license, trailer license, insurance, and more. I think this is going to be very practical, and I would expect that somebody find's a way of incorporating them on a trailer and just dropping them off on jobs.

by Mike Bauman, Gaffer, DP, Co-Founder of Lux Lighting and LiteGear

Mike Bauman is a Gaffer and DP. Credits include Licorice Pizza, Iron Man, The Master, Ford v Ferrari, The Tragedy of Macbeth, *and* Phantom Thread.

Just as LED lighting has become gotten more refined, it's certainly helped for really utilizing these new kind of battery-powered energy systems.

California has restrictions on diesel generators, but so far, New York does not. Unfortunately, people put bio-fuel labels on them and even import diesel generators from elsewhere.

I think the incentive is the fact that these systems allow you to speed up your day. For example, we could be lighting a night scene. Instead of a big generator and running long heavy cables to a light three blocks away, I can say, "Hey, I need a light down there. Just put a battery right there next to the fixture."

It also saves time because you don't have to hide those long 2/0 cables that might be in the shot, stretching down the street. You also save a couple of hours it takes to lay 300 to 400 feet of cable from the genny to the light fixture.

Or, you shooting a location interior; you can hide the battery behind a piece of furniture. It's interesting. The economies of scale are starting to come into play and there's a scaling component that is helping as well.

These economies of scale are also appearing in the LED fixtures themselves. For example, I haven't yet seen an LED equivalent of an 18K HMI. That's like the Holy Grail of everything everybody wants. If you're going to compete against the sun, you're still going to be using 18Ks and M90s and those kinds of fixtures. You definitely can get some multi-PAR banks, and they're getting brighter. We saw some at NAB.

But, it helps that cameras are more sensitive. Instead of an 18K lighting the street at night, 4Ks can be a viable replacement. Depending on the scene, I'd have a couple of S360 SkyPanels for soft source and hang a couple of moving lights underneath, which you could focus up as hard sources.

We usually use SOLAHYBEAM 3000 fixtures or something like that. They are very bright 750W LEDs that you an pan, tilt, focus remotely. They have an iris like a Source4, so you can take light off of certain things really easily. You can put gobos in there to break it up. You can do color changes on it. And fade it out if you're doing cues, that kind of thing.

That entire rig can be run off one of those battery stations that you could park at the bottom of the Condor bucket crane. The other nice thing is when you're in New York neighborhoods, you don't have a generator belching smoke out into everyone's windows.

Sometimes people get really upset about that, especially if the generator is making noise and keeping them awake all night. But if it's just a quiet battery thing, that's just not making any noise, and not making any smoke, that is very good. I've had times when people from the neighborhood come and just shut the noisy, smoky generator off. We're four blocks away and all of a sudden, "Why did the condor go down?" Some neighbor got mad and just shut it off.

Salt-E Dog Output Panel

Salt-E Dog Input (Charging) Panel

David Pasko is Engineering Manager at Videndum Productions Solutions. He has been at Anton/Bauer in Shelton, CT since 2013.

Jon Fauer: Tell us about the background of this project from your perspective.

David Pasko: Anton/Bauer has always been researching new technologies, whether it's electronics, mechanical features, battery cells, battery technologies. This particular project and the chemistry of sodium based batteries has been very interesting.

What kind of plugs and connectors does Salt-E Dog use?

There are several options. There are four 120 V AC 20 Amp Edison plugs on the front panel, along with four 48V DC 16A and four 28V 16A 3-pin XLR connectors, and one Female Stage Pin 125V / 50A Bates Connector. These DC connectors are for LitePanels, Geminis, Astras, SkyPanels and other LED fixtures—for the option of plugging in directly without their AC to DC power supplies.

Why not use the AC Power Supplies with LED fixtures?

One of the reasons is to simplify things. For example, we know that some people complain about the weight of some LED big brick power supplies that they have to carry. We thought if you just plug in directly that simplifies things. And, you get longer run times because you don't have to be converting AC to DC. We try to make it as flexible as possible, both input and output.

Input—tell us how you feed....er...charge Salt-E Dog.

There are 4 possible different connections for charging.

- There's a 3-pin 15 amp AC input connector.
- There's a power-con 20 amp connector.
- There's a standard connector for panels. So you can connect solar panels directly to the unit and charge it.

And there's an electric vehicle Type 2 charger input. So you can take this to car charger stations, which, if you think of the concept of putting a number of these on a truck and bringing them to car EV chargers. So that's another option, just trying to provide flexibility. People can use it in a lot of different ways.

How quickly will it charge up on an electric EV station and with solar panels?

Charge time from an EV station type 2 is about 11 hours for a full charge. But charge times are not linear in general; the charge is much faster at the beginning and tapers off. For example, from 0 to 20% is about 1 hour 11 min. 0 to 40% is 2 hours 31 min. 0 to 60% is 4 hours 11 minutes. And 0 to 80% is 6 hours 16 min.

Salt-E Dog is Sodium Nickel. What about Sodium Ion?

The sodium nickel in the battery that we have actually has an internal heater that is part of the charge cycle. When you begin to charge the unit, the salt is actually melted at 245°C / 473°F into an electrolyte that allows the passing of the ions. It's encapsulated and heavily insulated.

The benefit is when you fully charge it and let it cool down so that it hardened, it'll actually won't lose capacity for 20 years. That's why like the energy storage, power backup and off-grid people loved it, because it'll never degrade. It has to be warmed up to extract the energy, but then it's safely stored away.

Why are we not using sodium ion? It sounds simpler.

It's not commercially available in mass quantity yet. It's very expensive. At this point right now, it's kind of in chemistry labs.

How do you keep the battery from getting too hot when it's charging?

It's heavily insulated. Inside the Salt-E Dog unit, there's a compartment where the battery sits. Even when it's at full temperature, you can reach in and touch any surface area of the battery and it'll just feel warm to the touch. There are no hot points.

Why is sodium nickel safer than a lithium ion battery?

One of the main problems with lithium ion is the flammable electrolyte. If there is an errant condition, or overheating, or a flame-out, the lithium will burn.

Sodium doesn't have that reaction. Sodium is the type of technology where you can drive a steel rod through it and it doesn't negatively react. And, that's one of the things we're trying to show here: all these other lithium-based systems that are on the market are dangerous goods. Transportation of sodium nickel becomes much easier.

AbelCine and Lux Lighting

Rich and Pete Abel in Industry City.

Mike Bauman on set.

In April 2023, AbelCine and Lux Lighting announced a strategic sales and integration partnership to expand their reach in film, television, and broadcast markets to the full range of customers—from freelance gaffers and cinematographers to studios, schools and institutions.

Lux Lighting was co-founded in 1998 by renowned gaffer and DP Mike Bauman. He opened a New York office in February 2020 in Industry City, which is where AbelCine had moved in 2017.

AbelCine was founded by Pete and Rich Abel in 1989. Today, AbelCine has offices in Industry City, NY; Burbank, CA and Chicago. Sales include most of the major product lines: ARRI, Canon, RED, Sony, Cooke, ZEISS, etc. The Industry City facility is active in Integration, Rental, Engineering, Solutions Development and Training.

To tell us more, Pete Abel and Mike Bauman graciously endured some questioning.

Jon: How did this co-production between Lux Lighting and AbelCine begin?

Pete: It started because we're both on the Industry City campus where we saw all this potential of connecting with other service providers, clients and freelancers.

Mike: From an outsider perspective, and I'm clearly coming from a position of not having being soaked in the New York film scene, but to be able to come into a space that was relatively easy to get into, with so many other vendors here, really was a multiplier. It goes along with everything that's changing in lighting.

What does your strategic partnership involve?

Pete: Both companies, Lux and Abel, focus on a number of services. Both companies have experienced generations of technology. We both have thriving rental departments and very busy service sides of the business. And Abel has been in the sales part of the business almost as long as we've been around.

As Mike and Lux arrived in Brooklyn, we spent a lot of time together. The journey and the evolution of Lux was the natural next progression to consultative lighting sales. And so, when Lux started to get into the sales side of lighting, we were becoming closer as colleagues—and then the discussions started to happen.

Mike: We had been providing sales on the West Coast on a very limited basis, mostly just to owner/operators, primarily ARRI, a few other brands, and just let it evolve. As more LED technology started to creep in, Lux as a rental house and myself as a gaffer were already working with a lot of those technologies. We just naturally fell into a position where we could offer perspective and education rather than just data points.

Then we thought, how do we increase the sales experience? We saw that there really isn't a better partner than Abel— because we know their team and their phenomenal infrastructure, because it just makes the experience much better for the customer. This, in turn, gives us the freedom to expand in areas such as repair and make it more of a holistic experience across the board.

Pete: You can see the similarities in addition to the ethos and the culture of the companies. We've come from a core knowledge of camera and optics, the needs of the cinematographer. But, as technology evolves, creating the image has become so much about all of it: camera, optics, lighting, and their interconnectivity.

As we evolved and our sales model grew from consulting and supplying owner/operators, freelancers and production companies, we found ourselves servicing larger corporate entities who were coming to us for a cinematic approach and high production value tools that didn't stop at the camera and lens. More of our integration projects were bringing us into and requiring us to provide creative lighting consultation and systems. And so it seemed like such a natural next step for both of us.

Canon Flex Zooms

CN-E14-35mm T1.7 - S35

CN-E31.5-95mm T1.7 - S35

Super35

RL-F1 Relay Lens Unit
converts 14-35 T1.7 S35
to 20-50 T2.4 FF

RL-F2 Relay Lens Unit
converts 31.5-95 S35 to
45-135 T2.4 FF

CN-E 20-50mm T2.4 - FF

CN-E PL45-135mm T2.4 - FF

Full Frame

RL-S1 Relay Lens Unit
converts 20-50 T2.4 FF to
14-35 T1.7 S35

RL-S2 Relay Lens Unit
converts 45-135 T2.4 FF to
31.5-95 T1.7 S35

There are four Canon Flex Zooms. Two are Full Frame:

- CN-E20-50mm T2.4 L F/FP (20-50 T2.4 FF)
- CN-E45-135mm T2.4 L F/FP (45-135 T2.4 FF)

and two are Super35 format:

- CN-E14-35mm T1.7 L S/SP (14-35 T1.7 S35)
- CN-E31.5-95mm T1.7 L S/SP. (31.5-95 T1.7 S35)

The designation "Flex" in the name suggests a very flexible option if you are shooting in both FF and S35, and dreamed of using one set of zoom lenses for both formats. Think of it as one "neutral" lens body with two different rear optical groups, called "Relay Units," that cover Full Frame or Super35 formats. You can easily convert a Super35 Flex zoom to Full Frame—and a Full Frame Flex zoom to Super35—with a Relay Lens Kit.

For example, you are currently shooting with Super35 cameras. Last year you bought Full Frame Flex Zooms. Now, for about $4,999, you can buy a Relay Kit (works like a Reducer), get wider angles and gain about a stop.

Or, you are shooting with a Super35 camera but don't own lenses. Buy the new Canon 14-35 and 31.5-95 T1.7 S35 Flex Zooms, confident in the knowledge that when you land your next Full Frame job, you can get a Relay Kit to cover Full Frame with the same lenses converted to 20-50 and 45-135.

Canon Flex Zooms do not use shims. When you change formats, an adjustment screw sits under a rubber flap at the rear to adjust flange focal depth. Flex Zooms are available in interchangeable EF and PL mounts. You do not have to send the lenses to a service facility if you want to do it yourself—in a dust-free environment.

The Super35 14-35 T1.7 Flex Zoom with PL mount is 9.2" / 233.3 mm long and weighs 7.7 lb / 3.4 kg. The 31.5-95 T1.7 with PL mount is 9.4" / 238.4 mm long and weighs 7.8 lb / 3.5 kg.

All Flex Zooms have similar dimensions, weights and 11 iris blades. Focus barrel rotation is 300 degrees.

Canon Full Frame Flex Zooms and Relay Kits are here now. Super35 format CN-E14-35mm T1.7 L S/SP and CN-E31.5-95mm T1.7 L S/SP are scheduled to be available in late June 2023 and late October 2023, respectively, for an estimated retail price of $21,999.00.

Canon RL-S1 and RL-F1 and Canon RL-S2 and RL-F2 Relay Kits are scheduled for late June 2023 and late October 2023, respectively, for about $4,999.00. *usa.canon.com*

Canon Flex Zooms: Quick Change between Full Frame and Super35

1. Four Canon Flex Zooms. From left to right: 14-35mm T1.7 Super35. 31.5-95mm T1.7 Super35. 20-50mm T2.4 Full Frame. 45-135mm T2.4 Full Frame. *Shown from camera right side.*

2. You can easily convert a Super35 Flex Zoom to Full Frame—and a Full Frame Flex Zoom to Super35—with a Relay Kit from Canon. It consists of, left to right: Relay Lens Container, Relay Lens Unit, Front Ring with ID showing zoom range, Zoom Gear Ring, Iris Gear Ring, Rear Cover (red) with ID showing lens details.

- RL-F1 and F2 convert S35 to FF. RL-S1 and S2 convert FF to S35.
- Relay kits are not specific to lens serial numbers. They are interchangeable—as long as you abide by FF or S35 and Focal Lengths.

3. These are the tools you need: Small Phillips, 0.9mm hex, 2mm hex, and 1.5mm hex. It takes about 10 minutes to switch between formats.

S35 → FF

4. Let's begin—in a dust-free environment.

We'll convert a Super35 31.5-95 to a Full Frame 45-135.

Unscrew 4x Phillips screws and remove the Rear Red Cover.

5. Loosen (but do not remove) 4x 0.9mm hex screws that adjust optical axis centering.

6. Unscrew 8x 2mm hex screws that secure the Lens Mount.

7. Remove the Lens Mount —PL (shown here) or EF Mount.

Rear view, EF Mount

Inside view, EF Mount

8. Canon Flex Zooms let you quickly swap between PL Mount and EF Mount. Electronic metadata pass-through is enabled for Canon EF contacts and /i - eXtended Data.

Canon Flex Zooms: Quick Change between Full Frame and Super35

9. Remove 6x 1.5mm hex screws holding the S35 Relay Lens Unit.

10. Remove the S35 Relay Lens Unit (Rear Group).

11. Out with the old (S35 Relay Unit at left). In with the new (Full Frame Relay Unit) at right.

12. Secure FF Relay Lens Unit with 6x 1.5mm hex screws

13. Replace the lens mount with 8x 2mm hex screws.

Be sure to check the optical axis (zoom tracking). To adjust, use the 4x 0.9mm hex screws described in step 5.

Then secure the mount by tightening all 8x 2mm hex screws.

14. Unscrew 4x Phillips screws to remove the 4-pin LEMO /i external lens data connector. On the 4-pole microswitch, slide switch #1 to the FF position (direction of lens mount).

15. Remove the Geared Iris Ring (3x Phillips screws).

16. Remove the Geared Zoom Ring (3x Phillips screws).

Canon Flex Zooms: Quick Change between Full Frame and Super35

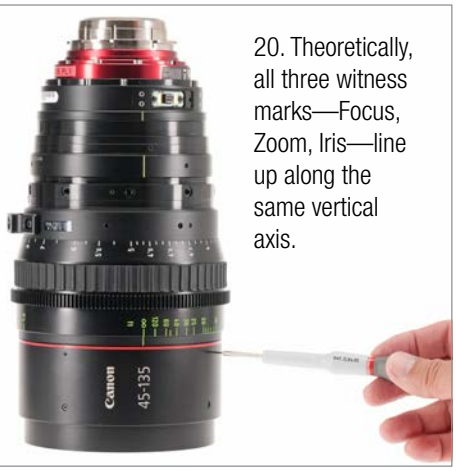
17. Turn the lens so the front faces up. Remove 3x Phillips screws and the S35 Front Ring with the Canon logo and zoom range ID (shown here: 31.5-95).

18. Replace with the Full Frame Front ID Ring (45-135) and secure with 3x Phillips screws.

Focus marks remain the same, so the Geared Focus Ring is not replaced.

19. Rotate the focus ring to the hard stop at infinity. If the focus witness mark does not line up, adjust by loosening 4x 0.95 hex screws, line it up, and tighten. Check on a collimator.

20. Theoretically, all three witness marks—Focus, Zoom, Iris—line up along the same vertical axis.



21. Replace the Geared Zoom Ring and secure with 3x Phillips screws.

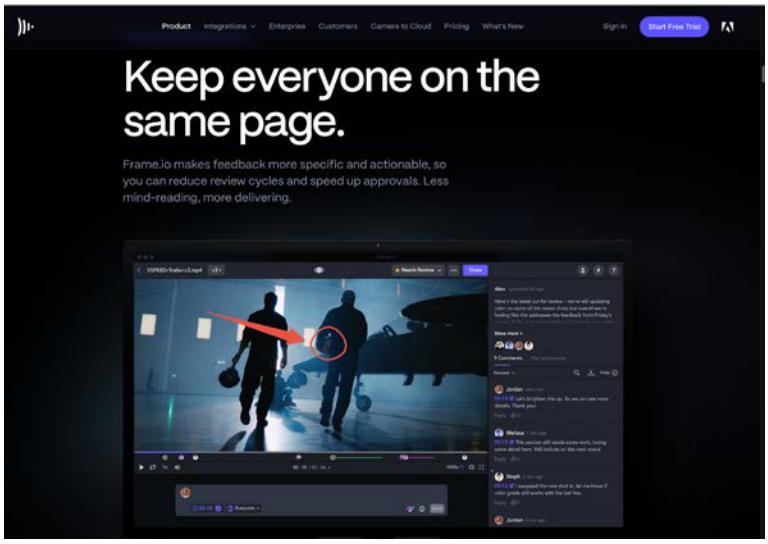
22. Replace the Geared Iris Ring and secure with 3x Phillips screws.

23. Replace the /i lens data external connector with 4x Phillips screws.

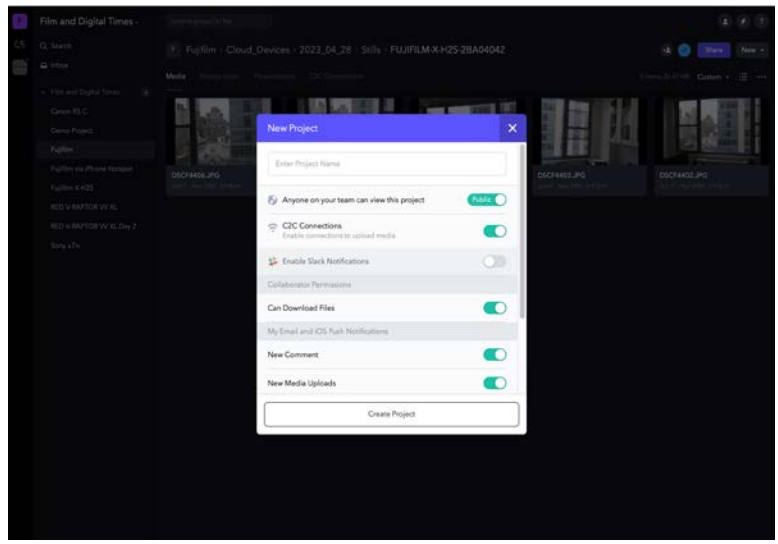
24. Replace the Rear Red Cover, (4x Phillips screws). You now have a Full Frame Zoom. Save everything you have removed for when you want the lens restored back to S35.

25. Hitoshi (Hank) Yoshida, Canon Fellow, Imaging Technologies Group, took about 15 minutes to swap the Flex Zoom from S35 to Full Frame.

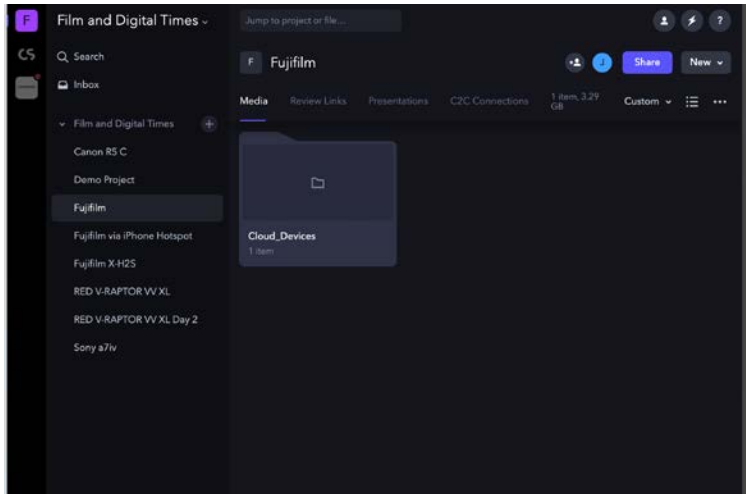
Setting up Frame.io for Camera to Cloud

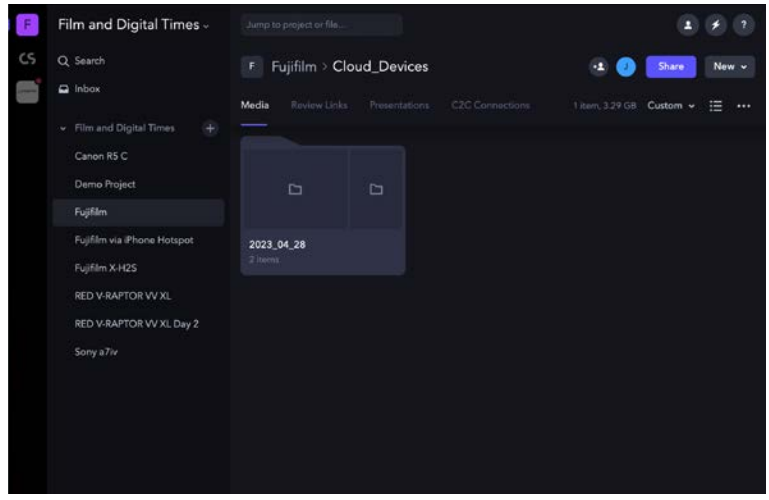


1. Go to: *https://frame.io*
Or, log in directly or sign up for a free trial, at: https://app.frame.io/

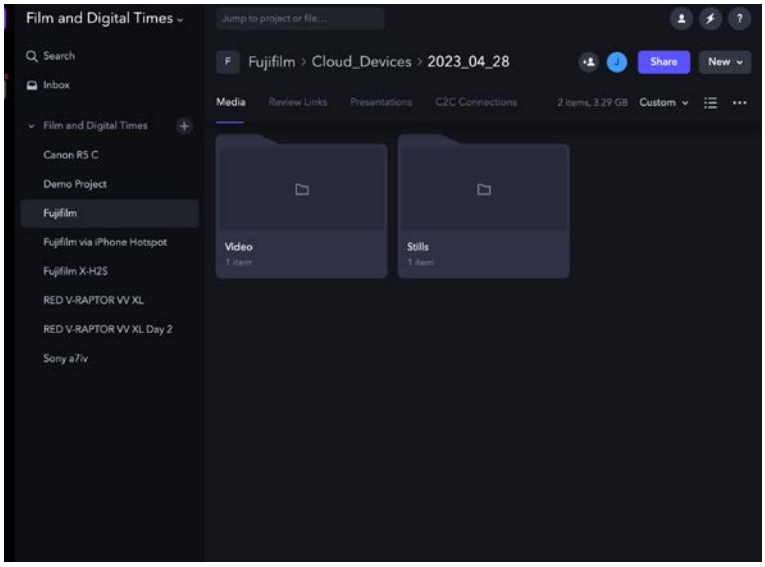


2. Name and set up a new project or go to an existing one.

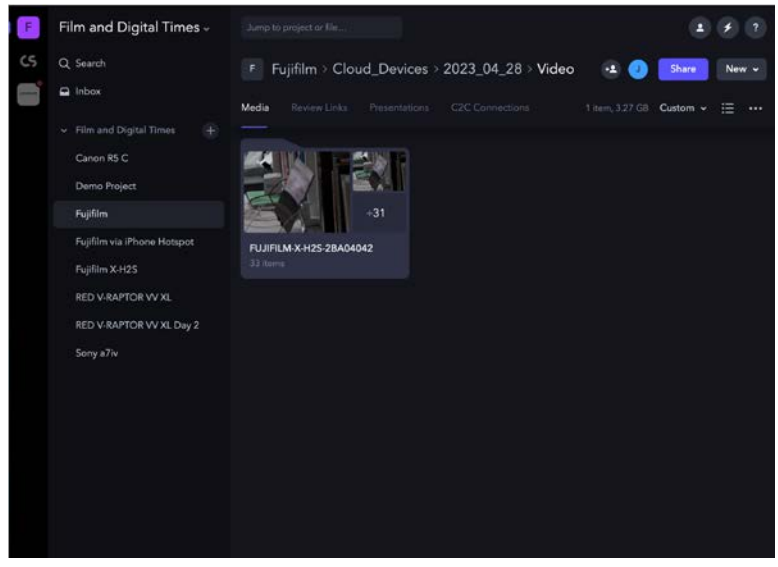




3. April 2023 FDTimes showed how to connect a RED V-RAPTOR VV 8K XL camera to Frame.io C2C.
In the next pages, we'll connect a Fujifilm X-H2S camera.
Select an existing project from the left column. Do not be alarmed if you do not see all your files at once. You have to drill down into the folders.

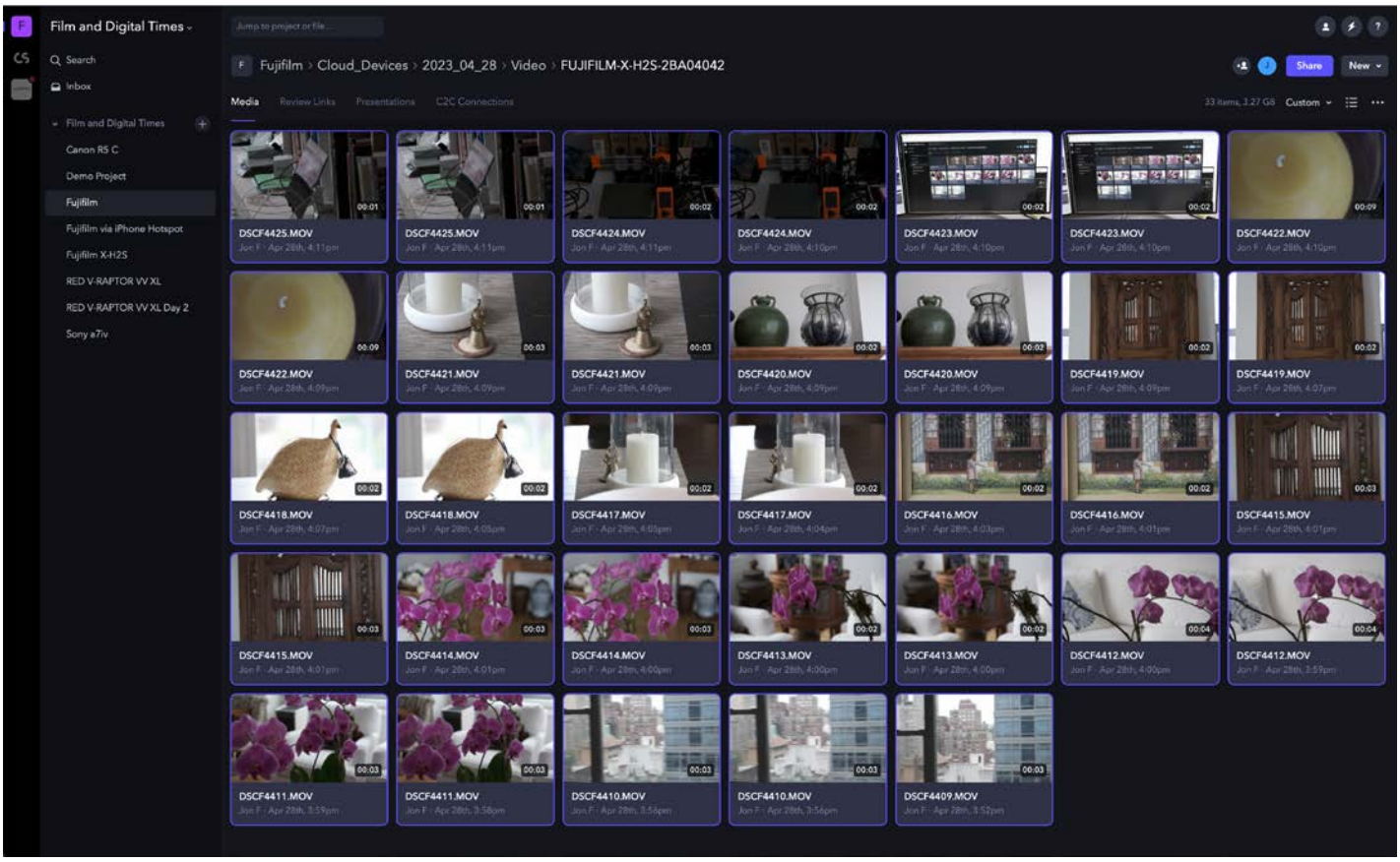


4. Connected to the Fujifilm X-H2S, we have both Video and Stills.

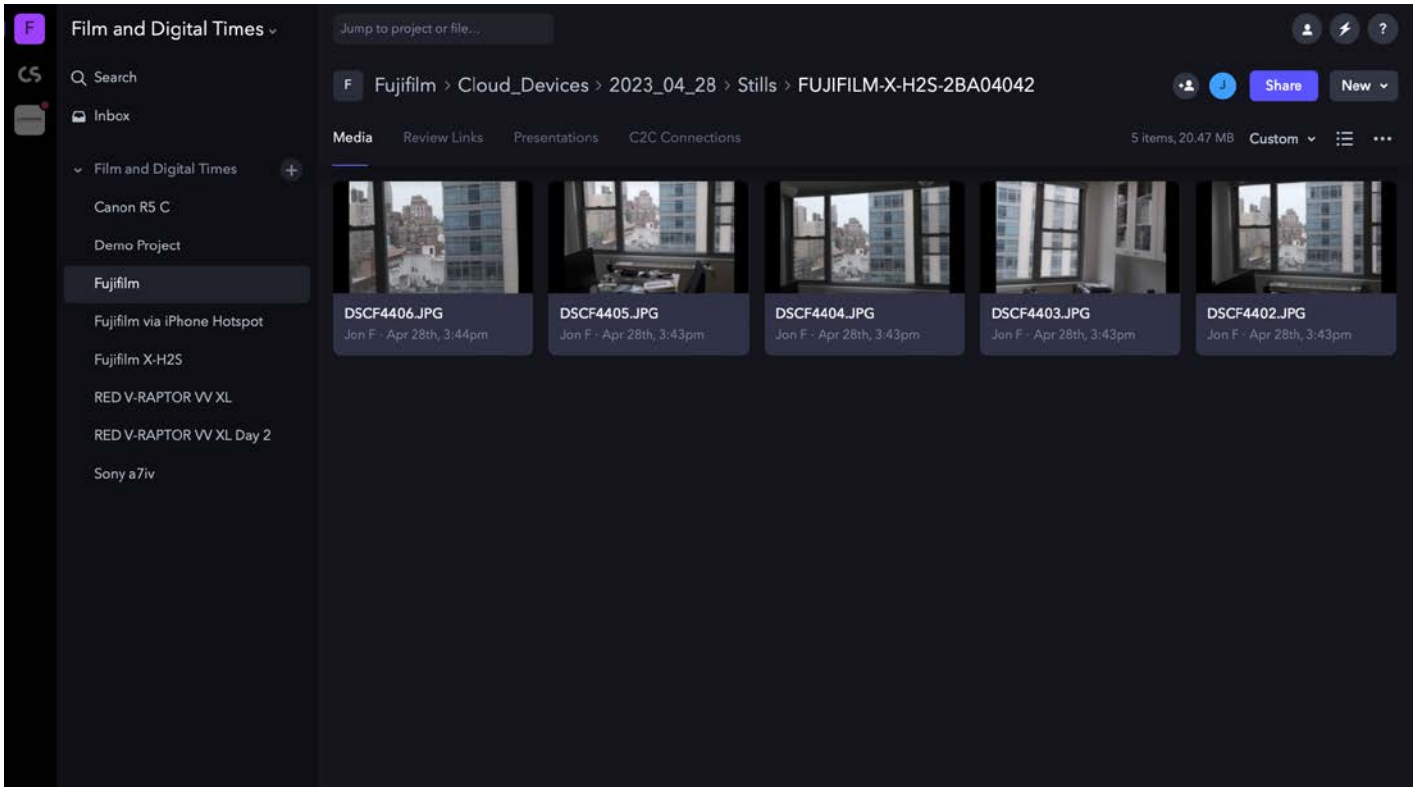


5. Click on the Video folder, and here it shows that we have 31 more clips...

Setting up Frame.io



6. All MOV thumbnails in our Frame.io Video folder are revealed.



7. Selecting the Stills folder, we see the JPG files that have been uploaded directly as we were shooting.

8. For a really good, in-depth guide to Frame.io C2C using the Fujifilm X-H2S, go to: *tinyurl.com/C2C-Fujifilm*

Or, continue reading the next 6 pages.

Fujifilm X-H2S and Frame.io Camera to Cloud

Fujifilm X-H2S with native X Mount (17.7 mm Flange Focal Depth)

Fujifilm X-H2S with X Mount to PL Mount Adapter
(52 mm Flange Focal Depth)

Fujifilm's latest firmware updates—V4.0 for the X-H2S digital camera and V2.0 for the FT-XH file transmitter battery grip—are ready now. These updates let you send still or video files directly from the camera to Frame.io cloud servers for immediate access.

Victor Ha, Vice President of Electronic Imaging and Optical Devices divisions, Fujifilm North America Corporation, said, "It's the world's first native Camera-to-Cloud (C2C) integration capability for digital still cameras in partnership with Frame.io.

"Getting image and video files from your digital camera into post-production is a time-consuming process that can often require creating backups, transferring to hard drives, and then forwarding to the next stop in the production workflow. C2C eliminates these tedious steps."

Transmit a variety of files, including Apple ProRes, Proxy, RAW, MP4 or stills to Frame.io. Files can be sent automatically in batch, individually, or prioritized upon completion of the shot.

Victor Ha continued, "These are exciting possibilities for collaborating with off-site art directors, on-set and near-set DITs, editors, colorists, off-set editors, or anyone else involved in production. From downloading still images, remotely processing in Lightroom or Photoshop, quickly reviewing and choosing video clips, to creating a rough cut, production work can finally start before the waiting even begins."

Fujifilm's firmware updates that enable C2C connections are available as free downloads by X-H2S customers with FT-XH and a paid Adobe Creative Cloud subscription.

For more information about Frame.io: *frame.io/creative-cloud/*

For X-H2S camera firmware updates:
fujifilm-x.com/en-us/support/download/firmware/cameras/x-h2s/

For FT-XH file transmitter firmware updates:
fujifilm-x.com/global/support/download/firmware/accessories/ft-xh/

Fujifilm File Transmitter FT-XH

The gateway for your Frame.io Camera-to-Cloud connection with a FUJILM X-H2S is the FT-XH file transmitter that attaches to the bottom of the camera. It connects to the Internet via an RJ45 Ethernet plug or wireless LAN (IEEE 802.11a/b/g/n/ac WiFi).

FT-XH looks like a familiar battery grip. Two high capacity NP-W235 batteries slide inside. A third battery must be active in the X-H2S. Be sure they are all fully charged.

Fujifilm X-H2S and C2C

Fujifilm X-H2S camera with
Fujinon MKX 18-55mm T2.9 Lens (X-Mount)

Full size RJ45
Ethernet plug under
cover

FT-XH battery grip
file transmitter

Fujifilm X-H2S camera

- Lens mount: Fujfilm X (17.7 mm FFD; 43.5 mm ID)
- 26.16 MP APS-C / S35
- up to 6.2K 6240 x 4160 (3:2 apect ratio) 29.97 fps.
- DCI 4K 4096 x 2160 (17:9 aspect ratio) up to 59.94 fps
- EVF: 0.5 inch OLED Color Viewfinder, Approx. 5.76 million dots.
- 5-axis in-body image stabilization system.
- One CFexpress Type B card slot and one UHS-II SD card slot.

Video:

- MOV: Apple ProRes 422 HQ, Apple ProRes 422, Apple ProRes 422 LT,
- HEVC/H.265
- MPEG-4 AVC/H.264

Stills:

- JPEG, HEIF 4:2:2 10-bit, 14-bit RAW, TIFF 8/16-bit RGB

FT-XH battery grip
file transmitter: WiFi or
Hard-Wire Ethernet

Fujifilm X-H2S camera

Setting up Fujifilm X-H2S for Frame.io C2C

Here is a step-by-step guide to menu settings and Frame.io setup to prepare your Fujifilm X-H2S to send files from Camera to Cloud.

The process is easier and much less daunting than all the steps shown in these storyboard-like steps.

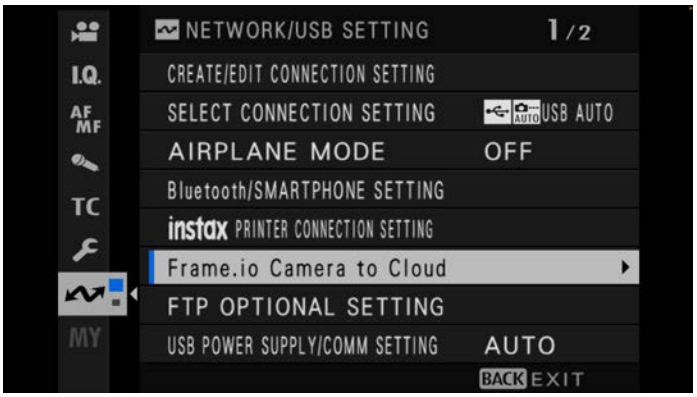
A couple of cautions:

- Make sure the date and time settings on the camera are correct and match the computer time on the device you're running Frame.io.
- Be sure all batteries are charged: 1 in the camera and 2 in the file transmitter base grip.

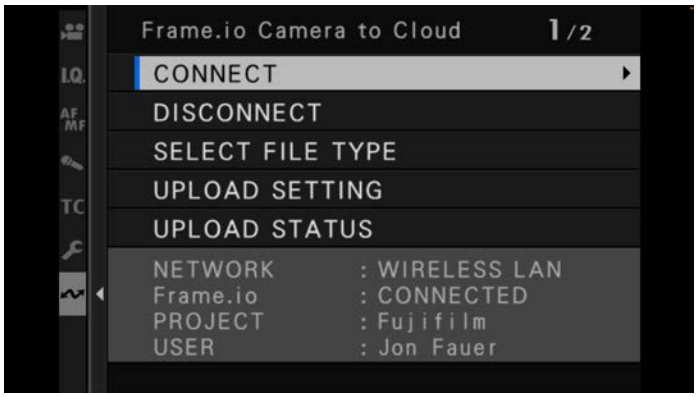
Let's begin:

1. Press the MENU button

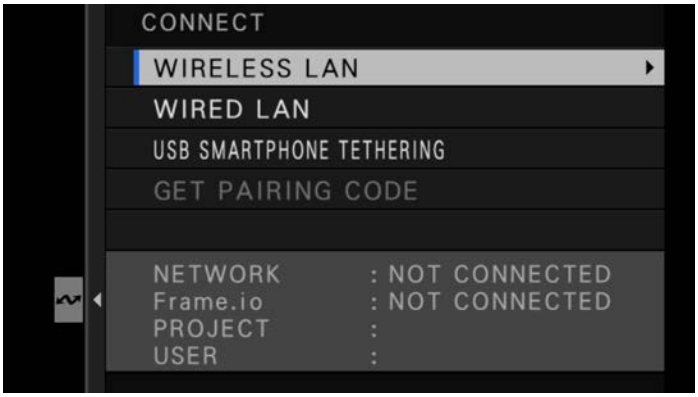
2. Navigate to the double-arrowed lightning bolt icon for NETWORK / USB SETTING.



2a. Menu > Network Settings > Frame.io Camera to Cloud.



3. Select CONNECT.



4. WIRELESS LAN. (If you plugged in an Ethernet cable, choose WIRED LAN.) If you have something connected to the HDMI port, the X-H2S will not progress past the first CONNECT screen. Unplug to connect, and then you can plug in your HDMI device later.

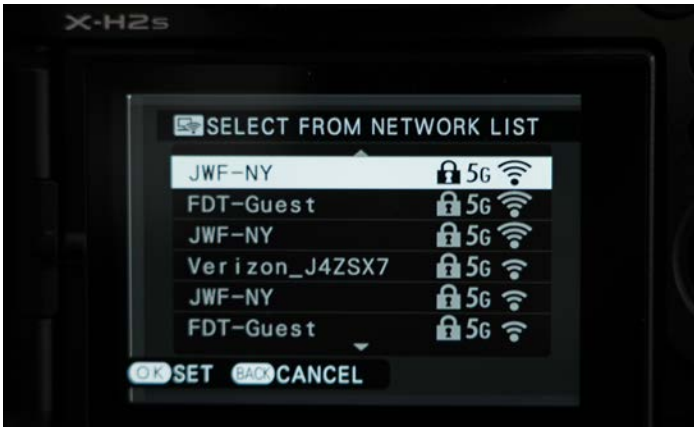
5. If you set up an access point earlier, the camera will try to connect there. In this example, we want to switch from iPhone Hotspot to our faster studio 1G WiFi. To set up the new connection, press the BACK button to stop the camera from trying to access the previous WiFi spot.

6. If you see CONNECTION FAILED, press the BACK button again.

7. Select ACCESS POINT SETTING to set up a new WiFi connection.

8. Select MANUAL SETUP. (SIMPLE SETUP is not as simple.)

9. SELECT FROM NETWORK LIST of active WiFi spots nearby.



10, 11. Select Wi-Fi access point. If you have a mesh network, it's trial and error until you find the right node. Enter your Wi-Fi password. SET to enter.

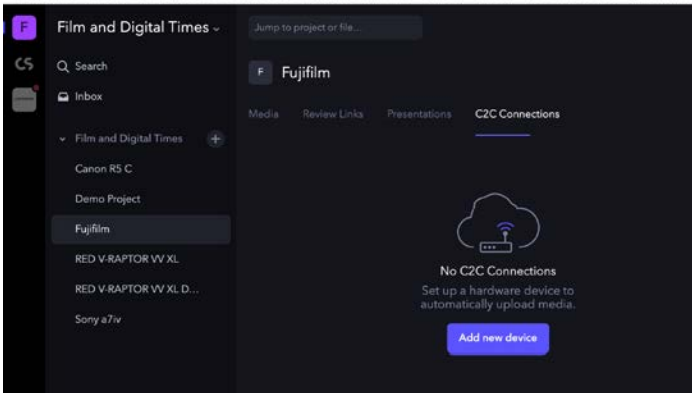
12. Success. Registration on the WiFi network completed.

13. Select FINISH. Still more steps to do — turn to the next FDT page.

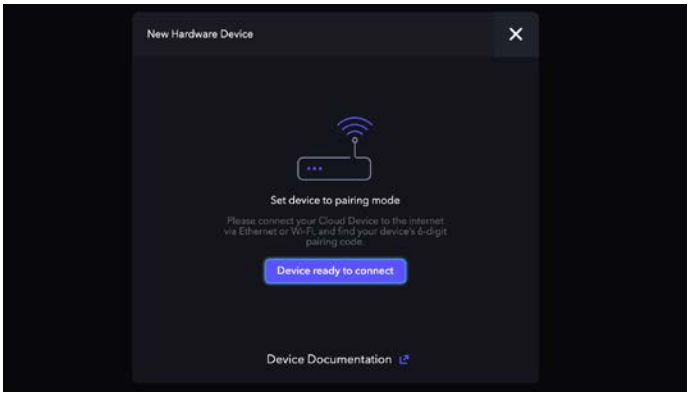
Fujifilm X-H2S with Frame.io

14. Menu > CONNECT > GET PAIRING CODE.

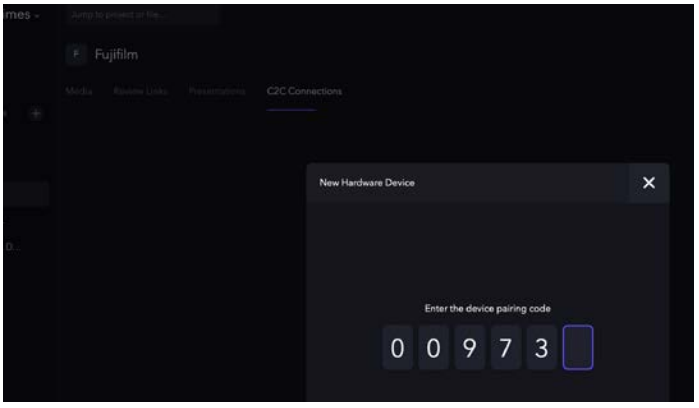
15. X-H2S generates a PAIRING CODE. Log into your Frame.io account.



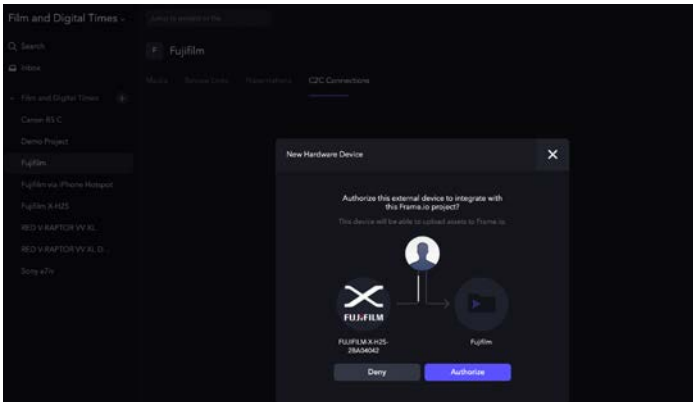
16, 17. Logged into Frame.io (www.frame.io) — highligt a project in the left column or click the "+" icon to create a new project. Next, select the C2C CONNECTIONS tab (center, right of screen). Click ADD NEW DEVICE.



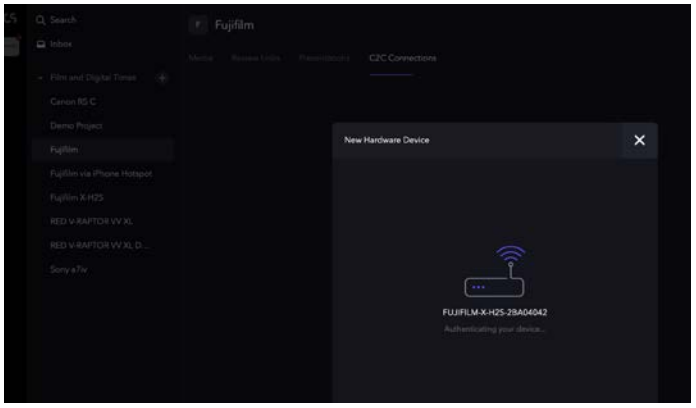
17. Click DEVICE READY TO CONNECT.



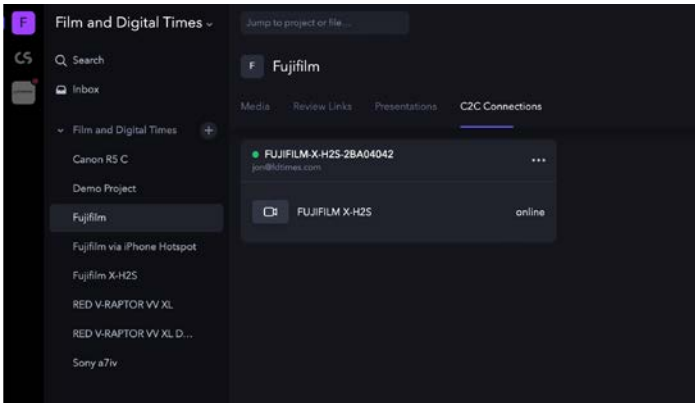
18. In Frame.io, enter the pairing code shown on your X-H2S camera.



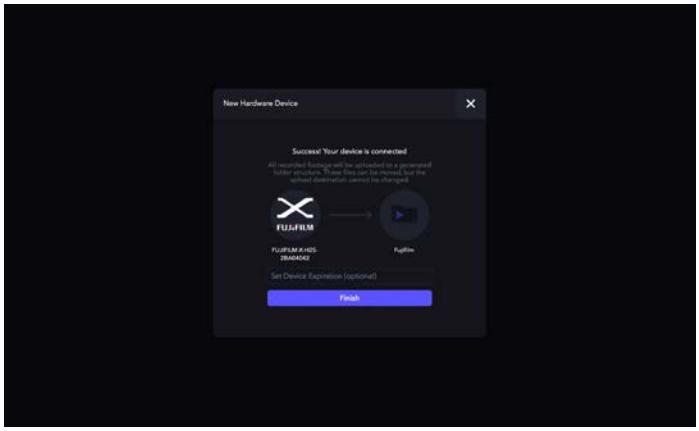
19. Frame.io asks you to authorize. Yes. AUTHORIZE.



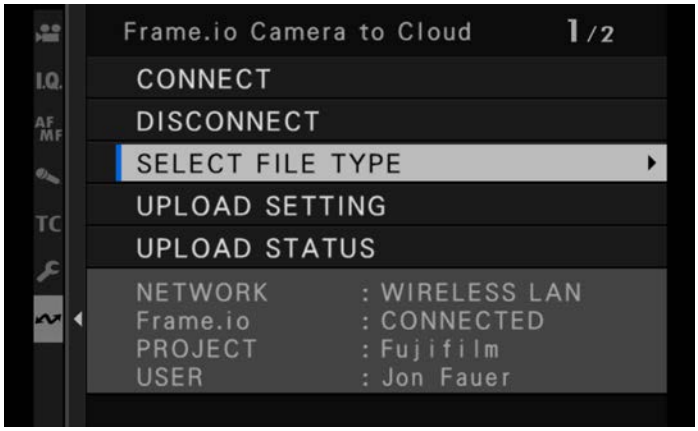
20. Frame.io examines your X-H2S connection and authenticates.



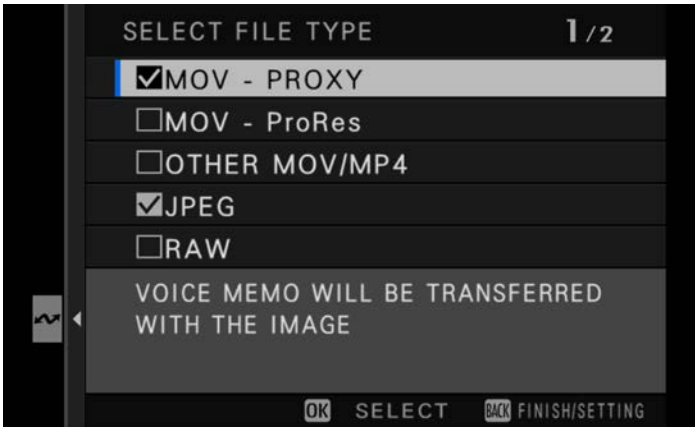
21. You're now online.



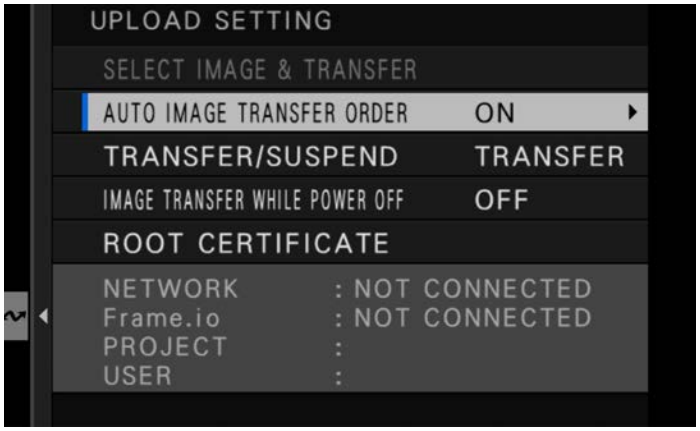
22. “Success!” says Frame.io. Click FINISH.



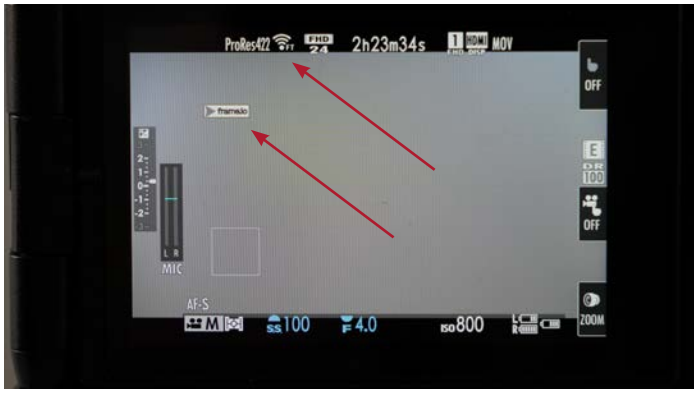
23. But wait. There are a few more settings. SELECT FILE TYPE to upload.



24. If you’re on a slow connection, don’t upload RAW in real time.

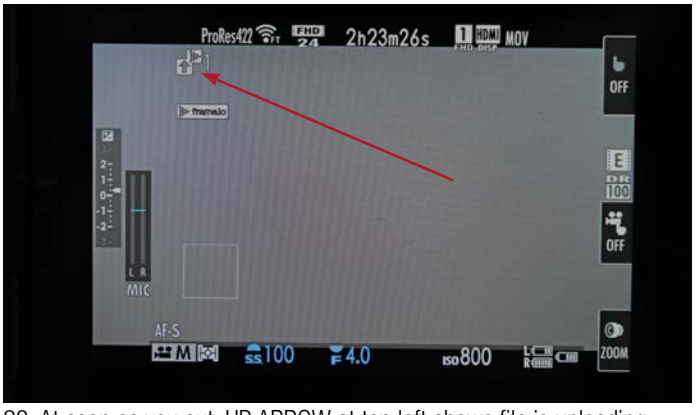


25. Choose your UPLOAD SETTINGS—be sure TRANSFER is enabled and AUTO IMAGE TRANSFER ORDER is ON. (Its default setting is OFF.)

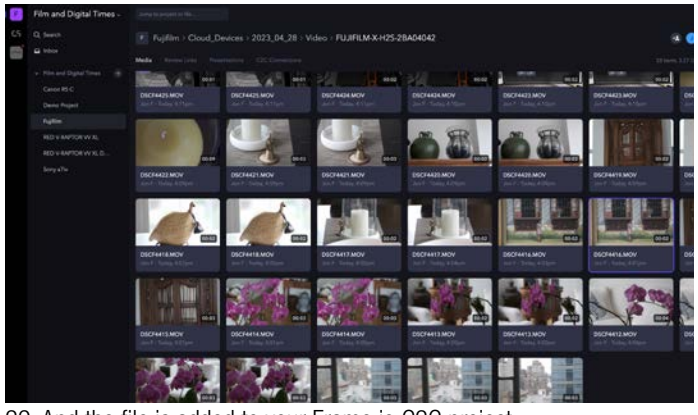


26. Icons: WiFi at top and Frame.io top left show that we are connected.

27. Roll camera.



28. At soon as you cut, UP ARROW at top left shows file is uploading.



29. And the file is added to your Frame.io C2C project.

30. Frame.io has a really good in-depth presentation on C2C and Fujifilm X-H2S: *tinyurl.com/C2C-Fujifilm*

Grant Petty, CEO of Blackmagic Design

Grant Petty, CEO of Blackmagic Design, agreed to an interview at NAB. After some preamble banter about Melbourne having been voted the most livable city in the world and one of the most expensive, Melbourne coffee culture, the merits of chicken fried steak at Cracker Barrel or Denny's, chocolate milkshakes, good restaurants in Las Vegas and Australia, we got down to business.

Jon Fauer: Your NAB booth is super busy.

Grant Petty: There are a whole lot of products here this year. DaVinci Resolve updates were more complicated because there was a lot of stuff coming in. We were scrambling to get everything ready. There was a lot to test.

Do you enjoy this new way of working, where you don't have to announce everything new at a trade show? You've been doing that lately—announcing when you please, when something is ready?

Yes. That's true. But we did announce DaVinci Resolve 18.5 and new 4K switchers here at NAB. We're better at industrial design now. We've been moving to a polycarbonate, carbon type front so when they are rack mounted, if you put a product in three years later, they've got to match each other. You've got to have a consistent looking rack. That was a lot of work.

I like what you did with the OLPF [Optical Low Pass Filter] cover glass on the URSA Mini Pro 12K.

We initially thought that the 12K sensor was higher resolution than what any of the lenses would do. But the lenses have been improving. The lens is no longer acting like a filter. Also, there's virtual production and the need to reduce moiré and artifacts from the LED walls.

But it took a long time to get a proper OLPF because we had to custom design it. It had to match the 12K sensor.

When we were looking at adding the OLPF, some people didn't want it. So now, we offer the choice of having the URSA 12K with or without OLPF.

When you walk through the halls here at NAB, it almost reminds me of the early days of 3D. It was like a gold rush, where almost everybody was jumping on board. What's your impression on where virtual backdrops, moving backdrops, active backgrounds are going?

In any industry with technology in it, as the technology gets funding, don't just look at the technology. Look at the businesses and the way the funding works. At Blackmagic, we don't have any venture capital. We don't have investors. So, we can pursue the work based on challenges our customers have.

The problem is, you can have a lot of people just spouting tech. Because that's what the investor has funded. If you're doing virtual production or something like that, they say, "This is the future."

No. The tech will be a mix of many things. For example, a company may not make much money in the startup phase. To succeed, they have to be dominant, or very big. That's when they're going to get big payoffs.

It's about the way the funding happens. That's why everyone keeps saying, "My tech's going to be the future." You could replace "Virtual Production" with the words "3D" or something else. That's why you get these spikes in tech and then it crashes. Spike and crash.

Are we in that bubble phase?

It's not even a bubble phase, because it's just people calling it

the latest tech, and next year they'll have some other tech. It is a valid part of a mix of things. Yes, it's always going to be expensive. Putting up a big LED wall is expensive.

And then you've got to create the content for the wall. Whereas, you can just go to a location, and it's there. But there are a lot of situations where it's really important and the only option you have. It's a valid part of a complicated range of options when you're shooting.

You can actually do a hybrid of virtual and location production on a film. You could be all one way or all the other. It depends on a production's workup. It's part of a mix. Actually, in some situations, it's the only possible way you have of being able to shoot something.

But, it's not the future. Nothing's the future. But it's an important part of the future. That's a subtle distinction.

Unfortunately, technology is hard for some people to understand. The finance people may not care what it really is, as long as you can provide a compelling reason why that's the future.

All you get is, "Oh this thing's amazing. It's going to be the future."

Everybody knows that these technologies become an important part of a range of options when you're doing production work. It really is part of a mix of things. It's a nice new part, but not everything's going to be virtual. But it's fun. Virtual production is a fun thing to do.

Are you working on it?

A lot of our customers are. They're using our cameras. That's why we had to offer an OLPF for the 12K sensor for a lot of the high-end visual effects work. For me, it was about full RGB, and really high quality anti-aliasing. When you do an 8K sensor for 8K work, the sensor itself is essentially quantizing the image, and you've got little or no control over fine detail. You don't have full RGB color. But we always have gone beyond that. Our original camera was 2.5K—because it went beyond HD.

We always had excess resolution. I've always worried about the edge of the high frequency areas, and how you actually manage that. And so, you want to be able to do it yourself with processing in the camera or even in DaVinci Resolve. You don't want to have the sensor itself defining where the pixels are.

It's like a coarse LED background, made up of large pixels, compared to an LED wall that's so much finer, with smaller pixels, and your eyes essentially define the limit of what you can see. So, it looks realistic. To me, you go beyond the resolution that you're targeting, and then you can control the roll off.

You've also got all the full color resolution. You get beautifully fine quality detail and textures. People may wonder why we did a 6K sensor in a studio camera that's Ultra HD. It's because of the quality level, the fine detail. You can definitely see it in the fine detail. It's just so much smoother and more beautiful. And, we have full control over how that is handled.

Is that a function of down-sampling?

That's an important part of it, because ultimately you do have to down-sample to get to the target resolution. You're doing 12K, but you're delivering in 4K or 8K. But how do we get from here to there?

It's how you manage the edges. Not just delivering a bulk of pixels. It's the image processing path. It's the same with dynamic range. I'm sampling a wide enough range, a higher frequency. I'm capturing more. I have full control of how that gets transformed as the end result. It's a fascinating, complex struggle to think of the right options and the right way to give people flexibility.

Speaking of technology, very few companies at NAB are talking much about AI.

We are. We have tons of it in DaVinci Resolve. We've been doing it for years. But we didn't even know it was called AI at the time. We called it the DaVinci Neural Engine. We wrote all the code, and we've been adding more. Someone was asking the other day, "Does DaVinci have any AI?" And it's like, "Well, everywhere." "Oh, but where?"

They expect there's a button that says AI. But no. The lens flare filter tool in DaVinci Resolve doesn't just draw blurred circles. It simulates lenses. The lens de-warping tool isn't just a warping tool. It also simulates lenses. 3D Tracking was one of the early ones—someone would turn their head in the shot and the tracker would follow.

And Text-Based Editing. Dialogue to Text. That's all AI driven. It's everywhere. It's amazing and cool because it does such a large amount of work for you.

Also Relight, where you can move the light source around, and it literally changes the lighting of the image. And when you're color grading, you can work on the eyes separately from the face. That's all deep-learning in AI.

What about the downsides of AI—writing screenplays?

To me, AI could be like an MBA. Master of Business Administration. You know them. Many of them sit there highlighting data and sounding intelligent. They're packaging what others have worked on.

The problem we have in the film and television industry is that you really do not want to see 15 derivative versions of a series or movie. What you want to see is the first version of it, when nothing else was like that before. You want to see new, interesting things. That's what entertainment is.

It should not be something that just fills a cable channel. Do we want to make fillers, or do we want to make entertainment? That's the question.

The problem with AI is that it aggregates what already exists. It's based on what it finds on the internet. Now, that can be good; there can be a lot of good things that exist. It can find, interpret and present things to you. But it doesn't come up with something that doesn't exist. It effectively combines things. Also, I worry about where it's going to get its information from.

Just by scanning the web— not always reliable information.

If you get AI to write code, what's it actually doing? It's looking through all the open source code that exists and learning how to write code from that.

It isn't often when you get a new generation of things. Like a new generation music, or a new style of movie. I worry that people might over-rely on AI. Sure, they're going to create fillers. They're going to create simple get-to-market things. Maybe some will be entertaining. But, I worry about how kids use it.

I want people to use their brains, and think of something that we don't have, and then create from there. Ultimately, entertainment that is new is what people at home want to see.

Perhaps it will encourage multiculturalism.

I love multiculturalism. Not because you can get great Indonesian, Indian or Filipino food in Australia, and there are different cultures. That's exciting. The thing I love about multiculturalism is that you can have a new culture. When you accept multiple cultures, you also accept something new, and you can discard things that don't work. You can actually have new ways of doing things, new worldviews. Sometimes bad, sometimes good. You get rid of the bad hopefully, and the good should persist.

In some ways, it makes me feel that western culture actually is an accumulation of changes. We're not running around a maypole forever. The world we live in is very different from what European culture once was. It's something else. What is it? We just kept creating it.

The question then becomes, business is not necessarily multicultural. I know that there are some positives in that, but do I have to define everything against revenue and profit? I mean, how do you place a value on your IP? We rarely know how to do it. We can value property, but we seldom define the value of things we create. It's been a problem ever since the industrial revolution, but particularly since the 60s and 70s, when you had more films and music, and all of a sudden software started to come online. It's a huge addition to the economy.

To me, AI should be an assistant to help you go faster. But I'm worried that it could actually create a monoculture where everyone expects you to use it only to blend in. We would end up cutting down unique, smart people who are extraordinary. Instead, we should find ways to enable more of those unique smart people to do extraordinary new things in different directions.

Instead, we are in danger of adopting this MBA mindset where we're just delivering content, and AI is coming up with it. I think AI has powerful uses, as you see in DaVinci, but we don't want to turn our brains off, and become dependent on it. Let's still go for a walk. Let's not just keep using a car. Let's get on a bike or a skateboard. Let's not forgot to use our legs.

Blackmagic URSA Mini Pro 12K OLPF and Netflix Approval

URSA Mini Pro 12K OLPF

April 16, 2023. Opening day of NAB. Blackmagic Design announced the new Blackmagic URSA Mini Pro 12K OLPF.

The original URSA Mini Pro 12K camera did not have an optical low pass filter (OLPF) in front of the 12K Super 35 image sensor. Now, users have a choice. Both models are US$6,385.

The OLPF is made of birefringent crystals that reduce artifacts such as moiré and aliasing, while preserving color and image detail. Optics-Online (Sunex, Inc.) explains: Since CMOS sensors sample image information at regularly-spaced, discrete points called pixels, each sensor has a frequency limit, called the Nyquist frequency. This frequency is equal to the inverse of the two times the pixel pitch. If the lens passes spatial frequency that is greater than the Nyquist frequency of the sensor, it cannot be resolved by the sensor. Worse, spatial frequencies that are greater than the Nyquist frequency will cause aliasing artifacts. These phenomena are often observed as colorful fringes on the image called Moiré fringes."

Blackmagic notes: "When shooting in virtual production environments, the high frequencies of the LED matrix in video walls can cause problems for ultra sharp modern lenses and high resolution sensors, creating interference patterns. Using an optical low pass filter minimizes that interference, which results in a reduction of moiré and aliasing.

"URSA Mini Pro 12K OLPF adds a high performance, optical low pass filter that is precisely matched to the 12K sensor. The OLPF also incorporates updated IR filtering that improves far red color response which, when combined with Blackmagic RAW processing for the URSA Mini Pro 12K OLPF, preserves color and critical image detail for new levels of image fidelity."

The Blackmagic URSA Mini Pro 12K camera has a 12,288 x 6480 12K Super 35 sensor and 14 stops of dynamic range. That works out to 80 Megapixels per frame—which can also be helpful when extracting still images from your video.

Oversampling from 12K results in 8K and 4K images with the subtle skin tones and extraordinary detail. You can shoot up to 60 fps in 12K; 120 fps in 8K; and 240 fps in 4K Super16.

URSA Mini Pro 12K OLPF is now Netflix Approved

Blackmagic Design's URSA Mini Pro 12K OLPF digital film camera was recently added to the Netflix Approved Camera List.

The URSA Mini Pro 12K OLPF digital film camera, has a 12,288 x 6,480 12K Super 35 image sensor, 14 stops of dynamic range, high frame rate up to 60 frames per second in 12K at 80 Megapixels per frame, a new OLPF model with an Optical Low Pass Filter, interchangeable PL mount, built in ND filters, dual CFast and UHS-II SD card slots, and a USB-C port that can connect to an SSD for external recording.

Netflix Approved Camera List

Netflix explains: "To help creatives produce their best work and create compelling visual experiences for our audience, Netflix requires 90% of a program's final total runtime to be captured on approved cameras using the following capture requirements. For nonfiction content, this threshold may be more flexible.

- Resolution: Minimum of 3840 photosite capture width (with spherical lenses).
- Codec: Lightly Compressed or Uncompressed RAW — or Intraframe Based Codec with 4:2:2 Chroma-subsampling or Greater
- Bit Depth: 10-Bit or Greater
- Data Rate: Minimum 240 Mbps at 24 fps
- Color Space: Scene-referred Color Space (S.Gamut3, ALEXA Wide Gamut, REDWideGamut, etc.)
- Transfer Function: Scene-referred Transfer Function (S-Log3, C-Log, Log3G10, V-Log etc.)
- Timecode: System is capable of jamming to an external source. Timecode should be written as metadata.
- Note: Not all cameras that meet these capture requirements are approved. These requirements are the minimum specifications necessary for a camera system to be considered for approval. Other attributes must be taken into account such as dynamic range, form factor, stability, workflow compatibility, and more.
- For more information: *tinyurl.com/Netflix-approved*

Tashi Trieu on Grading *Avatar: The Way of Water*

Tuk (Trinity Bliss) in 20th Century Studios' *Avatar: The Way of Water*. Photo courtesy of 20th Century Studios. © 2022 20th Century Studios.

Tashi Trieu was the Digital Intermediate Colorist on Avatar: The Way of Water. Other credits as Colorist include Bombshell, Titans, Jungle Book, *etc. He has taught DI color grading and finishing at Chapman University and Taipei National University of the Arts.*

Jon Fauer: Did you work with Russell Carpenter and James Cameron on a "show LUT" for the VENICE ?

Tashi Trieu: WetaFX built the LUT. It's an S-curve with a custom color matrix to go from S-Gamut3.Cine to P3D65 Gamma 2.6 with a slight bit of scale reduction to give a little more latitude in the gamut. This was the base LUT that all theatrical and home video trims were produced from.

Please explain the steps of working with VENICE footage.

All Sony VENICE X-OCN RAW source material was processed through dailies and pulled as OpenEXR plates for visual effects. Even a couple shots that were not visual effects were processed in the same way so we had a consistent workflow. No Camera RAW material was directly involved in the DI.

Our VFX finals were all OpenEXR as discrete left/right stereo files complete with embedded mattes for use in the DI.

Was it like the workflow described by Jason Fabbro, Senior Colorist at Picture Shop, described in FDTimes January 2023? *fdtimes.com/pdfs/free/118FDTimes-Jan2023-2.00-150.pdf*

The workflow Jason detailed in that article is a pretty straightforward non-color-managed workflow. This is the "traditional" way that DI's have been done for years, source material (usually log film scans), grading in the camera original scene-referred domain, and an output LUT for transformation (like a film-print) to display. Then various versions of that LUT are applied for various different projection formats or display formats.

This is how I worked as well, with the only notable exception being that our linear OpenEXR source files received an Input LUT in DaVinci Resolve to transform them to S-Log3 for grading.

Please take us through the grading workflow with the VENICE footage and tell us about the nodes.

I use a pretty simple approach, relying on just a few nodes and then expanding as needed. I find that complicated, pre-fixed node graphs are nice in concept, but end up being confusing or limited, at least to me. I think you have to evolve your workflow on a scene-by-scene basis throughout a film. When you're working on continuity, matching, or any technical sort of color grading exercise, you're usually limiting that to a particular scene that exhibits those needs. So it's worthwhile to maintain a degree of consistency in approach throughout a scene that could logically receive a global trim at some point. But there's no reason to handcuff yourself to an identical approach for a different, dissimilar scene.

I used Groups in DaVinci Resolve for applying the show LUT only to scene-referred footage (VFX) and a different group for any graphics like subtitles, titles, credits, etc. This gives you a lot of flexibility to work towards different deliverable formats within the same project. A unified, project-based color management solution, like what you can do with Resolve Color Management or ACES, would complicate matters rather than simplify them. On a project like this with so many distribution deliverables, simplicity is the smartest strategy.

You have discussed using the Edit page in DaVinci Resolve. Why and where?

(L-R): Neytiri (Zoe Saldaña) and Jake Sully (Sam Worthington) in *Avatar: The Way of Water*. Photo courtesy of and © 2022 20th Century Studios.

I have a background in online editorial and am not afraid to jump in and make shot updates. Anytime it made sense for me to make a conform change or build out new versions of timelines, I would. My DI Editor, Tim Willis, handled the vast majority of the conform work and version management, but sometimes I had to get my hands dirty too. Big team effort.

What monitors do you use while grading?

For the theatrical versions, Dolby Vision laser projectors and Christie CP2220 with RealD 3D.

For the home entertainment versions, Sony BVM-X300 and BVM-HX310.

Was grading live or remote?

All of our grading on this film was done live, in-person, in Wellington. 3D and High Frame Rate presented some significant engineering challenges for high-quality real-time review. It's also a lot easier to work together with the sort of immediacy an in-person session provides that even the best teleconferencing setups can't. In situations where travel is not feasible, remote workflows make a lot of sense. In this case, it was just easier/better to be there in person.

(L-R): Lo'ak (Britain Dalton) and Payakan in 20th Century Studios' *Avatar: The Way of Water*.. Photo courtesy of 20th Century Studios. © 2022 20th Century Studios.

Tashi Trieu. Photo by Chris Pritzlaff.
tashitrieu.com

Sony FX3 and Wooden Camera Accessories

Cage-Free Sony FX3

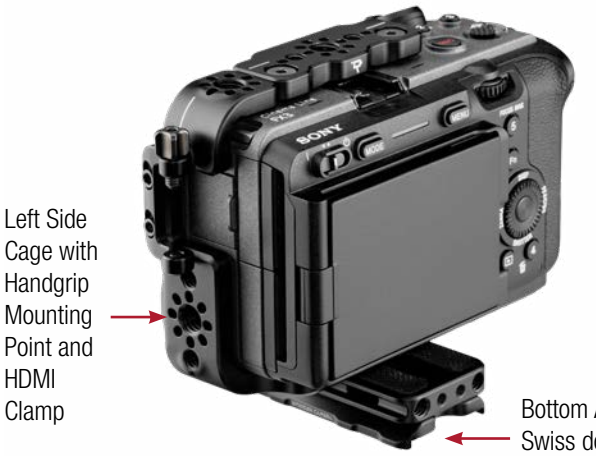
When Sony launched their smallest Cinema Line Camera on February 23, 2021, they wrote, "it delivers not only a coveted cinematographic look, but also enhanced operability and reliability, extending beyond traditional cinema camera form factors."

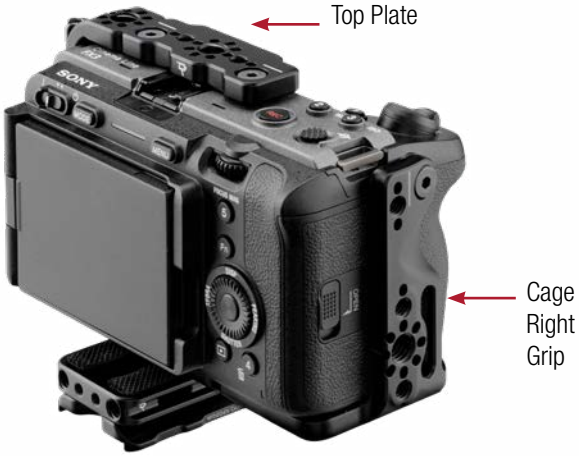
FDTimes wrote, "ILME-FX3 does not look like a typical cine camera. It has the appearance of a ruggedized Sony interchangeable lens mirrorless E-mount alpha series camera whose viewfinder has been sliced off in the service of a solid and symmetrical body.

"As for enhanced operability and reliability, the FX3 has an abundance of 1/4-20 mounting points threaded into its unibody magnesium shell over a stainless steel skeleton. Its cage-free design begs you to mount this camera anywhere—in all kinds of places where a single mounting point and add-on cage wouldn't dare to thread. FX3 will be free to range almost everywhere because it is small, light and ergonomic; common wisdom is that the best camera is the one you always have with you."

I should have expected that calling it "cage-less" implied you don't need a cage, and that is like asking a child not to jump in the nearest puddle. Of course there would be a cage and clever accessories—and they are now here from Wooden Camera.

Wooden Camera L-Style Cage with Base and Wrap-around Cage Grip





Wooden Camera Accessories for Sony FX3 and FX30

Michael Tolar is the Design Engineer at Wooden Camera who designed the FX3/FX30 cage system for Sony FX3. He explained:

The FX3 project started after I heard that we were getting requests for an FX3 accessory kit. This was almost two years after the camera came out.

I have an FX3 myself. I was doing wedding filmmaking on the side and I started shooting with my FX3 back in 2021. It was miles and worlds beyond what I had used before and is still my favorite camera.

The primary motivator for me doing the FX3 project was learning that a lot of users were looking for a rigging system from Wooden Camera and making these requests.

As a wedding filmmaker, I had been going pretty lightweight, so I didn't do a lot of rigging. I eventually came to need one or two accessories on my camera, mainly the time code generator from Tentacle. I needed some way to mount it on my camera. I hated using Velcro because it peels off and it gets messy when it's hot.

Personally, I didn't use the microphone handle top assembly that comes with the FX3. It adds a lot of bulk. I was running around with a gimbal most of the time and trying to keep everything as lightweight as possible.

I also didn't use the base plate or even the external battery plate. Again, I was trying to keep everything as light as possible. I was running around for 12 hours with the camera gimbal. So the first step of my design was the lightweight cage.

But, a lot of users were asking for extra mounting points on the top handle, a riser system to attach to a Studio Baseplate, and a bigger external battery to run an onboard monitor, wireless video transmitter and other things. So, those accessories are available as additional options.

This essential main piece that you must have is called the Cage for Sony FX3/FX30. This is the L-Style Cage with Base that attaches to the bottom and camera left side of the camera, provides a handgrip mounting point with anti-twist pins along with an HDMI connector clamp, and then wraps around the top left side with an additional mounting point.

Our Cage Right Grip attaches to the camera right side and follows the contours of the camera so it's comfortable and provides some additional mounting points, including one for a handgrip. There are 3/8-16 threads—symmetrically placed on both left and right sides. There's clearance underneath the bottom so the battery door can pop open without removing the cage.

The FX3 camera, when it was released in 2021, was very unique in that it had 5 mounting points. They wanted the camera to be cageless. Unfortunately, they didn't put any anti-twist pinholes around those bolt holes. So making it cageless was really like an invitation for us to make a cage.

There's a choice of Micro V-Mount or Gold Mount battery mounts for the battery slide that slides onto rods at the rear.

I think the most interesting thing about this project is that I really cherish the privilege to get to design something that represents the brand I work for. It's kind of like wearing a t-shirt that you designed. It was a cool opportunity because I love working at Wooden Camera. They've given me a lot of opportunities to design some interesting products. I brought the FX3 cage idea to my boss, Dominick Aiello, and he said, "Bring it on." The entire team at Wooden Camera was enthusiastic and super helpful.

Jarred Land, President of RED, on new KOMODO-X

The last time we saw Jarred Land holding the KOMODO for FDTimes was in a cover photo that just happened to be taken by Brad Pitt in Los Angeles.

This time, Jarred is holding the new KOMODO-X in the trendy fashion film and photo stages at Pier 59 in New York, this time taken by me. Sorry Brad, I got the scoop this time.

The night before, a stream of texts scrolled by as Jarred, RED's president and Co-Owner, was hand-carrying a still-unannounced camera model, flying into JFK from LAX, which was seriously delayed.

He was enroute to New York to check in with Henry Braham BSC and part of his camera team about their recent film *Guardians of the Galaxy Vol. 3*.

It's encouraging when the head of a company takes the initiative and enjoys spending so much time listening to customers, DPs, ACs, Directors, Producers and other crew, something that Jarred seems to spend the majority of his time doing.

The interview was last minute. As I have come to expect, a barrage of Jarred's text messages flew in as we tried to work out an opportunity to connect. Jarred's side of the messaging went like this:

- I think I'm in NY for 24 hours.
- Do you have time to meet?
- I have a new camera with me which would be great for you to see.
- On tarmac at LAX forever.
- Finally ready to take off to JFK.
- Can I send you specs and stuff once they are done today ?
- Still working on it from 30,000 ft.
- This is a rough draft.
- Data is good.
- Landed JFK.
- What's your late afternoon like?
- Let's meet at Pier 59, in Studio 1.
- It should have good light for photos.
- Me holding the camera again?
- I probably won't be great in front of your camera but this new KOMODO-X camera is very pretty.
- Sorry, side trip to B&H Photo, done and heading over now.
- OK, see you in an hour.

Jarred Land, President of RED, on new KOMODO-X

Jon Fauer: What's the back story behind this new camera sitting in front of us?

Jarred Land: This is the KOMODO-X. It's our new camera that fills in the space between the KOMODO and the RAPTOR

A modern Eyemo, an advanced professional style GoPro?

The original KOMODO was designed as a crash camera, a camera as small as possible with most everything that wasn't absolutely necessary stripped away for shooting action sequences. An incredibly capable "utility camera," as Phil Holland coined it, a camera born from a lot of requests from Cinematographers and Directors for something better than a GoPro, but still with a Super35 sized sensor and proper image quality. Those little action cams were incredibly convenient but often limited to less than a second in a movie before the audience would notice the quality difference and wonder, "Hey, what's going on?"

We were working on a global shutter sensor that fits this request ideally, because certainly you want a global shutter for fast movement or explosions, fire, flashes, strobes and even fight sequences with handheld work. So that was the genesis of the original KOMODO camera. We released it and everybody who was shooting those type of scenes loved it—a small camera, with long battery life and it did what they needed it to do extremely well.

What we didn't anticipate was a whole other community of filmmakers who adopted the KOMODO—mostly for its low price point and incredible image. Because of this, some people used it not as a "C," "D," "E" or "F" camera, but as their "A" or "B" camera, which we didn't really expect.

Unfortunately, using the KOMODO as an "A" camera wasn't the easiest because, as a crash camera, it didn't have a lot of the things an "A" camera would. Its audio was basic, the monitoring options were limited and so were the types and amounts of ports, etc. It was great because the entire third-party accessory industry got working to making things to resolve this, but it was clear to us that as much as people loved the KOMODO, there was a strong desire for something a bit bigger with a bit more capability to sit between the little crash cam and its big brother, the RAPTOR.

We call the new camera KOMODO-X and it's not a KOMODO 2. It's not a replacement for the original KOMODO, which is still best for what it was designed to do as a crash cam. This new camera fills in a lot of the holes for those filmmakers. KOMODO-X gives you twice the frame rates of KOMODO (up to 80 fps at 6K 17:9 and 120 fps at 4K 17:9). It uses a much faster CFexpress card for data, just like the RAPTOR. The original KOMODO uses CFAST 2.0 media, as CFexpress was still a bit uncertain at the time we started developing KOMODO. KOMODO-X fits nicely between the KOMODO and the Super35 V-RAPTOR, at a reasonable price.

What is the reasonable price?

Just under $10,000. And it's amazing what it can do. It's really wonderful to be a filmmaker right now. This camera has a lot better image than cameras costing 4, 5, even 10 times the price from the last decade, in a size that is almost unimaginable. You can just pick up a KOMODO-X and shoot a movie with it.

We're kind of excited to see how it fits in with our customers who shoot such a wide range of projects with such a wide range of budgets. You have a beautiful, compact, lightweight camera that is very conducive to handheld shooting but also capable of building up into a studio configuration.

It looks almost the same size as the original KOMODO.

It has the same width and height. It's just a little bit longer than the KOMODO. But, if you used a V-mount adapter on the back of KOMODO, the KOMODO-X is actually a bit smaller, all things considered. It's the size a lot of filmmakers really seem to respond to—with the little Medium Format style shape from yesteryears and this mechanical shape, even though it's a box, really resonates with people. We're excited to see how it is received, and how people use it.

Do you anticipate people operating it Hasselblad style?

Yes, for sure. In a pinch, or by choice, you can definitely get away with it. It has the same monitor on top as the original KOMODO. Let's be real it's not a very large screen for critical viewing; a bigger monitor on the top would have been great, but we didn't want to make the whole camera bigger just to have a wider top screen. The nice thing about the KOMODO-X is that you now can bolt a DSMC3 monitor to the top of it as well, if you want, and it takes power and signal from the top connectors. Of course, there is also a 12G-SDI port so you can put whatever third-party monitors you want on as well.

Is there more dynamic range than original KOMODO?

Yes. And it still has a global shutter, of course, being a KOMODO. There's less noise in this all-new, improved pixel design, 6K sensor. That's how we get more dynamic range with an extra half stop in the shadows.

How is the audio improved?

KOMODO-X has a new audio circuit, a bit newer than the one we used in RAPTOR. It now has proper levels and preamps with a lower noise floor.

What about accessories?

Our RF to PL mount with an electronic ND is finally available to order and should be shipping by the end of the month. We also have a new NANO V-mount battery that fits the profile of the KOMODO-X nicely, and a new top handle for the camera. A few expander modules are coming and a few other bits are also on the way, and our monitor program will hopefully start to make sense later in the year.

Who are the intended users?

It is really right in the middle of the KOMODO and the V-RAPTOR, but as explained earlier, I expect it to bias a little more towards the KOMODO user who took that camera and wrapped it in bits and pieces to make it as much of an "A" camera as possible. I think those users will be very drawn to the KOMODO-X.

A while ago, there were cameras for high-end or low-end, but there wasn't much in the middle.

That's changed a little. It's because a lot of people have been shooting with mirrorless cameras, which can give a pretty good image in ideal conditions. There becomes a point where those users start hitting the limitations of those cameras and start looking to move up. This new wave of filmmakers have created a new middle market, just above what was once called "prosumer" and KOMODO-X fits beautifully in there.

Why do mirrorless hybrid camera companies have a body design that is quite different from KOMODO-X?

They stuck to their traditional still camera design. That form factor is good for shooting stills, with its fixed EVF. That may not be great for video. Somewhat fitting is that still camera users on the high end in the past would move to a Medium Format camera, which the KOMODO and KOMODO-X emulate in form factor.

What do you tell a person who's trying to decide between a mirrorless hybrid camera or a KOMODO-X?

It depends how serious they are about hybrid. If they really shoot stills at a very high level, need flash sync and incredible autofocus for stopping motion of fast moving objects, I would probably tell them to buy a Canon R3.

That's ironic, coming from someone who is co-owner of RED.

Yeah, I probably should be saying something different. The truth is that I am not only an all camera collector, but also an all camera user, from all brands. Of all my cameras, I use an R3 to shoot stills the most. It's an incredible camera that I usually carry along with whatever RED I have in my bag. And, it's nice now that all the RED camera bodies share the same RF mount, so that makes lensing a lot easier. Having said all that, there is something very special about also pulling stills from motion video. But the still camera is going to do some things a little bit better—their auto focus can detect people, birds and objects way faster than we can. Now, if you primarily are shooting motion, with the intent to pull stills, the KOMODO's global shutter is great for that.

A lot of mirrorless cameras have rolling shutters, so if you pan too quickly, or the action is fast, or you have explosions or flashes, a camera like the KOMODO-X takes a quick lead. And you don't need to worry about it overheating every 15 minutes. Also, this assumes you don't have a crew that needs to start plugging things into your camera—like timecode, monitors, genlock, audio, etc—in which case most mirrorless options are limited.

Comfortable on a tripod?

On a tripod, that's a given. But handheld, these little KOMODO-X cameras are at home. Not just putting it on your shoulder. These cameras are now small enough where they're literally being held in your hands. We just talked with Henry Braham, BSC who was the Cinematographer on *Guardians of the Galaxy Vol.* 3 with KOMODO and Leitz M0.8 (as well as MONSTRO, V-RAPTOR and RANGER with Angénieux Optimo and EZ zooms). He talked about moving and handholding the camera and how intimate it is to do that. That's where I think this form factor really works.

Ben Affleck talks about the same thing: just being able to get in there with a small handheld camera.

Absolutely. It's about the intimacy and not being intimidating. When you have a little camera, talent acts differently as well. You can get in close and it's not as much of a distraction as when you have this big camera with a Medusa of stuff around it, or on a big crane poking into you, or on a dolly about to run you over. It's a lot less threatening in a way the actors can sense and feel.

Which brings us to our ongoing discussion about Full Frame and Super35. KOMODO-X is Super35.

It's funny, because to me, bigger sensors are really the way forward. You and I have talked about that a lot. With a bigger sensor you can have bigger pixels, which have less noise and may be more sensitive. Now, the reverse of this—and why I think Super35 is very viable—is for sports, wildlife, and being able to use nostalgic lenses that only cover S35.

The benefit of S35 is you can get more magnification from your lenses while keeping the resolution, and (usually) a more telephoto angle with a smaller sized lens. That's where Super35 really shines, and that's why we make both a 8K Super35 V-RAPTOR as well as an 8K Full Frame/VV size V-RAPTOR.

Almost all the natural history crews for Nat Geo, Discovery and BBC want very long lenses. You get 1½ times more focal length with Super35 lenses. So they like Super35 cameras. The downside of S35 is that the smaller pixels take in less light, so you just lose dynamic range.

The new KOMODO-X has a more rugged mount than the original KOMODO?

Yes. KOMODO just had an RF mount, which I think is the best short flange-depth, mirrorless mount there is. The new KOMODO-X also has an RF mount, but we added a locking ring similar to the one we have on the RAPTOR. It locks the lens onto the mount very securely, and is very good at minimizing deflection with big lenses that causes backfocus issues.

Are you ever going to make EVFs for your cameras again?

Yes. The majority of our users now prefer the onboard monitor. But a lot of people (very vocal people) still ask for EVFs, and for good reason, so we are addressing that as soon as we can.

Congratulations on another fine camera.

Thank you. I always enjoy the process of doing these discussions with you. *red.com/komodo-x*

RED KOMODO-X

Camera Left Side

Lever Lock
RF Mount:
20mm FFD
54mm ID

Camera Right Side

CFexpress
Type B

USB-C

12G-SDI out

Headphones

Audio in

EXT

6-pin 11-17 V DC in

Rear Connectors

RED KOMODO-X

Top

Bottom

Micro V-Lock
Battery Interface

REDVOLT Micro
V-Lock Battery

RF to PL Mount Adapter
Side Ribs and Accessories

Top Handle

RED KOMODO-X Specs

SENSOR

- SENSOR: KOMODO-X 19.9MP Super 35mm Global Shutter CMOS.
- EFFECTIVE PIXELS: 6144 (h) x 3240 (v) • DYNAMIC RANGE: 16.5+ stops
- SENSOR SIZE: 27.03 mm x 14.26 mm (Diagonal: 30.56mm).

LENS MOUNT

- MOUNT: Integrated locking RF mount with electronic communication
- Supports /i PL Lenses with RED RF to PL Adapters
- Supports Canon EF Adapter with communication and other adapters based on the RF mount

RECORDING

- MAX DATA RATES: Up to 560 MB/s using RED or other qualified CFexpress cards
- REDCODE RAW MAX FRAME RATES: 80 fps at 6K 17:9 (6144 x 3240)
  96 fps at 5K 17:9 (5120 x 2700)
  120 fps at 4K 17:9 (4096 x 2160)
  240 fps at 2K 17:9 (2048 x 1080)
- PLAYBACK FRAME RATES (PROJECT TIME BASE): 23.98, 24, 25, 29.97, 30, 50, 59.94, 60 fps, all resolutions
- BEST AVAILABLE REDCODE SETTINGS: REDCODE HQ, MQ, LQ, and ELQ at 6K 17:9 (6144 x 3240) up to 80 fps
  REDCODE HQ, MQ, LQ, and ELQ at 4K 17:9 (4096 x 2160) up to 120 fps
  REDCODE HQ, MQ, LQ, and ELQ at 2K 17:9 (2048 x 1080) up to 240 fps
- REDCODE RAW ACQUISITION FORMATS: 6K 17:9 (6144 x 3240), 2:1, 2.4:1, 16:9. 1:1, and Anamorphic 2x, 1.8x, 1.6x, 1.5x, 1.3x, 1.25x
  5K 17:9 (5120 x 2700) and 16:9
  4K 17:9 (4096 x 2160) and 16:9x
  2K 17:9 (2048 x 1080)
- APPLE PRORES: Dedicated recording in 4K (4096 x 2160) ProRes 4444 XQ up to 60 fps,
  ProRes 4444 up to 80 fps, and ProRes 422 HQ, ProRes 422, and ProRes 422 LT up to 120 fps

GENERAL

- MEDIA: CFexpress Card Type B
- BATTERY: Integrated V-Lock battery interface, optimized for Micro V-Lock Batteries • DC POWER INPUT: 11-17V via 6-pin DC-IN
- DIMENSIONS: 129.37 x 101.26 x 95.26 mm / 5.1 x 4 x 3.8 in (LxWxH, largest fixed dims.)
- WEIGHT: 2.62 lb (without body cap and CFexpress card) • CONSTRUCTION: Aluminum Alloy

FEATURES

- COLOR MANAGEMENT: Image Processing Pipeline (IPP2) supports 33x33x33 3D LUTs and import of CDLs
- AUDIO: Integrated dual channel digital mono microphones, uncompressed, 24-bit 48 kHz • 3.5mm stereo heaphone port
  Integrated dual channel (mic/line/+48V) input via 5-Pin 00B Audio Port, uncompressed, 24-bit 48 kHz
- AUTOFOCUS : Phase Detect and Contrast
- MONITOR OPTIONS: Proprietary Top Accessory Port for Monitoring and Control
  Integrated 2.9" 1440x1440 touchscreen LCD with preview and camera control
  Integrated 12G-SDI with 6G-SDI, 3G-SDI and 1.5G-SDI modes
  12G-SDI: Up to 4096 x 2160 4:2:2 for 60p
  6G-SDI: Up to 4096 x 2160 4:2:2 for 30p
  3G-SDI: Up to 2048 x 1080 4:2:2 for 60p
  1.5G-SDI: Up to 2048 x 1080 4:2:2 for 30p, 24p
  SMPTE Timecode, HANC Metadata, 24-bit 48 kHz Audio
- ADDITIONAL I/O: Tri-Level Genlock Input via 9-Pin EXT; LTC Timecode Input via 9-Pin EXT; RCP2 CTRL via 9-Pin EXT
- IP CONNECTIONS: Wi-Fi (2.4GHz/5GHz) for camera control, video preview, and media offloading
  Ethernet via USB Type-C for camera control, video preview, and media offloading
  MJPEG 1080p live stream accessible through Wi-Fi and USB-C
  PTP for frame level synchronization
  R3D live broadcasting available with RED Connect License and 5Gbps Ethernet Adapter

RED CONTROL & RED CONTROL PRO

- Access full camera controls and live preview from iOS or Android devices.
- PRO APP: Operate one or multiple cameras over an IP connection to synchronize settings, manage media files locally or upload directly to Frame.io, develop custom looks with advanced CDL and LUT controls, and more. Good for control of multi-camera arrays, multi-cam shoots, and live events, all from one central location. • Standard app available from the Apple App Store and Google Play Store.
RED Control Pro available via Apple App store only and requires additional purchase. • RED Control works wirelessly or wired via USB-C

These specs may change or may have errors. Please check latest information at red.com or red.com/komodo-x

Pierre Angénieux Tribute at Cannes to Barry Ackroyd, BSC

Barry Ackroyd, BSC handheld with Aaton Penelope on *Captain Phillips*. Right handgrip is a gear shift from a car. Barry said, "The single handle leaves the left hand free to steady the camera but more importantly free to zoom." Olly Driscoll, Focus Puller, at right. Photo © Jonathan Olley.

May 26, 2023. Barry Ackroyd, BSC was honored with the Pierre Angénieux Tribute at the Cannes Film Festival.

Jon Fauer: What was your first camera?

Barry Ackroyd, BSC: A 16mm Aaton 7. You had to have a camera and lenses if you wanted to work freelance for the BBC. Lacking kit, it would have been difficult to get jobs. But we were considered mavericks. Though clearly, Roger Deakins, Dick Pope, Chris Menges—all these great names were making documentaries. I was just slightly younger than them.

Did you study film?

I attended art school, which was also a film school. Around 1975, at age 21, I directed, shot and edited a documentary about the making of the film *Tommy*, which was made in Portsmouth where I was attending art college. All the equipment was there, provided by the school for free. We had Eclair NPR cameras and, of course, Angénieux zooms.

The 12-120 probably?

Exactly that one.

Where did you grow up?

I grew up in the very industrial part of northern England, a cotton town in Lancashire. It's now part of Greater Manchester. Our town spun 90% of the cotton that came through Britain. Believe it or not, cotton at one point was a third of the gross national product of the British economy.

Of course, that cotton came from America, Egypt, India and so on. It was shipped from all around the world to Liverpool, up the Manchester ship canal, distributed up to Oldham, which did nearly all of the spinning, and then to the other towns that surrounded Manchester. They spun the cotton and then it was mostly exported from Britain.

My grandparents and family all worked in cotton mills. I knew I had to get out. My good fortune was that by the late 1960s and '70s, we'd had a good Labor government that invested in free education. They built many beautiful art schools around the country. And so, when I was failing all the exams in high school, because I was pretty dyslexic, my art teacher urged me to apply to art school. He helped me with the application paperwork. I was only 16. The art school said, "You can come here, but you've got to pass those exams. I took night classes in the adjoining college to catch up. But I kept failing the exams. I ended up doing three years. Your first year at art college is foundation. But I was still young. So they said, "You're basic." And I continued to fail my English

exam another couple of times. Then they said, "Oh well, you may as well stay for another year." S, instead of a one year course, I had three years. My family was supportive.

You had to pass English exams, although you were taking art?

To continue on farther, you needed those exams. I remember passing my sculpture A-levels. I love sculpture and history of art. Ultimately, I think they gave up trying to qualify me in English let me progress. But since then, I've written articles for the BSC magazine when I was president and they were not so bad.

It must have been tough balancing all your work and being president of the BSC?

It started with a few phone calls from our then president, John de Borman, BSC, going, "Barry, you should be on the board. You should be on the board. And within a couple of years, when his term expired, "You should be president. You should be president."

Meanwhile, back at art school...

It started at Rochdale College of Art, which was the next town to where I lived. They taught us every process from embroidery to bronze casting, ceramics, 3D design, painting, calligraphy, sculpture, welding and everything.

Once I finished those three years of my foundation, I wanted to move to another college to do my degree as far away from the north of England as possible. If you saw the place, you'd know why. I got in at Portsmouth, a small fine-arts college on the south coast of England. Suddenly these doors opened for me. By then, I knew that I loved cinema. As a younger kid I'd watched Andrzej Wajda's *Kanal* and Ken Loach's *Kes*. Those were films that inspired me.

What was it like growing up in Oldham?

It was gray and black because there was so much coal burning from the factories. I got to watch many films late at night, especially on BBC Two. We grew up in this big industrial landscape. As kids, we played in old factories that were decaying, with dangerous holes in the ground and coming to the end of producing textiles. There had been over 300 factories in 100 years of production. It was crazy: you brought cotton to Manchester and then exported it back to India. So crazy. There was an engineering factory, Platt Brothers of Oldham, that made the noisy and fabulous cotton machinery in our town. I was a camera assistant after leaving college for a series of documentary films on China. We were the first people allowed in from Europe. When we were in Shanghai, we visited a cotton mill. It had the familiar smell of cotton and oil, with the sound of moving engines. I went straight up to the machinery and just looked along the line. And it said, "Platts Brothers of Oldham." It'd all been exported out.

Did anybody teach cinematography in art college?

Yes, we had great tutors. Walter Lassally, BSC came down, I remember. But once I'd picked up a camera, I got the love of it. That's the thing. At first, there's a fear of doing something wrong. You have to get over that. When we started to make documentaries, although we had limited film stock all the time, we developed a bit of an attitude to just carry on — shoot, shoot and shoot. Don't miss anything. We were using 16mm film, which was very precious and expensive. But we still did it—shoot, shoot and shoot. Fortunately, we were backed by all the tutors to keep shooting.

What was your break into the business?

We made an 80 minute feature. Bob Ede, one of our classmates, wrote a feature script in his final year. He got money from the local arts council and his home town. He blagged a few people to put a little bit of money in. We got film stock and we had all our camera gear. We rented a dolly. Bob asked me to shoot it. I had never done anything so ambitious before. So, I shot this feature. It got shown, had a bit of distribution and was successful. It was his childhood story. Bob was great.

What was your first next job in film?

I moved to London. One of the tutors gave me a set of keys and said, "You got to get out of this town, take these keys, go to this address in the center of London, just tell them that Chris says you can have his room." So, I arrive at the place in Theobalds Road. It was occupied by a lot of people who came and went and crashed there for a few days. There were four or five bedrooms. It was infested with mice. You can imagine a lot of people there. The crazy thing was having only one phone that was shared by everyone. Imagine trying to get your first job with only one phone and so many people. Try explaining that to someone today. There were no mobile phones back then. There was no internet. You couldn't even get in contact with someone. You had to trust that one of these crazy people who were endlessly coming and going through the flat would write down the number and remember to tell you that someone called.

I couldn't get into the union. It was a closed shop. It was hard to find new connections. I tried to apply to the National Film School, but I didn't get in, which was great because I'd already done six years studying. I didn't want to do another three.

One day, there was a phone call for me and someone wrote down the number. I ran down to the street to get on the pay phone. I had been recommended for a job by Judy Freeman who studied with me in school. It was to go to Belfast in 1977 or '78, to do a BBC documentary about The Troubles. Of the 50 BBC film units that existed at BBC Ealing, they couldn't find anyone who would volunteer to go. The next thing I knew, I was flying into Belfast and right into the middle of The Troubles as a camera assistant.

I returned to Belfast many times. And I did those kinds of jobs for four or five years, because you fall into this beautiful trap of being busy. Then I started doing a little bit of corporate stuff, and Channel 4 was coming on stream, which was a big change to our TV network system with smarter, clear ideas. Then, I did a lot of music videos, working as an assistant with Roger Deakins and others.

Then the jobs got more and more interesting. By the time I finished documentaries, I'd been in 50 different countries. America lots of times.

Loading and pulling focus?

Yes. And I still pull focus as a DP much of the time, still shooting documentary style with those beautiful Angénieux zooms. I do the Zoom and the Stop [iris] with my left hand. And I do the Focus if I can. The left hand to me is the jazz; it is the focus and zoom.

What was the first major project you got to shoot as DP?

I'd been working on a film with an independent still photographer, Andrew Maclear. He was one of the "in crowd," photo-

Barry Ackroyd, BSC on *The Old Guard*, Photo: Eli Joshua Adé

graphing the Beatles and the Rolling Stones. One day, Andrew said, "Now I'm going to make a film about Randy Newman who's going to tour Europe."

Andrew made the film by paying for everything with his American Express card. I can see how, now that I know how much he must have earned as a still photographer back in those days. Not everyone got paid brilliantly, but he was. We followed Randy Newman around Amsterdam, Paris, Belgium, London and elsewhere. We got some really good images. Then we went to LA and followed him around there. But, the trouble was, if you made an independent documentary, you could only sell it for practically nothing. But, these were also the days of MTV and lot of music videos, so we were kept very busy.

You worked freelance at that time?

All freelance. All the good jobs were done by freelancers. The directors would not want to be working with the BBC crew, and that's horrible to say, but they were very institutionalized in the fact that they had the permanent jobs, they had their holiday pay and their holiday schedules all worked out, and their pensions and the mortgages paid for, and all that.

We were all the freelancers, really gung-ho. I remember when I first met Dick Pope and Mike Metcalfe, running around backstage at concerts with big bands and making music videos. They were so cool. But, when I got into the music video thing, I realized that I'd rather be back doing documentaries.

So, I carried on with documentaries. The list of documentaries that's on my CV is just a small selection. I've done hundreds them. We were the first to go into Star City in Moscow and film a three-part series. I worked with Nick Broomfield, a famous documentary filmmaker. We did a couple of films in South Africa. One is a classic film of his called *The Leader, The Driver and The Driver's Wife* about the Afrikaner Resistance Movement, AWB. We also followed Margaret Thatcher on a book tour of America.

You must have crossed paths with Chris Menges, BSC, ASC?

I met Chris through Judy Menges, formerly Judy Freeman, who was working with him on documentaries. Chris signed my papers and got me into the union. I have called him my mentor and I still stay in touch with him.

Chris and Judy have been very influential in my life. It was Chris who got me started with Ken Loach. By that time, I'd done all kinds of documentaries and a feature. But Ken, obviously, didn't want someone who came with a lot of "This is how I make films, this is my style, this is what I do." He wanted a clean slate and I was a clean sheet. I guess I was also politically aligned with how Chris and Ken thought, having lived through the '70s. We were all political, with demonstrations, marches and all the rest of it.

It was Chris who put me there in the frame to work with Ken Loach. Ken started me off with a couple of little documentary things that set me up to make sure I understood how he liked to work. We had a conversation about style. It went mostly like this [Barry acts out shooting handheld documentary style] with Ken saying, "Isn't that the right headroom? A little bit more, don't you think? Yeah? And when you do a pan, you think golden ratio and you stop and they exit on the back third of the frame, you don't follow them too far, you don't let them out frame, take it to the doorway and you let them exit the door."

That's an example of Ken Loach directing?

Yes. Ken put all that in my head and then we set off making films. The first one I did with him was *Riff-Raff*. It turned out to be really good, went to Cannes, ignited Ken's career again, and it was an amazing film to make. For me, *Riff-Raff*, *Raining Stones* and

Ladybird, Ladybird were all like school. I was learning. Ken would say, "Don't you think this is where we'd put the camera?" I'd reply, "Yeah, okay."

He was so interested in camera placement?

Yes, he knew exactly where the camera should go. He would say he learned so much from Chris Menges. He has a distinct idea of how to make films. Ken is very classically minded—framing, proportion, lens size are all very critical to him. That's what I learned.

Can we digress? You are receiving the Pierre Angénieux Cinematography Award at Cannes. Ironically, Cannes is very much about directors, actors and auteurs. You mentioned that you grew up on the French New Wave, but the curious thing about the French New Wave was the auteur theory. How is the auteur theory still valid when film is such a collaborative effort?

It was my dissertation when I was at art college. The idea of an auteur is great, but film production is a collective. It very much is a collaboration of people. Inside that collective is a hierarchy. Let's remember that cinematography is the only art form in cinema that is unique. Editing is the sister to it, or brother. If there were no moving image, if cinematography hadn't come about, you'd still be performing plays and radio shows. The camera and lens are the crucial things. Whether it comes from Hollywood or out of the auteur theory, cinematography is still considered a minor art form. In fact, it's not even looked on as an art form by some people, by some film critics.

Why is that?

Cinematography is a minor part in some minds at Cannes, for instance. There's a lot of respect on the set, there's a lot of respect from the directors with whom you work over and over again. But then they draw a line. Literally, you are below the line. You might say, "Well, the contribution I made is greater than the still photographer who gets residual payments and can show their art because it's considered an art." At least in Europe, still photography is classified as an art form. Cinematography isn't. I'd love to bring all this up more often. I'd love for it to change.

Let's talk a bit more about art. Considering technique and technology, how do cameras and lenses influence style and the other way around? Did you start with a camera that influenced your style?

It was an Eclair NPR camera. Mind you, Chris Menges also loved the NPR camera. It had a flat back; you could go handheld and lean it against the wall. I only knew how to make films with handheld cameras. By that, I mean 16mm, lightweight cameras with an Angénieux lens on the front of it. Those were all the tools you needed. That was the French-European progression through Eclair and then Aaton. In America, it was Leacock, Pennebaker and Drew with their modified Auricon cameras, stripping them down, making them lighter. These were two different ways of coming at the same style in our industry.

As a Cinematographer, you have to remember that you're not the first; there are other people doing the same thing. When I did the Jason Bourne film, Paul Greengrass asked me write something for Universal to explain what style we were going to do. I added a quote from Robert Drew, father of American reality filmmaking (Direct Cinema, cinéma vérité) about avoiding the dolly, the tripod, the crane—just shoot, shoot and shoot.

I don't think it's quite as simple as that, but it's not bad to keep that in the back of your mind. You should have a good camera, a flexible camera. I never worked with big box cameras. I like lightweight cameras. We had to start shooting Ken Loach's films in 16mm and Super16. When it came to *Land and Freedom*, they wanted it to be shot in 35mm. That's when I moved to the Moviecam, which was the most versatile camera at the time. Ken would have you in the back of the room. Where are you going to put the camera? You're in a closet, at the back of the room, facing the windows. And then your complimentary shot would be on the other side of the room tucked into the corner there. You had to have everything as small as possible and those cameras were best for that. But I never progressed onto anything bigger. Anything that was in studio, when they said studio camera, I kind of shuddered inside, thinking, "Now, you're tying me down."

I've just been in America doing *The Sympathizer* with Robert Downey, Jr. for HBO. You walk onto the set, the dollies and cranes are all there, piled up in the middle of the room. You ask for a dolly shot. They leave a yard of gap between you and the wall. I ask, "Why are we wasting all this space? Why don't we just make it a bit more uncomfortable for ourselves?" And they say, "Why would you do that?" I reply, "Because you can put the camera farther back and instead of a 35mm lens, you could use a 40mm or 50mm—it would be a nicer shot and it will look little less wide angle."

But there's no room for the dolly grip up against the wall.

I like to keep it light. I'm the one who jumps in the back of the car and does the over-the-shoulder shots, and I'll find a low angle shot and I'll do the handheld shots myself.

What camera did you use on *The Sympathizer*?

We used the new ALEXA 35. Which is nice because I can use the Angénieux 24-290 Super35 zoom rather than the bigger, "grown-up" Optimo Ultra 12x 36-435mm T4.2 Zoom in Full Frame mode which is longer and heavier. When I have the 24-290, it feels like the documentary camera that we had when I was at art school. Your fingers can roll across the zoom from wide to close.

Do you still zoom by hand?

Yes.

Not even a zoom motor?

Definitely not a zoom motor. If I work with new crew, I have to begin by asking, "Let's not put that zoom motor on, you don't have to worry about that." I ask them to leave off the handle bars that spread your hands way out to the side like wings. [Barry goes through the motions of his handheld style—elbows tucked into his waist for stability.] I have my own handgrip on the camera right side. It's modified from a gear shift of a car and it's flexible. I put that on the bars, just on the right side. You hook your arm in, you hold the camera there, that's exactly how it's meant to be. You keep looking through the eyepiece; don't use a monitor. Now you're at the focal plane. I mean, there's a reason for all of this and how it works.

So, the camera's to your eye, scanning the scene. Your other eye is looking around to see what's coming in from the side. I've got my left hand on the lens, doing the zoom. I've got my thumb on the stop [aperture ring]. Documentaries informed all of that, running

Barry Ackroyd on slider and 24-290 on *The Outlaw King*. Photo © Mark Mainz.

around Cambodia in the jungle. You don't have an assistant to come and pull focus for you. You're there, you've got your finger on the zoom, you can crash in, find focus, pull out again, and make it look elegant. That style became popular in commercials, and that's how I transferred to doing commercials and features.

Now, it's a camera body like the ALEXA 35 with the long Angénieux zoom on a three-foot slider. Maybe it's on a dolly or maybe it's on boxes on the ground. Looking through the eyepiece, there I am. I've got my hand on the zoom. It's your eye, it's your brain. I enjoy being behind the camera to pick up the imagery that tells the story. It's emotional, it's sculptural.

You're still operating, I assume?

I've always operated, on every film I've ever done. When I went to LA this time, the union came back and said, "No, you're not allowed to operate." And I go, "Well..." And then they said, "Can you tell us why you want to operate?" And I just said, "Here's my list of films. Maybe you've seen one of those. I've been brought out here especially for this one episode because I have a thing that I do, and that thing involves me being behind the camera. Of course, we can employ two other operators, so I'm not stealing anything from anyone."

And then you pass on your skills to the other operators and focus pullers, the first ACs. Sometimes they'll say, "I've seen your films and I don't know if I can do that." I'm like, "You can. The only way you can fail is to not try. If you fall out of focus, you can bring it back in, especially now you've got all those new tools."

You usually had a focus puller once you started doing features?

Yes. And that was a big step forward. On documentaries, you're trying to do everything all at once. You're trying to keep up with the story, you might be loading magazines on the run. Sometimes it was literally on the run. I remember assisting for Dick Pope, trying to grab the focus knob, running backwards through a field with Maasai women. Part of the job, when you went to all these places, was "Where do we get our water from? Who's going to clean the filters? And can you cook anything?" It was lots of fun.

You mentioned the 24-290 on a slider. What head do you use?

I use the OConnor fluid head. I'm rarely on wheels except for the occasional remote head on a crane shot.

Do you use the shorter Angénieux Optimo zooms for hand-held work?

Yes. We use the 15-40 and the 28-76 lightweight Super35 Optimo zooms.

Do you ever use primes?

Yes. We always order them. They're always there. They usually just sit there in the camera truck for three months on a film. When it comes down to it, usually there are two or three cameras and you want them to be absolutely complementary.

Documentary style with three cameras?

Here's an example. We shot with three cameras recently, and you called them "A", "B," and "C." And I go, "I'll be C then." "A" Camera can get the tracking shot. Sarah on "B" camera has a complementary angle. Then they ask, "Where are you going to be, Barry?" I say, "I don't know yet, just a minute. I'll just check the lighting

so please put my camera over there with the long zoom, with the Optimo." I just call it the Optimo. When it's all ready, they ask, "Shall we do a rehearsal?"

"No," I say, "Let's just shoot it."

Shoot the rehearsal.

Some directors, Paul Greengrass, Kathryn Bigelow, Adam McKay and Jay Roach, all those people were saying, "Come on guys, let's just shoot the rehearsal."

The actors like it. I've worked a lot with Charlize Theron and you might imagine her to be someone who's very Hollywood-ish. But she enjoyed it. Robert Downey Jr. loved it straight away, as did Tom Hanks.

On *Hurt Locker*, why did you decide to shoot in 16mm rather than 35mm?

I got a call from Kathryn Bigelow. She liked *United 93* and I had just finished *Battle in Seattle*, directed by Stuart Townsend. Charlize Theron and a lot of very good young actors, who are now big in Hollywood, were in it. It's about the protests in Seattle during the WTO Conference in 1999. The budget, style and the look wanted to be 16mm. It was quite easy to convince Stuart and everybody about that.

It was just after that when I got this phone call from Kathryn and as she's describing what she wanted to do, I said, "You're talking 16mm here." She replied, "That's exactly right, you said the right thing, I want to do it that way."

It's not necessarily about a particular style or whatever. It was to move quickly and be in the moment. That film did very well, and you couldn't tell it was 16mm because it was appropriate. With bigger cameras, we would have been restricted.

What cameras were they?

They were all Aaton Xtera cameras, the final version, with the best video assist that we had at the time. But poor Kathryn had to watch four cameras on a very poor monitor. We had four cameras running and we kind of danced around each other. Everyone had zoom lenses. We all stepped back a little bit, and found the shots.

What did you have on *Captain Phillips*?

Captain Phillips is an interesting one. It was 16mm and 35mm. I think it's the last film I shot on film. I'd worked with Paul Greengrass before. In prep, he began by saying, "Here, this is what I'm going to do." And I wondered, "How do we do that?"

We looked around the world and got news that the Alexander Maersk, a sister ship of the Maersk Alabama, was going to be in the Mediterranean, and would be in Malta. I knew that we going to be filming in the water at high speed in these little rubber dinghies called RHIBs (Rigid Hull Inflatable Boats) chasing a real live container ship.

We attached a little scaffold tube rig at the back of the RHIB with a short bungee to hang the camera on. And then you need a camera with a long zoom lens. The camera sits on your shoulder, with a rain deflector added on, supported by the bungee to take the weight off, but it's still going to feel like you're in the boat. I was at 12mm at the wide end of the 16mm zoom when the pirates are up close. I can see what they're doing. And then they go and board the Alabama which is physically in front of us. You can push the zoom in. And then zoom back out to the guys in the boat, with spray coming up over the camera. We had rain deflectors.

The obvious thing to me at that time was that it had to be 16mm. The logic of the script was to just cover everything that happened with the Somali pirates in 16mm until they climb that ladder and they're on the big container ship. Then it's back to 35mm. It was a conceptual thing as well to say it's a slicker, more defined world of Western Europe and America compared to what was happening in the Somali Village.

What camera did you use for the 35mm scenes?

Aaton Penelope and others.

It's interesting—current digital cameras are not as ergonomic as those handheld film cameras?

They're all boxes. And now, with so much stuff hanging off the side of them, the camera fades from view pretty quickly. I'm going to go handhold. The assistants ask, "Do you want a pad for your shoulder?" No. The camera should be designed to be there, directly on my shoulder, without hurting."

Gabriel Bauer, inventor of Moviecam, said, tongue in cheek, that a camera's just a box onto which you put good lenses.

The lens is the key, isn't it? The lens is the most important. It's our eye. It's the magic. I've got to say, the zoom lenses gave me my expression. How I see the world is not in a fixed lens. It's in sculptural, three-dimensional movement and repositioning. When someone says something very interesting, I only see a part of the face. When a group of people get together, I see the room. I don't want to stop to change lenses to do that. I want to make it fluid and sculptural and that's become my signature. It's what I do. I always tell students to try and find some kind of signature. It may be a borrowed piece from someone else, but it is the path to a signature. Great cinematographers have this signature style. When Chris Menges walked around with a handheld camera, it was his camera work I was in awe of, as well as the story and the way it was told.

A rhetorical question: if you're handheld on a prime lens, could you not easily move in onto an actor, or move back? What is the advantage of being able to zoom in and out?

Because the thing that influenced me in the British style of documentaries, and the Ken Loach style of shooting, was to be fixed on a subject. You'd probably want to lean against the wall. The sound recordist—and there were some great ones, fantastic people—would be going in with their Nagra recorder and Sennheiser shotgun mike or sometimes a boom. They would wander around, discreetly, go up to the subject and then look at you because you probably can't hear it so well. You roll camera from your position against the wall, and push in on the zoom. Then you might reposition to get closer and then a little bit closer. But we never walked into someone's face.

That came about when the small digital cameras came out and there was one person who became producer, director, camera operator and sound recordist. They had to stand right up close because they were listening and shooting. They had to shoot on wide lenses because they couldn't focus—they could only point. What's cinematic about using a long zoom lens is the audience is

Barry Ackroyd on *Detroit*. Photo © Francois Duhamel.

drawn in, in a special way. They're not in the group with them. You are out of the group, but you are the observer. You're an observer and you're so intently drawn into it that you feel that you witnessed it.

When I'm shooting, if I don't feel the reality of it, it's not working. It's about putting yourself in the right place. That's difficult sometimes because it can be very staged. I just want people to think that it really did happen. *Hurt Locker* is a brilliant example. This is what Kathryn taught me as well. We were able to cover multiple actions with multiple cameras and have different perspectives and then cut them together. Before that, I was mostly shooting with a single camera, documentary style. Obviously, I had experimented with that on other films as well. But a great director makes for great cinematography.

You have been an advocate of proper working conditions on set.

I don't want people to work excessive hours. A cinematographer can help control the rhythm on set. It should be good for lives and family. But you still have to provide the right look for the film and an interpretation of the story for the director. You're working. I said earlier how the cinematographer is so important, but you're working for a director. What I want do is to surprise them. For example, on *The Old Guard 2*, Charlize Theron said, "Barry, come on, you've got to do this. I need you to come and do this." We started working together on *Battle for Seattle* and I've done some good films and some not so good films with her as well. *Bombshell* was good.

Bombshell was great. I really loved working on it. I thought Jay Roach was absolutely brilliant to work with. The crew, the design, everybody. We managed to reproduce the Fox News offices. When you think about a news organization, everybody thinks of "All the President's Men." Hanging lights going on forever. And giving fantastic weight to the story.

On *Bombshell*, we ended up in the bottom of the LA Times building in a crummy office that had some recessed fixtures that couldn't be ripped out because of all the wiring. In the end, we just had the hardware store deliver a bunch of 2-foot by 2-foot and 2-foot by 4-foot inexpensive LED panels. The color temperature wasn't great, but we had to fill the entire room. I think we called them "8.99 lights" because that's what they cost at the hardware store. We just put them up on the ceiling and lined them up as best we could. You adjust the color temperature in the camera, and add color correction gels to any additional lights.

The way we controlled it was with what we call "teabags." We had loops of material to hang below the ceiling panels around the area where we had Margot Robbie, Charlize Theron, Nicole Kidman and many other incredibly beautiful actors. We wanted to make it slightly softer, to take the edge off.

Did you have lights on the floor as well?

Occasionally. But when you start to work with multiple cameras, the stands get in the way and you end up taking them away and just working from overhead.

Do you usually try for a documentary style, available-light look?

Yes. As Ken Loach said, the best thing in documentary is usually switching off the lights when you walk into a room.

Ken didn't want light inside the room. He didn't want it to be seen as a thing. On the first week of *Riff-Raff*, we shot a scene in a big room at a building site. It had some scaffolding outside. In the morning, we had some sunlight that came in and gave it that nice little lift. Over lunch, I thought, okay, well Ken's away, let's just bring in a little 2K and add a little bounce there on the floor.

The first thing Ken said when he walked into the room was, "Ooh, ah, ooh. Don't you think the actors might... Ooh." I quickly said, "Take it away, take it away." That's how Ken taught people. That's how he would get actors to do the things that he wanted as well as things that were completely his idea. To the actors, he would just say, "Mm-hmm. Mm-hmm. Very good, very good. Wouldn't you sit? No, no, no. Very good. We'll do it again. Do it again." And, of course, then the actor says, "I'm going to go sit over there."

When you're lighting beautiful actors, you probably prefer beauty lighting?

If I can get away with it, I will. I like the Kino Flo 4-foot 4Bank fixtures. Usually whenever you get to do some testing, that's when you do a little bit of beauty lighting because you want the studio people, who are going to look at it, to say, "Oh, that looks like he knows what he's doing." And then I go off on our own tangent. Go shoot and shoot and shoot. Nothing's going to stop us. As I said, Charlize Theron and other directors like it.

Do you use filters?

Sometimes I want a little softness with these digital cameras. I'll add a little Tiffen Glimmerglass just to soften it a bit. But I don't like fiddling with the camera.

Do you prefer lenses that are softer or pristine?

Well, do we see things pristinely? I think we see things through a glass darkly. We see it vague.

Okay, these are the tools that I think are the best in film. It's the lens, the exposure, the focal length you choose, and the depth of field that you can give it. People are now very keen on using wide lenses wide open at T1.5 or whatever, being wide and close, and 30 degrees higher than the subject, softly lit. But you're so close, it's got to be cross-lit. And then you've got no depth of focus behind. You could help that by stepping back, don't waste that space and put a longer lens on. Then you're in control of depth of field. I don't think it isn't as beautiful. I just think it's appropriate. And I think appropriate is probably better than beautiful. When it comes to making a film, you are better off considering the whole subject rather than just the cinematographer's perspective on it.

I'd like to invent something new. I think I helped Ken Loach move forward a little bit. I think *Big Short* was especially good, because it was not the kind of film you might have expected. And *Bombshell*. Also a couple of other films, even smaller, independent ones.

What did you especially like about *Big Short* and *Bombshell*?

Adam McKay called me directly. I was in Australia on holiday. We chatted a bit, like we're doing now. He said, "I really liked *United 93*. I liked how crisp that was." I didn't see it as being crisp. He mentioned all kinds of things that I didn't see in it myself, the kinds of things he wanted to apply to tell the story he needed. He wanted to add something—life, movement, simple things. He said, up until that point, his films were lock-off shots with two comedians, telling jokes to each other. He'd sit there on set, on a microphone, adding a few lines like, "Say this to him now. Go on, say that..." He just liked playing around.

But I think we found something that expressed it. Also it had very good editing that added all those layers.

And *Bombshell*?

It was allowing the scenes to run and play out. I think it was also because both those directors just encourage you to do what you do. When they see it, they say, in a very subtle way, "Yes" or "No", or "That's it" or whatever.

The first time I worked with Paul Greengrass was on *United 93*. I'd offered up an idea that we could shoot continuously, like a documentary. You're in the scene, you would keep running, especially with a 16mm Aaton camera. And even when you ran out of film, you just swapped the film magazines, put the new one on. You missed 15 or 20 seconds at most, but then you'd keep shooting. But we had to shoot on 35mm. I had ZEISS Variable Primes, Angénieux zooms, some wide lenses, and two cameras. We staggered the cameras so there would be overlaps during magazine changes. I kind of suggested that, not knowing that we were going to be in an airplane cabin on a big gimbal, being thrown around on the plane, in a studio. I did some shots with the long-range Angénieux 24-290 on a monopod resting on my shoulder while we're being thrown around, because I wanted to get that long lens feel to it. But it was hard work. The story was film length. It was 90 minutes of events. We wanted it to feel like it just happened. That was special, that film. That is a massive feat of energy and sheer perseverance.

This has been fascinating.

I hope I didn't ramble on too much.

No, rambling is much more interesting. You're very articulate and interesting. Thank you.

I've got some great stories. When I was on *Old Guard 2*, I kept the producers up in the evenings sitting around, telling stories. They said, "Write a book. Write a book."

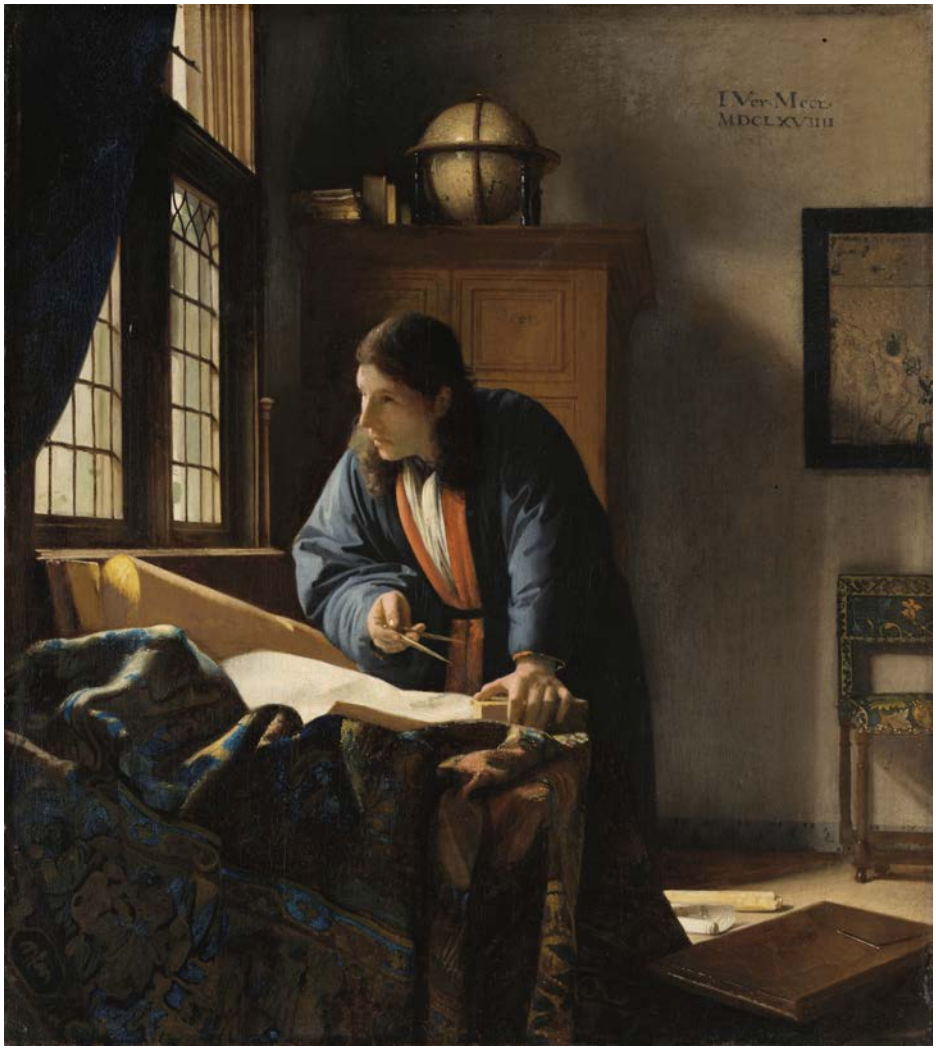
You should. "The Life of Barry."

It's the greatest job ever, isn't it? After art college, it was a dream to travel to 60 countries and film the most interesting documentaries. You went because it was interesting. And now you make films because they're good scripts, and they've got great actors. You meet people, and they're all ordinary people. I've been lucky. Directors have been wonderful. And crew are great, the same all over the world. We're a type, but a good type, and surround ourselves with good people and get paid for it. It's amazing.

It beats working for a living, right?

Yes, definitely. But residual payments for cinematographers would help. Anyway, that's another story.

Preston All-Points Lens Mapping



If you were the captain of a Dutch East India Company (VOC) ship sailing on stormy seas, accurate maps were essential to survival and arrival at your destination. Often, it was destination unknown. Much of the world was still uncharted. The Northwest passage to spice islands was a dream and a blank. Charts were often inaccurate. One false waypoint, and your ship might run aground or be shredded by hidden rocks and reefs.

Geographers and map-makers in the Dutch Golden Age worked at an intersection of art, science, commerce, engraving and publishing. They were in great demand.

These vintage maps, like vintage lenses today, required careful updates as new routes were discovered and new waypoints found.

Another industry flourished in the Netherlands of the 17th century—optics, grinding optical elements and manufacturing lenses.

Although vintage cine lenses are decidedly not four centuries old, the two disciplines of lenses and mapping converge today, as Howard Preston explains Preston Cinema Systems' new All-Points Lens Mapping.

Read on.

above: Johannes Vermeer *The Geographer*
1668. Oil on canvas
53 x 46.6 cm (20.8 x 18.3 in.
Städel Museum, Frankfurt

left: Frederik De Wit, 1660 map.
Nova Totius Terrarum Orbis Tabula.
Amsterdam: Frederick de Wit in de Calverstraet in de Witte Paskaert.
Library of Congress.

Preston All-Points Lens Mapping

by Howard Preston, President of Preston Cinema Systems

1. Introducing All-Points Lens Mapping

Accurately setting the focus distance of a lens should be simple. The reality is more complicated.

Unless the desired focus distance is one engraved on the focus barrel, the distance setting must be estimated. This estimation, called interpolation, can be accomplished if the focus calibrations fall on a simple smooth curve when plotted against focus ring rotation.

This focus curve is key to accurately setting focus. Preston HU3 and HU4 hand units calculate the focus curve for each lens to enable interpolation between the calibrations on the focus ring.

If the lens focus calibrations follow a smooth curve the standard 10-point focus calibrations allow for high accuracy focus mapping. If that's not the case, new All-Points Focus Calibration, only available with the HU4, should be used. Two examples illustrate each case.

2. Contemporary Cinema Lens

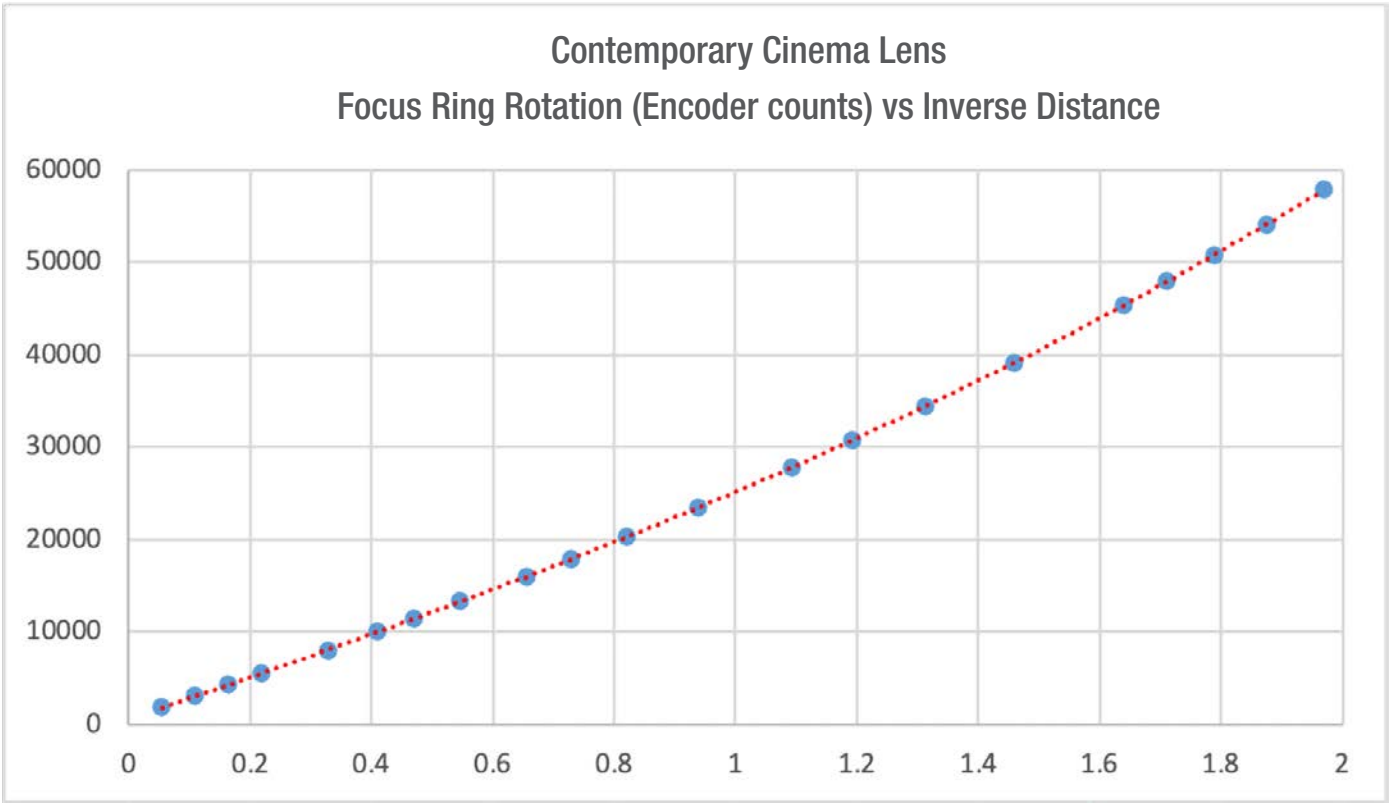
The graph below shows the red focus curve representing the focus calibrations of a contemporary cinema lens. The distance calibrations are shown as blue dots on the graph.

For this example, the blue dots lie on the red dashed line with an accuracy of better than 0.1%. The focus curve gives the correct rotation angle not only for the calibration distances, but for all of the distances in-between.

Preston HU4 Focus-Iris-Zoom Hand Unit

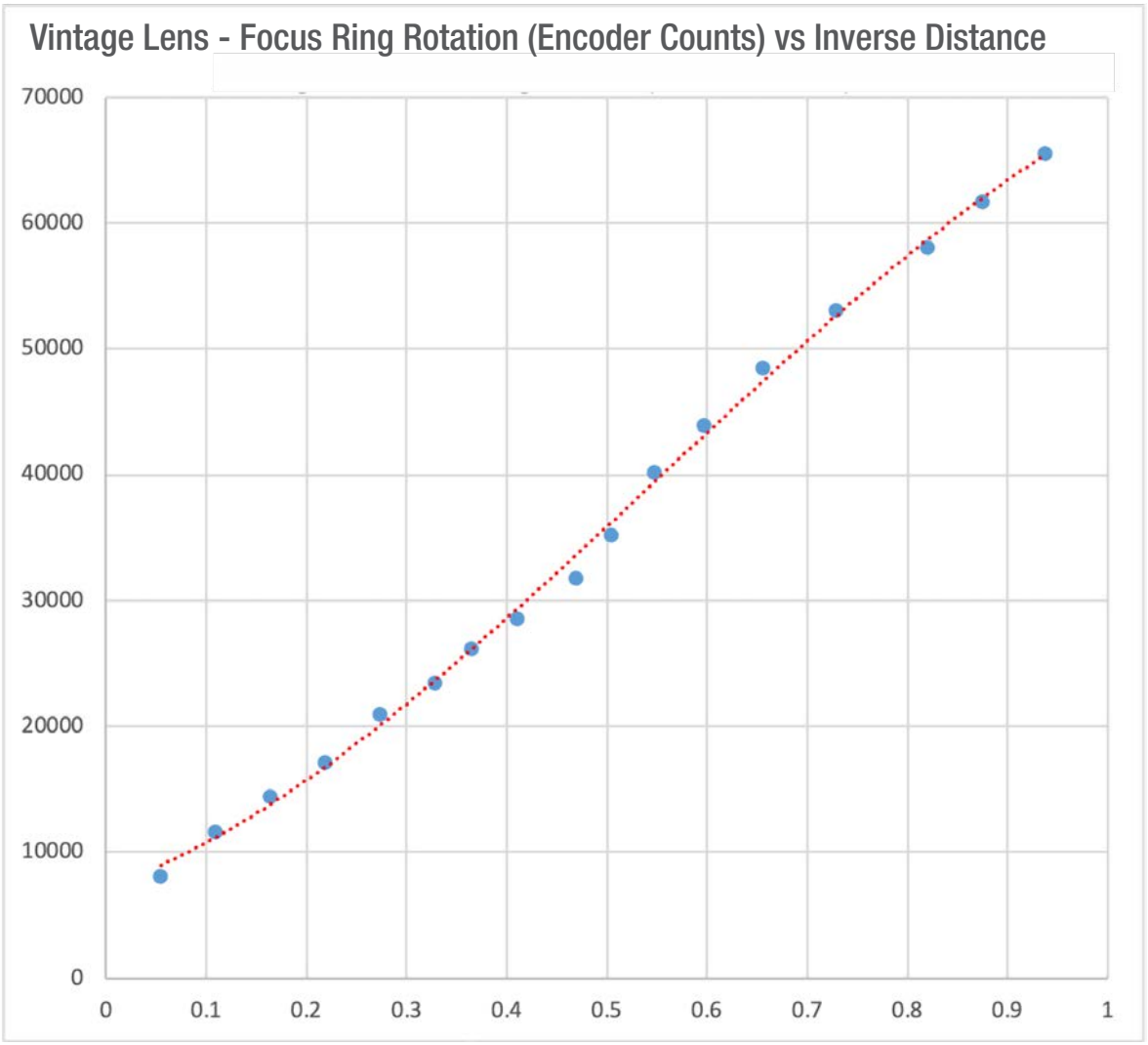
When the focus curve fits the lens calibrations with high accuracy, lens mapping with the standard 10-points calibration will provide matching accuracy—so when a distance is set on the hand unit focus knob, it will exactly match that on the lens focus ring.

The majority of modern, high end cine lenses have focus accuracy similar to this example and allow highly accurate focus mapping with the standard 10-points calibration.



X: Inverse distance in meters, 0 = infinity; 2= ½ meter.
Y: Preston motor and Hand Control encoder counts.

Preston All-Points Lens Mapping



X: Inverse distance in meters,
0 = infinity
2= ½ meter.

Y: Preston motor and Hand Control encoder counts.

3. Vintage Cinema Lens

In contrast to the contemporary cinema lens, the graph above shows data from a vintage cinema lens.

The Focus Calibration points in the graph bounce below and above the red focus curve; many dots don't even contact the focus curve. Those dots that don't touch the focus curve represent an error of at least 1.5%, **which is about 7 times worse than the maximum acceptable error of 0.2%.**

It's not necessarily that the vintage lens is optically deficient. Wear and tear may have degraded focus cams and cam followers or helical threads. Shipping and dropping may have loosened an element.

At right: Howard Preston with a vintage Debrie mechanical remote follow focus hand unit in La Cinémathèque Française equipment collection.

Preston All-Points Lens Mapping

4. HU4 firmware update HU4-2.000

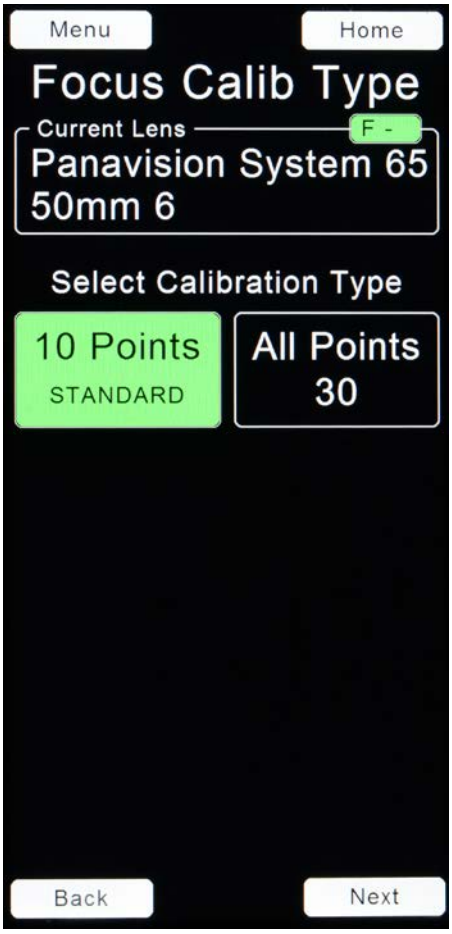
To accommodate lenses such as the vintage lens described on the previous pages, the Preston HU4 firmware update HU4-2.000 adds All-Point Focus Calibration.

With All-Points Calibration, all marked focus distances on the lens ring are used for calibration so that all focus distances on the lens are exactly matched on the HU4 display and focus ring.

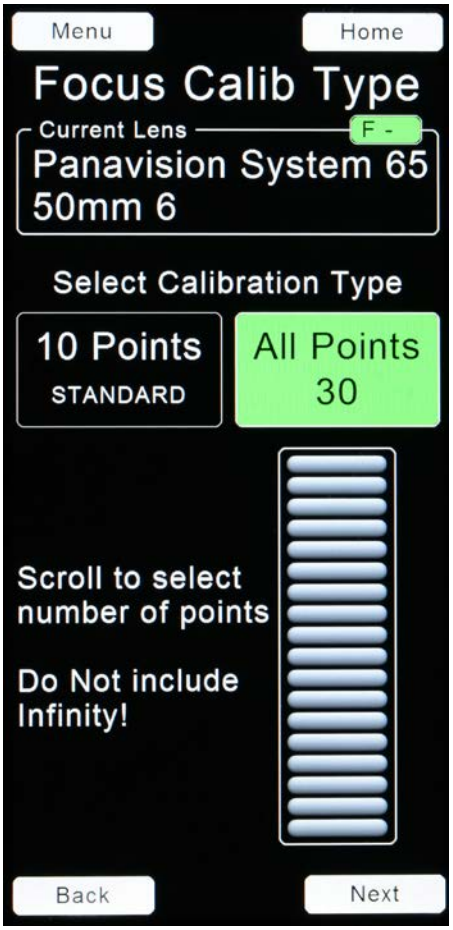
Even with All-Points Calibration, distances between the focus calibrations must still be interpolated and focus accuracy will only be as good as the combined accuracy of lens calibration and interpolation.

Remember, the focus chart is your friend.

5. Focus Calibration Page on Preston HU4



5a. The Focus Calibration page on the HU4 running on the new firmware now gives the user the choice of 10-points Standard Calibration (above, left) or All-Points.



5b. When All- Points is chosen (above, center), the scroll wheel is used to enter the number of distances engraved on the focus ring. Do not include infinity in the count.

5c. Lenses calibrated with All-Points are identified with an underlined F (above, right).

6. New Preston Firmware Updates

The new firmware updates supporting All-Points Focus Calibration are:

- MDR3 1.148
- MDR4 1.065
- DXL 1.029
- HU4 2.000

If the HU4 is using a lens record created with All-Points Focus Calibration with an MDR running a previous firmware version, the lens can be controlled normally, but LR2 and video overlay functionality will not be supported. *prestoncinema.com*

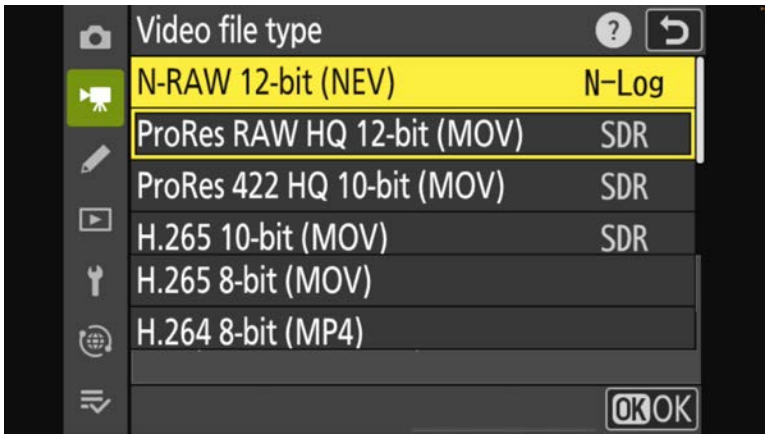
Nikon Z 8 Cine & Stills

If you loved the Nikon Z 9 but wished for a lighter, smaller Full Frame mirrorless hybrid still/video camera, Nikon now has the new Z 8. Nikon is definitely focused on cine as well as stills—the Z 8 records RAW internally: 12-bit N-RAW up to 8K 60p and ProRes RAW up to 4K 60p.

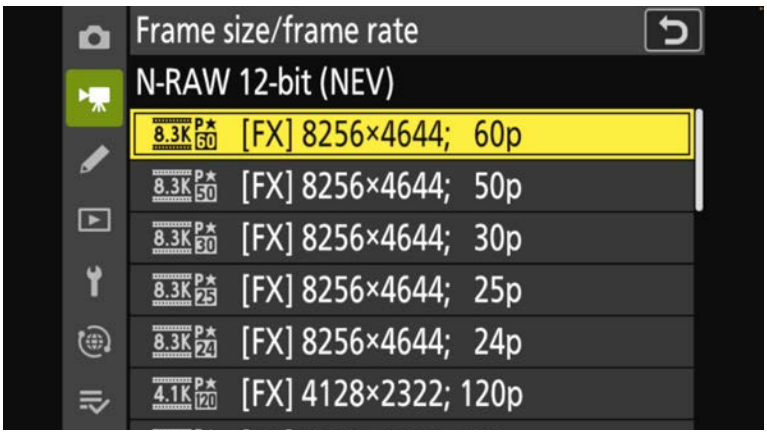
There are so many impressive things about this new camera that exclamation marks should be here in place of bullet points.

Cine (Movie)

- 52.37 million total pixels; 45.7 million effective pixels.
- Up to 8K60p (N-RAW) and 8K30p
- FX (Full Frame) Stacked CMOS BSI Sensor, 35.9 x 23.9 mm



Record N-RAW 12-bit and ProRes RAW video to internal CFexpress.



Record N-RAW 8K 8235x4644 up to 60 fps.

- Z 8 is roughly 30% smaller than the Nikon Z 9, and 15% smaller than the Nikon D850.
- Nikon EXPEED 7 image processor provides a scan rate so fast that no mechanical shutter is needed.
- Almost no rolling shutter artifacts.
- Approx. Size: 144 x 118.5 x 83 mm (5.7 x 4.7 x 3.3 in.).
- Approx Weight: 820 g/1 lb. 13 oz. (camera body only).
- Cine features include: Red REC Frame Indicator, focus peaking, zebras, waveform, linear focus capability on many NIKKOR Z lenses, fine ISO control, Customizable AF speed tracking, timecode sync, 24-bit stereo audio, etc..
- Record up to 125 min 4K UHD/60p. 90 min 8K UHD/30p.
- Movie ISO: 64 to 25600.
- Movie file formats: NEV, MOV, MP4.
  N-RAW (12 bit), Apple ProRes RAW HQ (12 bit),
  Apple ProRes 422 HQ (10 bit), H.265/HEVC (8 bit/10 bit),
  H.264/AVC (8 bit)
- Resolution and frame rates:
  8256 x 4644: 60p/50p/30p/25p/24p
  5392 x 3032: 60p/50p/30p/25p/24p
  4128 x 2322: 120p/100p/60p/50p/30p/25p/24p
  3840 x 2160: 120p/100p/60p/50p

Nikon writes: "The Z 8 can focus in candlelight during a first dance, yet is fast enough to freeze a falcon in flight. Like the Z 9, this new camera uses Nikon's most powerful and precise AF system, which has been developed with deep learning technology. The focus is immediately responsive and reliable, with enhanced Subject Detection capability for photo and video that recognizes humans, pets, birds, trains, cars, motorbikes and bicycles, and now various types of airplanes.

"Because of its reduced body size and internal recording, it's ideal for gimbal use, but also suitable as an A-camera."

"Internal 12-bit RAW footage can be captured as ProRes RAW 4K60p, or up to 8K60p in N-RAW, Nikon's RAW video format that is approximately a 50% smaller file size. N-RAW also creates a 1080p proxy file for easier editing.

"For more latitude with color, footage can be captured internally in 10-bit ProRes 4:2:2 HQ, while other profile options are available in-camera, including an enhanced N-Log, HLG as well as the easily gradable Flat color profile."

Stills

- Option to shoot 10-bit HEIF image files, a compressed file format similar to JPEG that is about equal in size but offers approximately one billion more colors.
- 14-bit RAW still file formats and a new HLG RAW option.
- Portrait Impression Balance function for precise control of skin tones, new Skin Softening function and improved white balance.
- Burst speeds range from 20 fps full res RAW+JPEG, 30 fps full-res JPEG, 60 fps DX-format JPEG, or up to 120 fps as 11 mp JPEG with High-Speed Frame Capture +.
- Wide, bright, blackout-free viewfinder— 1.27-cm/0.5-in. approx. 3690k-dot OLED EVF

3.2" 2100 dot horizontal and vertical tilting 4-axis touchscreen LCD, same as on Z 9.

- Image stabilization equivalent to 6 stops of compensation with compatible lenses.

More Details

- Two USB-C ports for charging (PD) and communication with accessories.
- Full-size HDMI port.
- Fully sealed and gasketed for dust and spray resistance. Body is made of a new pro-grade carbon fiber composite and magnesium alloy.
- Many customizable functions and buttons.
- The sensor cover glass has a dual coating to repel dust.
- A mechanical shield protects the sensor when changing lenses while the camera is turned off.
- Dual card slots: one CFexpress Type B / XQD and one SD.
- MB-N12 battery grip will be an optional accessory that provides approximately 1.8x more battery life, and is hot-swappable.

Price and Availability

The Nikon Z 8 will be available on May 25, 2023 for a suggested retail price of $3,999.95. The MB-N12 battery grip is available for an SRP of $349.95.

For more information: nikonusa.com.

Nanlux Evoke 900C

If you need a fixture a little less bright than Nanlux's Evoke 1200, or the new 2400B (just announced—draws ~2400 watts) and you want an RGBLAC six-color, fully tunable LED fixture, here's the new Nanlux Evoke 900C. Think of the "C" as "Color."

As the number in the name suggests, it draws about 940 Watts. Evoke 900C is the newest member of the Nanlux CoB (Chip on Board) family, a versatile series of LED fixtures that look like a cross between a spotlight and a still photography strobe. They call it a spotlight, but it excels in many ways: as an open face source, powerful hard-edge spotlight with various reflectors, shaped with an add-on Fresnel lens, projector attachments, and an assortment of round, octagonal and rectangular softbox modifiers. So, one fixture provides an even beam of hard or soft light, depending on how you accessorize it.

The Evoke 900C is extremely bright, putting out 12,940 lux at 3m (at 5600K, with 45° reflector) while consuming only 940W. You can plug it directly into a wall outlet. The fixture has an advanced RGBLAC six-color mixing system — with Lime, Amber and Cyan LEDs added to the primary RGB colors to achieve high color accuracy with CRI and TLCI rated at 96. Evoke 900C can accurately match almost any other light source on the market or let you crate almost any gel or color your set designer and DP might conjure up.

Evoke 900C has additional color modes: Advanced HSI mode, RGBW mode, XY coordinates and GEL mode. RGB (No Dimmer) mode is available for virtual production with DMX/RDM control. All color modes are accessible in all control methods.

In CCT mode, Evoke 900C is adjustable from 1800K to 20,000K and Green/Magenta can be tuned ±200. There's a 3.5-inch full-color display at the rear of the fixture with 4 buttons and 3 knobs and an intuitive UI. Evoke 900C can be controlled wirelessly or wired, including DMX/RDM, Art-Net/sACN, LumenRadio CRMX and the Nanlink App.

The power supply comes with a quick-release and can be mounted on a light stand or truss. A 7.5 meter power supply-to-head cable comes standard, with optional 10m and 12m cables available. Evoke 900C has adjustable fan speeds with four modes: Smart, High Full Speed, Low Speed and Off. Noise level is 25dBA with SMART mode.

As with other Evoke fixtures, reflectors, accessories and modifiers attach with the NL mount system. Evoke fixtures are also compatible with other accessories, including DoPchoice.

Evoke 900C can be controlled via Ethernet using Art-Net/sACN protocol for integration with Unreal Engine's lighting system. Lighting can respond to virtual environment changes in real time. As with other members of the Evoke family, the 900C head and power supply are IP55 rated to withstand spray, rain, dust and challenging weather conditions.

Nanlux Evoke 900C

Specs

Fixture:	Evoke 900C
Consumes - Power:	940W
Input Voltage/Current:	DC 48V / 18.75A Max AC 100-240V 50/60Hz
Dimming	0-100%, 0.1% increment
CRI	Average 96
TLCI	Average 96
CCT	1800K - 20,000K with Green / Magenta ±200
IP Rating	IP55
Control	On-board,Remote Controller, NANLINK APP, DMX/RDM, LumenRadio, CRMX,Art-Net/sACN, Wired Control
Effect	Hue Loop, CCT Loop, Int Loop, Flash, Pulse, Storm, Police Car, TV, Paparazzi, Candle/Fire, Disco, Bad Bulb, Fireworks, Explosion, Welding
Size, Light Fixture:	(without COB protective cap) 330×241×210 mm / 13.0×9.5×8.3”
Size, Power Supply:	146×125×344 mm / 5.7×4.9×13.5”
Weight, Light Fixture:	7.7 kg / 16.98 lb
Weight, Yoke:	1.84 kg / 4.06 lb
Weight, Power Supply:	4.5 kg / 9.92 lb

nanlux.com

Photometrics

CCT	at 3 meter distance	5 meters	7 meters
Light fixture only (open face, “bare bulb”)			
3200K	4250 lux / 395 fc	1656 lux / 154 fc	925 lux / 86 fc
4300K	4470 lux / 415 fc	1738 lux / 161 fc	973 lux / 90 fc
5600K	4341 lux / 403 fc	1688 lux / 157 fc	945 lux / 88 fc
With 26° Reflector			
3200K	39530 lux / 3672 fc	12300 lux / 1143 fc	6036 lux / 561 fc
4300K	41560 lux / 3861 fc	12940 lux / 1202 fc	6336 lux / 589 fc
5600K	40300 lux / 3744 fc	12560 lux / 1167 fc	6176 lux / 574 fc
With 45° Reflector			
3200K	12810 lux / 1190 fc	4404 lux / 409 fc	2266 lux / 211 fc
4300K	13500 lux / 1254 fc	4656 lux / 433 fc	2379 lux / 221 fc
5600K	12940 lux / 1202 fc	4501 lux / 418 fc	2305 lux / 214 fc
With 60° Reflector			
3200K	8240 lux / 765 fc	3038 lux / 282 fc	1642 lux / 153 fc
4300K	8565 lux / 796 fc	3201 lux / 297 fc	1734 lux / 161 fc
5600K	8541 lux / 793 fc	3110 lux / 289 fc	1693 lux / 157 fc
With FL-35YK Fresnel Lens at 11° Spot			
3200K	42540 lux / 3952 fc	15100 lux / 1403 fc	7898 lux / 734 fc
4300K	44650 lux / 4148 fc	15960 lux / 1483 fc	8303 lux / 771 fc
5600K	43270 lux / 4020 fc	15470 lux / 1437 fc	8056 lux / 748 fc
With FL-35YK Fresnel Lens at 45° Flood			
3200K	10160 lux / 944 fc	3820 lux / 355 fc	2057 lux / 191 fc
4300K	10740 lux / 998 fc	4001 lux / 372 fc	2168 lux / 201 fc
5600K	10420 lux / 968 fc	3923 lux / 364 fc	2108 lux / 196 fc

Matt Sakatani Roe, VENICE 2 Rialto and *Tonight We Ride*

Center: Matt Roe with Rialto camera head. At right: Ryan Wood. All BTS photos by Gonzalo Marroquin.

Matt Sakatani Roe is a cinematographer whose credits include *Purple Hearts*, *The God Committee, Nostalgia,* commercials, music videos and shorts. He grew up in Huntsville, Alabama. Studied finance in college,got involved in local news organizations, attended Maine workshops, summer at USC. Matt was the Director of Photography on Sony's recent T*onight We Ride.*

Jon: *Tonight We Ride* is beautiful. Tell us how it began.

Matt: *Tonight We Ride* was basically a collaboration of all my close friends from the last 15 years working and living in California. It felt like a student film project. One of my close collaborators, Ryan Wood, was the operator. His credits include *Moon Knight, Yellowstone, The Mosquito Coast,* and many other big projects. Ryan was also the writer because he and I have been planning to try to do something with rodeo for the last four years. He rides semi-professionally.

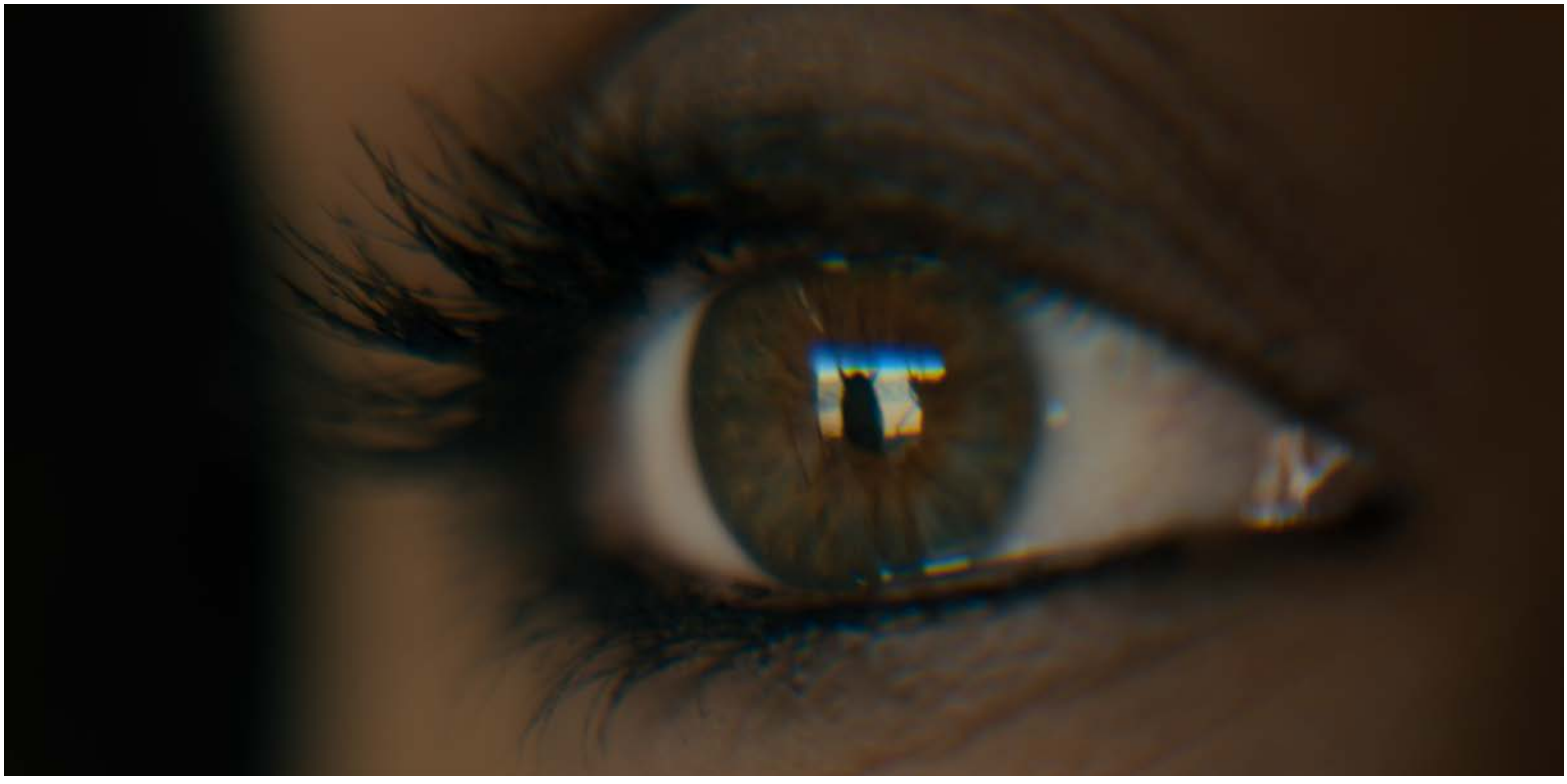
And then Tanya Lyon at Sony called and asked about doing a short showing off the virtues of the VENICE 2 Rialto. She said, "Try to break it." I think she was referring to dynamic range, high speed, push the sensor to its limits and see what it really can do. So, we rounded up the usual suspects, put the crew together, and planned the production. Key Grip Kyle Hudnall called his close friend at TCC (Telescopic Camera Cranes).

Actually, nothing broke. The camera and Rialto worked flawlessly.

It's a glorious, gorgeous camera and lens test. Mercifully without color charts and fairy lights, but rather an exciting story, day, night, dust, smoke, lots of action. On what setups was the VENICE 2 Rialto essential? And, just to play devil's advocate, what did the Rialto add that you couldn't have done just with a regular VENICE 2 body?

The Rialto can almost facilitate ergonomic function while you're on set. It's a device that gives you the opportunity to separate yourself from the normal mode of operating. It puts you in this action mode of wielding a camera device that's light and nimble. Ryan, the operator, has experience working with horses, how they work with human contact and eyesight. This is a professional rodeo horse that's only been ridden by the two people in his lifetime. Ryan, having worked with horses, was able to use the Rialto to maintain a visual line of sight with the horse while maneuvering around. The horse needs to stay in contact with the human face. If the camera blocks the operator's face, then the horse loses contact and it's unusual.

Professional horses on movie sets are used to cameras, but this was not a movie horse. In this scenario we needed flexibility. We



Above: Framegrabs from *Tonight We Ride.*

never really set up anything close to the horse. We just needed to be quick and have that freedom movement from high to low. The Rialto allowed us to put the lens underneath the horse's feet as he was getting re-shoed or right up next to the horse's eye. While Ryan maintained visual eye contact, he could get close to this extremely powerful animal that felt comfortable around us, while giving Ryan that visual freedom to adjust on the fly, because you can't really bring a Technocrane near a rodeo horse to get up high or down low. Ryan has done Yellowstone, so he has lots of experience around horses.

The camera body's in the backpack and the camera head has a tether that comes over the shoulder. Did somebody have to wrangle the cable?

We had it wrangled. Bradley Wilder, our first AC, whom I've worked with on many movies and shows, designed a well-

balanced backpack. You could adjust it vertically to find a balance point for Ryan's back. The tether looped around like a little satchel and went up to Ryan's arms. We had to a dolly grip spotting him, but we didn't necessarily need someone to wrangle the cable. It's like a backpack, but Ryan could have done a full sprint, stopped and turned right. It was complete freedom from the camera.

What lenses did you use?

The daytime scenes were Canon Rangefinder LTM (Leica Thread Mount M39) rehoused glass, primarily the 35mm and 50mm f/0.95. We used the Tribe7 20.7mm. We also had a Cooke Cinetal 25-250mm T3.7 MKIII. At nighttime, we transitioned to the new Cooke Varotal/i Full Frame zooms. I just bought them: 19-40, 30-95 and 85-215.

We also rotated between the 25-250 and also the 50mm LTM at night. There's one shot at the very end with a 50mm Cooke S8/i where she's embracing the horse .

So, we were just playing with modern, vintage, zooms and primes—all because we wanted to see what the sensor could do with them. How does the sensor perform with vintage optics? Seeing those imperfections? It still has a tonal roll-off that I find very pleasing. We didn't use any diffusion during the day on the lens. We used a Tiffen ⅛ Black Satin at night, primarily to get the lights to bloom and expand that halation, which has been something I've been a fan of—letting the lights pollute the blackness in the rear shadows.

What were your camera settings?

We recorded X-OCN ST. During the day, we kept the camera right around 800 ISO. Of course, the internal NDs helped us move fast as we adjust fthem. At night, we shot at 3,200 dual base ISO. Jill Bogdanowicz was the colorist at Company 3

Talk about lighting.

Within my lighting approach to the test, I wasn't going to be precious. I wanted to let the light illuminate the environment and let the subject fall in and out of the dynamic balance of how I would normally expose a scene. I didn't bring any diffusion, like 250 or Opal near the actors. I've done this before with the Venice, sometimes it's light a scene and let it go.

I've started to take the approach where I'm letting things just be a little more raw. Specifically on this test, whether the barn scenes, the daylight scenes, or the night scenes, I took a similar approach. I just wanted to see what the camera could do with harder edges, harder sources, farther back. How does the direct sunlight expose the skin? And it's extremely pleasing. It was important to me to try to push myself to learn in this test. I feel that I have more confidence to just be bold and not feel like you have to protect the camera sensor. In this case, the camera sensor is

Ryan Wood rides with VENICE 2 Rialto.

protecting you.

At night, Gaffer Jeffrey Marlowe set some HMIs and PAR lights all around the venue. And then we would just turn off the units where we wanted negative fill. We had hard sources. Occasionally, w used a Hudson Spider Mozzie LED light for fill.

We made sure to pamper the horse. He would get frustrated sometimes because that horse's one mission is to run around these barrels at full speed. When we asked the horse to knock over a barrel to show what a mistake would be in a rodeo, he was not happy. Because in a rodeo, if you knock over a barrel, that adds five seconds to your overall time. It takes you completely out of competition. The horse also knows that.

When we knock that barrel over with the rider's foot, the horse was extremely angry for the next 30 minutes. We actually had to stop filming because the horse took it extremely personally and we asked him to do it twice. The rider said, "I need a minute." She had to ride around, calm him down. He was bucking, puffing and not happy. He had to take a minute, go back to the trailer, recompose himself and then come back to set later.

Just like a diva. What was your biggest light?

It was a 4K HMI with one sheet of Opal, and arguably it was too much because of the 3,200 ISO. I can't remember how many times we scrimmed it down. All the stadium lights were existing, random practicals. We were concerned they were going to flicker. But I have a trick now on pre-production scouts: you hold up your iPhone at 120 frames per second, walk around and see if it's going to flicker.

At the lower end of the arena, on the railing, we installed Fiilex Q8s and Astera AX5 PSR fixtures. The Q8s could match the green cast of the stadium lights. So, we had a warm green mixed with blue.

The concept of the whole piece was not to just go out and make a rodeo piece of past and present. The underlying theme and idea behind the whole thing that Ryan and I talked about was about a big competition the next day. The idea plays out in a non-linear way in your mind as you're drifting off to sleep. You're imagining yourself at the competition of the ride. Then you're going back to your training. How did you learn to become in sync with your horse? Back in your past, how did you learn to become one with your horse? It's this highbrow theme of subconsciousness that ultimately became a different shoot, a different technique for a camera and lens test—in this case, a Sony VENICE 2 Rialto.

Tonight We Ride: youtu.be/913zLTXz9zk
Vintage lenses: Rare Breeds Camera, Culver City.
Production company: Goodform

Matt Sakatani Roe, VENICE 2 Rialto and *Tonight We Ride*

DJI Ronin 4D Flex

At NAB, DJI Senior Product Line Manager Paul Pan suggested trying the Ronin 4D Flex as one of the world's smallest Full Frame 6K camera remote heads.

And so Lucas, Prince of Darkness, rides again—so named for its 1992 vintage electrical system, Darkness by Lucas, "a gentleman does not go motoring about at night." And, "Never drive further than you care to walk home." Prince Lucas was harnessed as camera car with suspension so soft and fuel economy so thirsty it felt like a 2-mile starboard turn by the Exxon Valdez. Fitted only with a Super Clamp and a short length of Spectra sailing safety line, this is not a recommended setup—additional support points would be safer, better, more secure. But Prince Lucas did not stall and the 4D Flex recorded magnificently stabilized POV footage on potholed, puddled roads and soft sandy beaches.

The cable connecting camera and gimbal to the body and recorder is about 2 meters long. You can actually daisy-chain 2 or even 3 cables together. Note anything longer than 1 cable will disable the monitor signal. and 3 lengths stops the LiDAR focus system.

DJI Ronin 4D Flex Remote Head Setup

Camera Body, Onboard Monitor, Recorder

New 17-28 T3.0 Zoom Lens

Camera and Gimbal

High-Bright Remote Monitor with Cage and Handgrip Controls

Ben Affleck handheld with RED V-RAPTOR 8K VV and Angénieux Optimo Ultra Compact 28-76 zoom. Photo by Randy Wedick.

Jon Fauer: What cameras did you use on *Air*?

Ben Affleck: We had the ALEXA 35. I think we were the first or second movie to shoot with it. Chivo and Bruno Delbonnel used them on a series. But I think we were the first movie, and I remember we got three prototype bodies directly from ARRI.

There are photos of you with a RED V-RAPTOR. Is that your personal camera?

We used ARRI ALEXA 35 as the main cameras. I had a RED V-RAPTOR 8K VV with the new Angénieux Optimo Ultra Compact 28-76 T2.9 zoom lens. Bob Richardson, ASC had a set of custom prime lenses from Panavision. They were excellent. In order to integrate with those prime lens and to be at a level to satisfy Bob, I wanted to have a compact zoom that I could use to add to the look of the movie—to add a little bit of the kind of "captured look" of the movie. I used the V-RAPTOR because it's small enough so that when I wanted to get into certain places, I could handhold it with the Angénieux. So, there were "A," "B" and "C" ALEXA 35 cameras, and my V-RAPTOR was the "D" camera, effectively.

Part of the reason I had the Angénieux on the V-RAPTOR was because we started production before we could get all the ALEXA 35 bodies. So I tried using the V-RAPTOR and integrating it with the ALEXA 35. It was also interesting to see how to match the color spaces, which were mainly about the skin tones. We often go back and forth. It's become increasingly difficult to separate RED and ALEXA color spaces. There was a time when I felt they were more distinct. I think RED has really done a great job of approaching the skin tones. But ultimately, we went with the ALEXA 35 as our main cameras for our particular look on this movie.

The benefit for me using the V-RAPTOR was that I could just get in there. The way I operate is that Bob Richardson sets up two cameras. Obviously, he's brilliant. He's a genius. He finds where the shots should be. So inherently, by necessity, I have to be somewhere that you wouldn't normally put a camera.

Then I have to compose, within that space, a different kind of shot than you would typically see. I like to go handheld. Sometimes I'm racking focus, documentary style. I pull focus myself. The reason I like the Ultra Compact Zoom lens is because if I'm focusing myself, going to where my attention is. I'm not having to tell people which actor to focus on.

In the scene with Sonny (Matt Damon) and George Reveling (Marlon Wayans) in the bar, was that you racking focus from one to the other?

That was me, most of it. There was some rack focusing in there. As an actor, I often find myself actually liking my off-camera work a little bit better because I'm more relaxed. Especially early on—maybe the first day—I'll often just go and shoot. I filmed both Matt and Marlon during the other person's close-up. It was essentially having them in the foreground—not a close-up single, but pulling to them from the foreground. Often, there's something about the relaxation that you feel when you just don't think you're on camera. It actually gets a little bit looser, sometimes a little ad lib. Maybe it's just me, but I always feel like, "Gosh, I should have done it like that when I was on camera." There's just an extra degree of relaxation, so I don't want to miss that.

Ben Affleck with RED V-RAPTOR 8K VV and Angénieux Optimo Ultra Compact 28-76 zoom. Photo by Ana Carballosa.

Obviously, on [analog] film, you wouldn't have been able to do that for obvious reasons. Now, in digital, it's really more about the quality of light. You're often working at much lower light levels now. It means that you can get in interesting places. And it really becomes about composition in a lot of ways. I wouldn't shoot something where Bob doesn't agree. I always say to Bob, "Anything that I get, if you don't like it, you can throw it away. I am not the cinematographer; you are by a whole long way. Bob is, I think, one of the greatest ever. It's a real honor that he kind of tolerated my additional shooting.

Having those moments of performance, "caught moments," or getting over Matt's arm and shoulder, just makes it feel a little bit less like a movie to me. It's kind of half captured and thrown away. I feel that it adds to the authenticity. Not all movies can absorb that. But also, I thought it was an interesting complement to the formality of what Bob does. He can't help but be masterful. I hate to say it, but a little touch of a much less skilled operator in small doses actually flavors the film in an interesting way. I would never be an "A" or "B" camera operator where my job is to make sure to compose properly every time because I couldn't be relied on to do it. I'd be doing the actor a disservice because I might have missed a great performance. That's a problem.

I'll catch inserts, I'll get a beer glass filling, the food, environmental cutaways, or stuff in the office. All of that helps fill out a movie where you spend so much more time if you have to go set up for the inserts, and then the entire company stands around while you shoot the sole of a shoe. Whereas, I would just stand there and grab it and the crew might be walking in front of the camera, and I'm just shooting away. I find it very efficient. Also, I don't have to explain the kind of inserts I want or the way to do it, or start here and rack focus to that.

However, sometimes I do want a very specific kind of insert, for example, when Sonny is in the room at night in the office. You have all those little library type bankers' lamps on the tables, which was a cheat that I just allowed ourselves to have because I thought they were pretty.

Were you mixing Super 35 from Bob's ALEXA 35 camera and Full frame on your V-RAPTOR VV?

No, because we matched formats and the RED sensor mode was cropped to match the size of the ALEXA 35.

Oh, you were in Super35 for all cameras?

Yes. So that it remained consistent. You want to have the same framing. Otherwise it can become awkward. We had a brilliant colorist, Élodie Ichter at Picture Shop. She is a genius. She did magical things integrating the RED footage with the ALEXA. Bob found her and I see why, because she's amazing. She was able to beautifully apply the LUT and apply grain specifically to the red, green, and blue components of the image. Because with original film stock, of course, the red, green and the blue layers had different degrees of photosensitivity.

Were you always interested in cameras and lenses?

Yes. I've been a photographer since high school and I've always loved it. It's in my blood. I'm always taking photographs. I have amazing Super8 footage of shooting *Good Will Hunting*.

Ben Affleck with his Beaulieu Super 8mm and Angénieux zoom. Photo: Randy Wedick.

My brother and I took a 16mm camera across the country. I've always loved film and photography. The great joy now is our new company, Artists Equity. The idea is equity and ownership. I own the company but don't take a salary. I'm aligned with the company's interests and this is a symbol of how we want how artists to be compensated. But our real secret salary is that we mostly own our own gear. We buy the lenses, the bodies and then rent them back to the production. But it's really just so that I can expand my collection. The Angénieux Ultra Compact zoom is an example. I won't mention any other specific lenses.

Feel free. FDTimes is equal equipment opportunity and our logo color is Swiss Army Knife neutrality.

Well, over the the years I have accumulated a collection of vintage lenses that I bring to the company. Because, as the cameras get more resolution, there can be a crispness veering towards football game or a newscast video that works against the combination of old glass and the motion blur of film, which gave you a bit of a distance. I think it helps suspend disbelief. I don't think that resolution itself is bad because if it's well lit, the resolution can actually give you smoother details and pleasing fall-off.

I have a set of Canon K35s that are rehoused. They are unbelievable. I have ZEISS Ultra Primes and Super Speeds. I have some old ARRI/FUJINON Alura Zooms and crazy Russian lenses from the '50s that I got off eBay.

Amazing. I had no idea you were a member of our camera and lens geek society.

Man, I get made fun of. It's a very serious addiction.

Why are others not doing this—sort of going back to the days when the studios and production companies had in-house camera departments and owned the equipment?

I don't know why not. I think that stopped once the studios got broken up. But still, we work with rental houses. We're not looking to put rental houses out of business because there's always something somebody wants to rent. In particular, the camera bodies.

This will continue to bud. You buy one and then the next one. ALEXA, V-RAPTOR, VENICE 2 are great, and there'll be another. They're always innovating. But the glass is something worth collecting. Look at Panavision. Some of the lenses we used for Air are from *Ben-Hur*. They have some beautiful glass. The age and quality of the glass does have an effect. Vintage lenses can be especially good in Full Frame format with its high resolution 8K. I just love it. It's definitely compulsive.

We also own all our post production equipment. Even post here is in-house. It allows us to offer the means for artists on limited budgets to really try to do it for less. We go, "Here, take the gear. Here are the cameras, the lenses, the stuff."

When we were doing *Good Will Hunting*, the logic was, well, you needed a million dollars just for a camera body and film. It was about 60 cents a foot to buy the film, 60 cents to process, and then the cost of the workprint. And lots of lights just to get an exposure. These were hard costs. Now, I feel that if we give you a camera and lens, you should be able to make a movie. That's why I'm really grateful to have that Angénieux Optimo Ultra Compact zoom. I love it—it's really the best handheld zoom for me. If you want to be most versatile and still have something that can cut with the most elegant glass, you really cannot do better than that.

What did Bob Richardson ultimately think about your having a different lens than the Panavision lenses he was using?

I'm very respectful and deferential. I only know enough about photography to know how much better Bob is than I.

But it cut well. Vintage Panavision primes and a contemporary Angénieux zoom worked well together.

They did. Bob knew that I was respectful of it, that I understood how he was lighting and understood the look and was not going to violate it. I also knew that he was looking at it and grading it. If there was something he had a problem with, he could, obviously, mark it and grade it, or get rid of it. Bob was grading as we went along on the set. Of course, there was a show LUT. But, we had a physical grading suite on set where he worked with the colorist as we were shooting, which was extremely useful.

I think, probably, in his heart of hearts, Bob would have liked a more professional operator than me since he is used to working with the very best. I'm no Colin Anderson [Camera Operator on Air], that's for sure. And I'm not as good as Bob. But I am good enough that some of the stuff can end up in the movie and, as I said, I know enough to appreciate how much work goes into being a great cinematographer like Bob.

There was a nice immediacy that you also had in "Argo."

Yeah. That was another movie where we used all kinds of cameras and lenses—anamorphic, spherical, film bodies, ALEXA, Super8. We used almost every format you can shoot in, each distinct to a certain location—the CIA, Iran, Turkey, Hollywood. They all had different looks, lenses, bodies and style. They gave you a sense of different worlds, hopefully.

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